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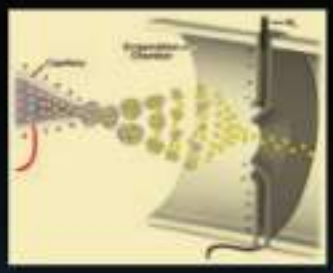

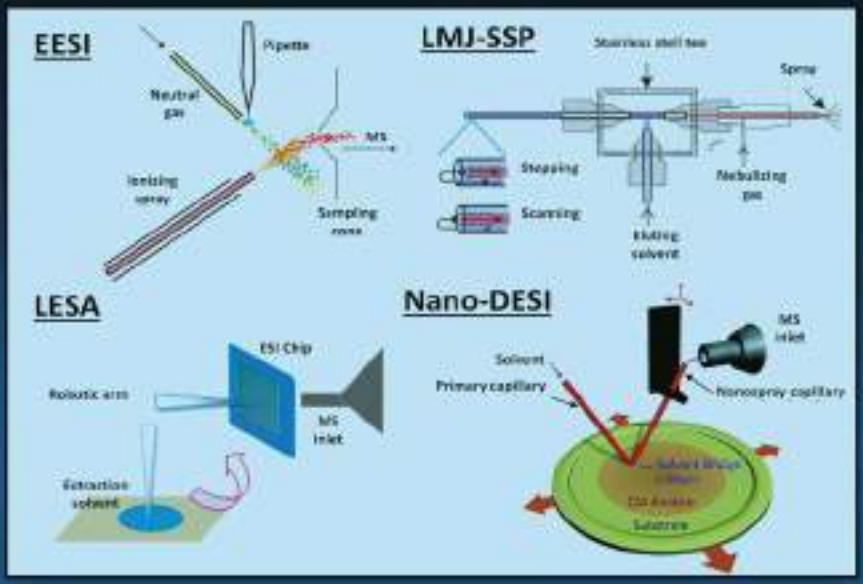

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A Survey of Tasks Scheduling Algorithms in Distributed Computing Systems

Nutan Kumari Chauhan (KIET Group of Institutions, India) and Harendra Kumar (Gurukula Kangri Vishwavidyalaya, India)

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Abstract

Distributed computing system (DCS) is a very popular field of computer science. DCS consists of various computers (processors) located at possibly different sites and connected by a communication link in such a manner that it appears as one system to the user. Tasks scheduling is a very interesting field of research in DCS. The main objectives of tasks scheduling problems are load balancing of processors, maximization of system reliability, minimizing the system cost, and minimizing the response time. Obviously, it is very complicated to satisfy all of the above objectives simultaneously. So, most of the researchers have solved the tasks scheduling problem with one or more objectives. The purpose of this chapter is to produce an overview of much (certainly not all) of tasks scheduling algorithms. The chapter is covering the little much valuable survey, tasks scheduling strategies, and different approaches used for tasks scheduling with one or more objectives.

Chapter Preview

Top

Introduction

There are various causes for using DCS. The nature of equipment may involve the utilization of a communication network which connected by some computers: for eg, data created in one site and needed in another site. There are various cases in which only one computer is required, but DCS is very helpful for practical causes. For eg., it may be extra cost-efficient to get the inclined level of performance by applying cluster of numerous low-end computers, in similarity with only high-end computer. DCS has no

Published Online: 09 August 2019

Fabrication and characterization of $Cd_{0.98}Zn_{0.02}O$ film by inventive sol-gel screen-printing technique

AIP Conference Proceedings **2136**, 040014 (2019); https://doi.org/10.1063/1.5120928

Renu Kumari[1,*] *and* Vipin Kumar[1]

View Affiliations

Mathematical Analysis of oxygen Transport in the Retina

Deepti Seth All Authors

Abstract: The aim of the present work was to simulate the oxygenation of the whole retina under normal conditions as well as during retinal ischemia. A differential equation descri... **View more**

▸ Metadata

Abstract:
The aim of the present work was to simulate the oxygenation of the whole retina under normal conditions as well as during retinal ischemia. A differential equation describing how oxygen is transported from blood to tissue, diffuses through the tissue and is consumed according to Michaelis-Menten kinetics was constructed. The outer retina was divided into three regions of which one was set to have consumption. The inner retina was considered as one uniform region with respect to maximal rate of oxygen consumption and blood flow. The results suggest that extreme hyperoxia would be needed to make the choroid capable of supplying the whole retina during total retinal artery occlusion and moreover confirm that light might to some extent be beneficial.

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Deepti Seth
Krishna Institute of Engg. & Technology, Ghaziabad

Contents

Introduction:
Retina is tissue layer at the back of the eye that responsible for light detection. Retinas generated by many layers of photoreceptor and nerve cells. The mathematical models used dates have reflected the dual nature of the oxygen supply to the retina in most mammals [1]. The retina receives its oxygen supply exclusively from the Choroid. In applying existing oxygen supply and consumption models to these data, we realized that the total dependency on chorodidal approach oxygen delivery allowed a modified for approach to the mathematical analysis.

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Figures

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Keywords

Metrics

EasyChair Preprint

№ 4147

Effect of Water Temperature on the Compressive Strength of Silica Fumes based Porous Concrete

Aniket Kumar Sharma, Shobhit Pandey, Ayush Jain and Shreya Shekhar

September 7, 2020

Effect of Water Temperature on the Compressive Strength of Silica Fumes based Porous Concrete

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***Abstract*— Pervious concrete is a zero droop solid, which comprises of coarse aggregates, water and different cementitious materials. As there is no fine utilized in the concrete so it's at some point referred as no-Fine concrete. Also pertaining to its water draining capacity it is also known as called permeable concrete. Pervious concrete is special kind of high porosity solid which permits water from precipitation to either infiltrate into the ground water or to the other storage facility. Since it provides better friction to vehicle tyres and hence also prevents skidding. It utilized for asphalt since it gives a genuine presentation against sliding for vehicles in stormy days and a far superior sound retention property.In this examination the concrete supplanted with silica fumes with different mixing water temperature were tested, so as to arrive at an optimum level of workability and strength. Concrete Blocks of Standard Sizes were prepared and relieved at a standard time period of 7, 14 and 28 days and then the compressive strength was tested. Distinctive solid blend extents, for example, OPC and SPC are set up to the check the compressive quality of pervious concrete. The outcomes show the Pervious Concrete containing 5%,10%,15% silica smoke can accomplish compressive quality of 14.4 N/mm2, 17 N/mm2, 19.1 N/mm2 for 28 days of relieving individually and at low mixing water temperature 10^0c the workability and slum value enhances. With addition of more silica fume in mixer the value of permeability was decreasing.**

Keywords—OPC(ordinary pervious concrete); SPC(silica fume pervious concrete);PC(pervious concrete)

INTRODUCTION

Pervious concrete is a specific kind of high porosity concrete. Due to presence of voids, the required interlocking is not achieved and its strength is less than conventional concrete. However It can be used in areas of low traffic and high rainfall accounting for its permeability. When mixed with asphalt, it also provides better protection against skidding of vehicles. However it is difficult to work with as no fine aggregates are present, Also durability of this type of concrete can be put into question. To encounter the solution, Pozzolanic materials like silica fumes can be added to increase the mechanical properties and strength. Different mixing water temperature also has an effect of workability and strength [1]. Countries like India have seasonal characteristics; hence the temperature of the aggregates as well as water can vary with seasons. Hence this study was carried out to check the compressive strength, workability and permeability of the porous concrete in the presence of silica fumes with different mixing water temperatures. Silica fume is a byproduct resulting from the reduction of pure quality of quartz with coal or coke and wood chips in electric arc furnace during the production of silicon metal or silicon alloy. The use of silica fume is desirable as it enhances the durability of the concrete. There are differences among researchers on how workability is affected after addition of silica fumes as a cement replacement. Strength and Wear Resistance of Sand -Replaced Silica Fume Concrete Hamidou and gafoori 2007 [2], Compressive quality of 10% SF supplanted pervious concrete expanded around 30%. but the wanted porosity was not accomplished so ideal level of silica fume for 20% porosity was 8% [3], Khayat investigate that Blended silica fumes also contribute to increased strength, cohesiveness and enhancing scaling resistance. It also have a diminishing effect on permeability [4], Kadri and Dual reported that workability is increased when silica fumes is added as an replacement to the cement [5], Vikas have discovered that an ideal degree of silica fume expanded strength is around 5% by weight. Anyway beyond that there is a misfortune in compressive quality anyway the workability is seen as expanded [6] . The experiment was done on OPC and SPC with varying water temperatures as 10 degrees and 25 degrees. A fixed water cement ratio i.e. 0.33 was used in all the experiment with variation of silica fumes as 5% 10 % and 15 % of the total cementitious materials. In the end, the permeability of the attained concrete after 28 days was tested .This paper presents the results of this investigation.

MATERIALS

SILICA FUME: It is a side-effect accomplished by gathering fumes gas essentially of non-crystalline silicon dioxide (SiO2), and the normal molecule distance across of every essential molecule is around 0.1 to 1.0 μm. By including the superfine particles of silica smoke to solidify and different materials, the holes between the particles are filled. This impact picked up the creation of thick, high-quality items.

EasyChair Preprint

№ 4694

Land Use Land Cover Dynamics in Indore District Using Remote Sensing and GIS

Pranshu Tiwari, Shreya Shekhar and Ayush Jain

December 3, 2020

LAND USE LAND COVER DYNAMICS IN INDORE DISTRICT USING REMOTE SENSING AND GIS

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ABSTRACT: The city/district of Indore is located on the south edge of Malwa plateau in the Madhya Pradesh state of India. The objective of this study is to follow the change in the dynamics of land use and land cover in the Indore District from 1998 to 2019. The study was conducted using the multi-spectral satellite image. It is based on the pixel-based unsupervised classification of Landsat satellite images of the year 1998, 2009, and 2019 using ArcGIS pro. The unsupervised classification of an image using Arcgis pro gives the ability to support image classification without the requirement of the training sample which reduces processing time and cost, but it has low accuracy which can be reduced by reclassification methods supervised by visual comparison of classified images with their false-color composites(FCC) image in different spectral band combinations. The results obtained showed a negative overall variation of the types of occupation of the territory of our study area. Thus, over this period, the study showed an increase in the areas of the urban agglomerations, bare mountain, and crop and/or grassland and water classes by 4.483% to 11.493%, 5.336% to 19.936%, 65.075% to 66.850%, 1.503% to 2.042% respectively, in addition, there is a decrease in the area of vegetation from 8.371% to 2.026% of the overall area. The Anthropogenic activities due to rapid urbanization, industrialization, and migration and population growth contribute substantially to this situation.

KEYWORDS:
Land use land cover dynamics; Remote sensing; unsupervised classification; Indore district; GIS; ArcGIS pro; climate change.

1. INTRODUCTION
Land and water resource degradation are the major problems in the Indian sub-continental region. The increase in the human population intensifies the utilisation of land resource that puts a significant load on the ecosystem and environment. Poor land practices and their management by concerned authorities' results in the loss of productivity, loss of organic rich matters and nitrogen enrichment on the top layers of soils which decrease the overall productivity of the crop in the region. Since the economic reformation in India dynamics of land use has changed significantly, the acceleration of urbanization and industrialization under this process has led to serious ecological destruction [1].

Indore district is one of the major districts of India in terms of population and economy in the central Indian region. It comes under India's tier-2 cities which make it one of the first cities which are going through India's "smart city mission" program. Under these programs major investment would come, expansion of urban agglomeration and transportation has to be done like metro railway and grand townships. But nothing has come without sacrifices due to this

"A Literature Review on Solid Waste Management: Characteristics, Techniques, Environmental Impacts and Health Effects in Aligarh City", Uttar Pradesh, India"

Harit Priyadarshi[1(✉)], Sarv Priya[2], Ashish Jain[1], and Shadab Khursheed[3]

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Abstract. India is known as one of the most heavily settled countries in the world. It appears to be the second country to have the highest number of residents. With the total population of about expected data 1.37 billion in 2019. The management of Municipal Solid Waste (MSW) in India has encountered problems. Each year, the population grew by 3–3.5%, as this factor arises, the rate of solid waste generation also rise up to 1.3% in Aligarh city, Uttar Pradesh a large number of ingenious factors like, rapid urbanization, rapid population density, rapid commercialization, uneven living standards and also enlargement of industrialization has created destructive consequences in terms of biodegradable and non-biodegradable waste generations which are estimated at about 415 tons per day.

This paper emphasizes the waste characteristics, techniques, adverse environmental impacts, health risks, poor waste management practices and also problems associated with the solid waste management system at the municipal level.

The findings from this study indicates failure of the existing facilities due to lack of concern, high volume of waste generation, deficient collection space, delayed sanctioning of new landfill sites and a number of open-dump sites which generate fires. The innuendos of the waste management practices in the city are discussed.

Keywords: Sources of M.S.W · Component of M.S.W · Health risks and sustainable approaches

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Lecture Notes in Civil Engineering

Sirajuddin Ahmed
S. M. Abbas
Hina Zia *Editors*

Smart Cities—Opportunities and Challenges

Select Proceedings of ICSC 2019

Springer

A Study on Modelled Granular Column of Various Diameters in Soils

Ankush Chaudhary, Rahul Siddarth, A. K. Sahu and S. M. Abbas

Abstract In order to develop a smart city, the role of smart transportation infrastructure system is essential, which will improve the ability to connect and improve the quality of human being by saving time and energy. In the present paper, an attempt has been made to improve the soil for the construction of smart structures. In the present paper, the aim is to study the variation of load carrying capacity and shear parameters of soil after introducing granular columns of varying diameter. Results show that the granular columns derive the strength from the soil confining them. The granular columns also help in easy drainage and reduction in pore pressure. A series of CBR and direct shear test were performed after the installation of granular columns at the centre of the specimen by varying the diameter in the soil where it was found that there was an improvement in load carrying capacity and shear strength parameters of the soil. The study also presents swelling behaviour of soil against time.

Keywords Soil · Granular columns · Stone dust · Direct shear test · BCS · CBR test · OMC · MDD

1 Introduction

Smart cities may be considered as a community that uses the advanced technology and information to improve the infrastructures for the betterment of human being which not only increases the safety but a strong and sustainable infrastructure can be made.

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Column operations for sorption of chromium and lead from aqueous solution using industrial wastes

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Abstract

The rotary kiln waste (dolochar) generated in sponge iron plants has been converted into a low-cost adsorbent by heat activation for the removal of chromium and lead from aqueous solution. The effects of pH, sorbent dosage, adsorbate concentration, temperature, and contact time on the sorption of both the metal ions were studied in batch experiments. Kinetic studies were also conducted to have an idea on the sorption mechanism of the process. The uptake of lead was found to be more than that of chromium. Adsorption on dolochar followed Freundlich isotherm. The kinetics of the Cr (VI) and Pb (II) adsorption on the kiln waste was found to follow a pseudo second-order rate equation. It was observed that the sorption process was spontaneous and adsorbents is suitable for sorption of Pb(II) and Cr(VI). In addition, fixed-bed studies were performed to simulate real-life conditions. The experiments were also performed to regenerate the column by 0.2N HNO_3 for lead-dolochar system and 0.5M NaOH for chromium-dolochar system for reuse.

Key Words: Adsorption; Dolochar; Isotherms; Column study; Breakthrough curve

1. Introduction

Water pollution due to toxic heavy metals such as chromium, lead, manganese, copper, iron, zinc etc has been a major cause of concern for the society. Among these heavy metals, chromium and lead are toxic metals found in several industrial discharges and effluents (Dubey and Gopal 2007). Chromium is harmful heavy metal ion which exists in hexavalent and trivalent forms. The permissible limits of Cr (VI) and Pb (II) in industrial effluents are stipulated 0.5 mg/l and 0.1 mg/l respectively by the environment protection agency in India. But, these metal ions in the mining and industrial effluents are often found to be more than the permissible limits (De Filippis and Pallaghy 1994). Safe disposal of heavy metal contaminated wastewater is a challenging task due to the fact that techno-enviro-cost-effective feasible treatments are scanty (Weng et al., 1994). Although number of methods such as ion exchange, reverse osmosis, precipitation, and adsorption etc. exist to remove these toxic metal ions from industrial effluents, the literature survey suggest that most versatile and widely method is the method of adsorption. Activated carbon has been a standard adsorbent for removal of heavy metals from industrial wastewaters since long (Fornwalt 1966) despite being an expensive material. In last few decades, the researchers have shown lot of interest to develop low-cost adsorbents as a substitute to activated carbon.

2. Material and methods

This study was conducted in the Environmental Engineering Laboratory, Department of Civil Engineering, Veer Surendra Sai University of Technology Odisha in 2015-16. The details of materials and methods of the study are as follows;

EFFECT AND OPTIMISATION OF MICRO SILICA ON HIGH GRADE STRENGTH OF CONCRETE

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ABSTRACT

Concrete is one of the most important engineering material and the addition of some other materials may change the properties of concrete. With increase in trend towards the wider use of concrete for prestressed concrete and high rise buildings there is a growing demand of concrete with higher compressive strength. Mineral additions which are also known as mineral admixtures have been used with cements for many years. There are two types of materials crystalline and non-crystalline. Micro silica or silica fume is very fine non crystalline material. Silica fume is produced in electric arc furnace as a by-product of the production of elemental silicones or alloys containing silicon. It is usually a grey colored powder somewhat similar to Portland or some fly ashes silica fume is generally categorized as a supplementary cementitious material. Silica fume or micro silica was initially vied as cement replacement material and in some area it is usually used as replaced by much smaller quantity of silica fume micro silica may be used as pozzolanic admixtures. Admixture is defined as a material other than cement water and aggregate that is used as ingredient of concrete and is added to the batch immediately before or during mixing. Pozzolanic admixtures are siliceous or aluminous material which is themselves possess little or no cementitious value but will in finely divided form and in the presence of water chemically react with calcium hydroxide liberated on hydration at ordinary temperature to form compounds possessing cementitious properties. In our experiment we are going to use micro silica as an artificial pozzolans. We are going to add 0%, 5%, 10%, 15% by weight of cement in concrete.

Keywords: Cementitious, Concrete, Crystalline, Micro silica, Pozzolanic admixtures, Strength

1. INTRODUCTION

Concrete is a most widely used building material which is a mixture of cement, sand, coarse aggregate and water. It can be used for construction of multistory buildings, dams, road pavement, tanks, offshore structures, canal lining. The process of selecting suitable ingredients of concrete and determining their relative amount with the objective of producing a concrete of the required strength durability and workability as economically as possible is termed the concrete mix design. Nowadays engineers and scientists are trying to increase the strength of concrete by adding the some other cheap and waste material as a partial replacement of cement or as a admixture fly ash, micro silica, steel slag etc. are the few examples of these types of materials. These materials are generally by-products from other industries for example fly ash is a waste product from power plants and silica fume is a by-product resulting from reduction of high purity quartz with coal or coke and wood chips in an electric arc furnace during production of silicon metal or ferrosilicon alloys. Nowadays whole world is facing a major problem of environmental pollution these materials fly ash micro silica, steel slag may become a major pollution material. Micro Silica is one of the materials used to reduce the amount of cement in concrete because of the expenses of cement but since the price of this material has increased in most of the countries it is not economical to apply it as a supersede of cement. Silica is more usual these days as an additional material to obtain special properties of concrete. Micro silica is one of the most active materials among all pozzolanic materials. We can reach to pozzolanic properties sooner in Micro silica than other pozzolanic

INTELLIGENT TRANSPORTATION SYSTEM IN INDIA

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Siddharth Jain *(Assistant Professor of Civil engineering, KIET Group of Institutions, Ghaziabad, U.P. INDIA)*

Abstract

Idea of ***Intelligent transport system*** comes from problem caused by ***traffic congestion***. Due to rapid vehicular growth with increasing population, rural to urban and economic upsurge has put immense pressure on transportation system in INDIA. *Traffic congestion reduces efficiency, increases travel time, causes air pollution and increases fuel consumption*. Due to development in transportation network it also leads to increase in number of road accidents all over India. This paper, attempts to understand the application of INTELLIGENT TRANSPORTATION SYSTEM (ITS) as a solution of present traffic congestion problem and how to decrease road accidents by the use of technology.

This paper will also explain various ITS applications and policy measures in India context and a brief about the issuses and challenges of ITS in INDIA.

KEY WORDS : Intelligent transportation system, Traffic congestion, Fuel consumption, To reduce road accidents, Probe and smart vehicles, Sensing technology, Wireless communications, Video vehicle detection, Emergency management system, GIS, safety in public as well as private vehicles.

1. Introduction

Worlds population is increasing at a high rate and simultaneously the world economy is also growing. Hence people are used to have greater mobility and when it comes to transportation, Road movement is considered to be most convient and easy to everyone. There is no doubt in higher the people using the transportation system more will be the road accidents hence there is a requirement of proper transportation system which can handel a larger mass of people on wheels safely and it is make sure it should be envoirment friendly as well. World wide various organizations are working on this problem and it is first setup in 1991 by US Department of Transportation. Vehicle to vehicle communication, vehicle to infrastructure communication, electronic toll collection are some of the very popular projects undergoing worldwide. When it comes to the developing countries like India, Intelligent Transportation System is very helpul. Each nation whether developed or developing, when implement the intelligent technologies the surface transportation system will be safest, economical and last but not the least Environment friendly.

2. Overview

Intelligent transport system is one of the best method to simply or minimize traffic problems. The main aim of ITS is to achieving traffic efficiency, reducing traffic congestion, to control environmental degradation, energy conservation, reducing travel time, safety of passenger, increase travel comfort with the help of information and communication technologies. Its covers all modes of transport and considers all elements of the transportation systems like vehicle, infrastructure, and the driver or user, interacting together dynamically. The overall application of ITS is to collect data, analysis of that data and use that analysis data into operational, control and research concept for traffic management.

Physico-Chemical Analysis of Groundwater in Iglas and Beswan, Aligarh District, Uttar Pradesh, India

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Abstract. Iglas and Beswan are the towns in Aligarh district in of Uttar Pradesh, India. These are located along Aligarh- Mathura high way at 24 km from Aligarh. These are located at 27°43′ N 77°56′ E. It has an average elevation of 178 m. The town area extends from Karban River (towards Mathura) to old Canal (towards Aligarh). In the present study Groundwater samples were collected from Iglas and Beswan town. The samples were collected without any air bubbles. These bottles were rinsed before collection of water samples which are sealed labelled and transported for Laboratory analysis. The dissolved oxygen was measured in situ.

Results showed that pH level in the study area was 7.10 in Iglas and 7.79 in Beswan. The total alkalinity 476 mg/L in Iglas and 350 mg/L in Beswan. Similarly total hardness was 570 mg/L in Iglas, and 210 mg/L in Beswan. The concentration of calcium was 82.50 mg/L in Iglas, and 120 mg/L in Beswan, Magnesium concentration was 145.50 mg/L in Iglas and 90 mg/L in Beswan. Conversely turbidity 0.31 mg/L in Iglas and 0.84 mg/L in Beswan. The concentration of chloride was 52 mg/L in Iglas and 368 mg/L in Beswan are respectively. Overall, the results showed that groundwater sources in Iglas and Beswan are suitable for drinking, except for high Cl in Iglas. Although, no health based guideline value is suggested for Cl in drinking water. Cl concentrations above 250 mg/L can give rise to detectable taste in water. This study has shown that Groundwater is comparatively suitable for drinking. However, broader studies evaluating Groundwater over wider spatial and temporal scales are recommended, since this analysis was based on few parameters and limited spatial scale.

Keywords: Physico-chemical parameters · Water quality · Human consumption

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Review paper-Effect of crumb rubber tyre in conventional concrete

Nitesh Bhardwaj, Mohd Sharique, Rajat jain, Kunal gupta, Mohd Fahad, Sadique Khan

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Abstract

Disposal of waste tyre rubber has become a major environmental issue in all parts of the world representing a very serious threat to the ecology. One of the possible solutions for the use of scrap tyre rubber is to incorporate it into concrete, to replace some of the natural aggregate. The paper evaluates the influence of the rubber powder on material characteristics and durability of CRC. CRCs with various contents of fine and coarse crumb powder were compared. The tested parameters were slump, air content, permeability, resistance of concrete to water with deicing chemicals, compressive and splitting tensile strength. The tests showed that workability, compressive strength and permeability decreased as the amount of rubber increased, but the air content increased as the rubber content increased. Photos of air voids in cement matrix from electron microscope were captured (SEM is a type of electron microscope that produces images of a sample by scanning the surface with a focused beam of electrons. The electrons interact with atoms in the sample, producing various signals that contain information about the surface topography and composition of the sample.) The results of laboratory tests showed that admixture of rubber powder in concrete could have a positive impact on durability of concrete and concurrently contribute to sustainable development. Considering the lower compressive strength, CRC is recommended for use in applications where the high strength of concrete is not required.

Keywords **:***Aggregates, Compressive strength, Crumb tyre, Flexural strength, Tensile strength, Weight loss.*

1.Introduction

The vehicle tyres which are disposed to landfills constitute one important part of solid waste. Stockpiled tyres also present many types of, health, environmental and economic risks through air, water and soil pollution. The tyres store water for a long period because of its particular shape and impermeable nature providing a breeding habitat for mosquitoes and various pests [1–3] .Tyre burning, which was the easiest and cheapest method of disposal, causes serious fire hazards [4]. In addition, the residue powder left after burning pollutes the soil.

An estimated 1000 million tyres reach the end of their useful lives every year [1]. At present enormous quantities of tyres are already stockpiled (whole tyre) or landfilled (shredded tyre), 3000 millions inside EU and 1000 millions in the US [2]. By the year 2030 the number of tyres from motor vehicles is expect to reach 1200 million representing almost 5000 millions tyres to be discarded in a regular basis. Tyre landfilling is responsible for a serious ecological threat. Mainly waste tyres disposal areas contribute to the reduction of biodiversity also the tyres hold toxic and soluble components [3]. Secondly although waste tyres are difficult to ignite this risk is always present. Once tyres start to burn down due to accidental cause's high temperature take place and toxic fumes are generated [4] besides the high temperature causes tyres to melt, thus producing oil that will contaminate soil and water.

Crumb rubber of different sizes

ROLE OF CIVIL ENGINEERS IN GREEN BUILDING

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Abstract:- *There are three Green Building Rating system operational in India. Although it is considered that design and development of Green Buildings are Architects, Mechanical and Electrical Engineers job. It is the Civil Engineers create need and chose site for Building. They are involved all the phases of building from planning, execution ,maintenance,addition alteration and disposal of building. Apart of aesthetics and comfort creation by electro-mechanical means it is the civil engineering profession who recognizes the reality of limited natural resources and directly responsible for strength and durability of buildings. This paper discusses a framework of green building rating systems and civil engineering role in it. By providing a better understanding of Green Buildings, civil engineers can provide proactive solution to competitive global infrastructures.*

KEYWORDS: *Sustainable construction, civil engineering, green buildings, Sustainable development.*

Introduction

Globally, the construction industry is one of the main contributors to the depletion of natural resources and a major cause of unwanted side effects such as air and water pollution, solid waste, deforestation, health hazards, global warming, and other negative consequences.

In order to stay competitive and to meet upcoming stricter environmental regulations and customer requirements, designers have a key role in designing civil infrastructure so that it is environmentally sustainable. These and other factors have compelled the engineer to design with greater care and in more detail. The changing roles of engineers will be highlighted, in order to react to changes in climate.

Conventionally the prime focus of a civil engineer is building strength and lifespan, but with present changing scenario , awareness and responsibility toward environment the characterization of civil engineer has changed from “The one who directs nature great power source to convenience and use of man” to “the guardians of built and natural environment” (Ochsendorf, 2005).

A **sustainable building**, or **green building** is an outcome of a design which focuses on increasing the efficiency of resource use — energy, water, and materials — while reducing building impacts on human health and the environment during the building's lifecycle, through better sitting, design, construction, operation, maintenance, and removal. Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation

The `Green Building' concept is gaining importance in various countries, including India. In India there are two Systems of Green Building Certification

I. CII- LEED INDIA (Indian green Building Council).

II. GRIHA system developed by The Energy and Resource Institute (TERI).

Study of control the pollution by Road side purifiers by water storage and through raw material concept

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Abstract:-Now days we used the motor vehicle to travel one place to another place which is necessary to all for to make the journey smooth and comfortable and we used daily consumption lots of fuel which cause of main reason of pollution so can use the construct of purifier(**Hepa filter and Electrostatic Precipitators made of borosilicate glass fibers or plastic or fiber**) with air filter on road side which sucked the whole gases and dust particle through fan mounted on the top of filter where the some specific raw material converts the gases and dust particle collect into bottom of the tank mounted bottom of filter which direct connect to main pipe of fan mounted on top, water tank dissolved all dust particle into water and another water purifier bond to water tank purifies remain water here can use waste water reuse by filtration process for harvesting and drinking purpose.

Keywords:-HEPA filter, electrostatic precipitators, settling water tank, Activated corbon

INTRODUCTION:-Air purifiers evolved in response to people's reaction to allergens like pollen, animal ,dander ,dust ,and mold spores .Reactions like sneezing, runny nose and more severe consequences such as asthma attacks are the result of antigens found in the home. These antigens are major triggers of asthma, and there are more than 18 million asthmatics in the united states alone. Air purifiers remove a portion of these particles, thus reducing allergic type responses.

Due to their extremely small size, allergens are able to pass through a standard vacuum cleaner bag and redistribute into the air where they stay for days. Even a single microgram of cat allergens is enough to invoke an allergic response in most of the six to 10 million Americans who are allergic to cats. Other airborne particles such as bacteria and viruses can cause illness and some of which are fatal. There are many reasons allergies, asthma, fatal. There are many reasons allergies, asthma, fatal, illnesses that millions of air purifiers are sold in the united states every year.

There are two types of air purifiers that can remove some or all of the disease and allergy causing particles in the air and the most effective are classified as high efficiency particulate air filter HEPA filter and electrostatic precipitators.

Raw material:-

HEPA filters are made out of very fine glass threads with a diameter of less than 1 micron (micron is 0.00004 in 0.001mm). By comparison , a human hair has a diameter of about 75 microns (0.003 in 0.07mm).The fine glass threads are tangled together and compressed to form a filter mat. Because the individual threads are so microscopic, most of the mat consist of air. The openings in the mat are very small, generally less than 0.5 micron (0.00002 in,0.0005mm).HEPA filter will collect particles down to 0.3 microns(0.00001in,0.0003mm)in diameter.

Electrostatic precipitator rely on electrostatic forces to remove particles from the air . They work by creating a cloud of free electron through which dust particles forced to pass. Electrostatic precipitators can collect particles down to a diameter of 0.01 microns (0.00001mm). A water tank planted bottom surface of the earth

SUSTAINABLE APPROACH TO SOLID WASTE

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ABSTRACT

Sustainable development is not a product but it is a process, one of the most obvious impacts of rapidly increasing urbanization and economic development can be witnessed in the form of heaps of solid waste. Solid-waste management has become an important issue in the Asia-Pacific region, and it needs to be resolved through an integrated community, private sector and policy based approach. An attempt has been made to establish that how these three factors –Sustainable development, Solid Waste management and Environment plays a significant role in the construction of agro- based nation and also look at the relationship how solid waste dumped in open space or landfill site can contribute to the generation of landfill gas and contribute to climate as well as environment conservation in developing countries.
This study endeavors to understand the role of solid waste for the development of individual, society and nation. It focuses on producing lasting impacts on the management of solid waste in developing countries.

Keywords: Solid waste Management, Environmental Conservation, Sustainable development, Landfill.

1. INTRODUCTION

Solid waste management is an important facet of sustainable development for any nation and prioritizing solid waste management is greatly supported by global initiatives. Solid waste generation is a continually growing problem at global, regional and local levels. Improper disposal of solid wastes pollutes all the vital components of the living environment (i.e., air, land and water) at local and global levels. Urban society rejects and generates solid material regularly due to rapid increase in production and consumption. The problem is more acute in developing nations than in developed nations, as their economic growth as well as urbanization is more rapid. This necessitates management of solid waste at generation, storage, collection, transfer and transport, processing, and disposal stages in an environmentally sound manner in accordance with the best principles of public health, economics, engineering, conservation, aesthetics and environmental considerations. Thus, solid waste management includes all administrative, financial, legal, planning, and engineering functions (Ramachandra, 2006; Ramachandra and Varghese, 2003).

According to a United Nations Development Programme survey of 151 mayors of cities from around the world, the second most serious problem that city dwellers face (after unemployment) is insufficient solid waste disposal (UNDP 1997). Typically one- to two-thirds of the solid waste that is generated is.not collected. The uncollected waste is dumped indiscriminately in the streets and in drains, contributing to flooding, breeding of insect and rodent vectors, and spreading of diseases. Even waste that is collected is often disposed of in uncontrolled dumpsites or burned, polluting water resources and the air. Studies have shown that a high percentage of workers who handle refuse and of individuals who live near or on disposal sites are infected with gastrointestinal parasites, worms, and related organisms. Solid Waste Management (SWM) includes all activities that seek to minimize health, environmental, and aesthetic impacts of solid waste.

Given the current developments, the generation of solid waste in India in the year 2047 has been projected to exceed 260 million tons-a number more than five times the present levels. While the quantity of solid waste generated by society is increasing, the composition of solid waste is becoming more and more diversified. Thirty years ago, the composition of solid waste generated by the Indian farmer was characterised by one-fifth non-biodegradable waste and four-fifths biodegradable waste. At present, this ratio is about to reverse; today, a mere 40 percent is biodegradable while 60 percent is non-biodegradable. At the same time, many households do not

Thermal Analysis of Submarine Power Cable Considering Natural Convection

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Abstract: Conventional Energy production techniques consume fossil fuels and thus contributes to anthropogenic climate change. Migration from conventional and centralized energy production centers to green energy have generated the demand to look for alternate sources i.e. tidal and wind and location (ocean) for energy production. Ocean energy with vast potential and varying methods of generation has emerged as an alternate to fulfil the energy demand. However, transportation of this generated energy and distribution of energy across the marine environment require a new incite to the existing methods of calculation for sea floor temperature rise due to buried power cables. These methods neglect the effect of natural convection which is a significant factor for high permeable North and Baltic Sea surface composition. These seafloor are largely composed of Gravel and coarse sand. This study encompasses two scenarios of heating of ocean floor 1) Energy production (Wind Power Station) 2) energy transmission across the seas connecting neighboring landmasses. The simulation results show that neglecting natural convection underestimate the seafloor temperature rise which could be disastrous to the flora and fauna in cable vicinity and can cause permanent change to the sea bed.

Keywords: Submarine power cable, Natural convection, FEM, Heat transfer, Power transmission.

1. Introduction

The first submarine cable to carry electricity was laid across the Isar river in Bavaria, Germany during 1811. The importance and development in technology and design of submarine power cables in terms of capacity and length has increased since then and in the past two decades, with advent of offshore renewable energy such as wind, marine and tidal installation, a network of cables are laid near and far from the shore line. The generated energy from these decentralized power production centers, which are far from industrial/consumption centers has generated the demand to reassess the power transmission systems. Submarine power cables are used to transmit the power across or from a water body. The installation and maintained of this system is cheap and a huge requirement is at horizon due to increasing demand of green energy. However, the generated energy is causing minimum environmental damage but the transportation of this energy emitting heat into the surrounding seabed can cause serious damage to the flora and fauna.[1 2]

Submarine power cables are of two type based on the current (i) High Voltage Alternating Current (HVAC) and (ii) High Voltage Direct Current (HVDC). AC cables are either 3 phase bundled in core or three separate cable, while HVDC may be monopolar (bundled together) or bipolar (separately lay).

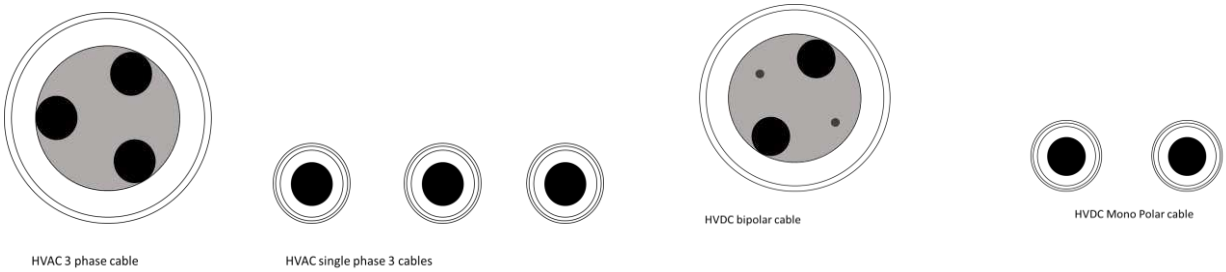

Figure 1: Showing two different kind of submarine power cable system and arrangement.

Literature Review of Various Nature-Inspired Optimization Algorithms Used for Digital Watermarking

Preeti Garg and R. Rama Kishore

Abstract Today, a tremendous amount of data is transferred online, so there is a need to secure this data. Digital watermarking is a process of embedding some presumed content image or data in any cover data so that the quality of the content should not degrade and it should not be visible to human eyes. This paper describes various characteristics required by any watermarking algorithm and explains some of the optimization algorithms. DWT, DCT and SVD alone are not sufficient for achieving the required robustness, imperceptibility and security of the digital content; some of the optimization algorithms are required to achieve these, so this paper reviews various nature-inspired optimization algorithms used for optimizing the process of digital watermarking and shows a comparative study of these techniques in tabular form.

Keywords Digital watermarking · Optimization · Genetic algorithm · Firefly algorithm · Particle swarm optimization · SVD · Artificial bee colony algorithm

1 Introduction

Today's world is a digital world because every information or data is available in digital form on the Internet. This availability of data on Internet allows users to share and access all the data and information in digital form which infringes the law of copyright ownership of particular data. As everything is available in digital form, one can use other's data easily and can modify it which gives birth to the digital watermarking. One of the applications of digital watermarking is to provide copyright

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Chapter 12
Data Mining—A Tool for Handling Huge Voluminous Data

Seema Maitrey and Yogesh Kumar Gupta

1 Introduction

Tremendous and exceedingly huge data is being accumulated recently almost in every field and growing continuously. The precious information is concealed in large databases. It is becoming very difficult and inefficient for researchers to analyze and retrieve knowledge from such huge tomb of data. Data is voluminous, so human intervention is not required, thus results in a rapid and economical way of exploring and analyzing data. Algorithms of data mining are comprised of techniques which existed few years back, i.e., at least 10 years [1]. Now, they are refined with matured, reliable and user-friendly tools in such a manner that they have consistently outperformed the previous methods. Data mining produced information and knowledge that got used in several areas, such as education, health care, finance, science, market analysis, intelligence agencies, internal revenue service, sports, Web education, credit scoring, engineering design and many more [2]. The significant use of data mining in these special areas affects our life in one way or other. It is improved due to the rise in information technology [3]. These fields are making the use of databases technology, parallel computing, distributed computing.

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Chapter 8

Improvement and Reduction of Clustering Overhead in Mobile Ad Hoc Network With Optimum Stable Bunching Algorithm

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ABSTRACT

In MANET, every hub isfitfor sending message (information) progressively without prerequisite of any fixed framework. Portable hubs oftentimes move in/out from the system powerfully, making arrange topology unsteady in portable specially appointed system (MANET). Therefore, it turns into an incredibly moving errand to keep up stable system. In this chapter, the authors have proposed an upgraded stable bunching calculation that will give greater soundness to the system by limiting the group head changes furthermore, diminishing grouping overhead. In proposed optimum stable bunching calculation (OSBC), another hub is presented which goes about as a reinforcement hub in the bunch. Such reinforcement hub goes about as group head, when real bunch head moves out (or passed on) from the bunch. Last mentioned, the group head reelect another reinforcement hub. This training keeps

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PERFORMANCE COMPARISON OF VARIOUS FILTERS ON DESPECKLING OF MEDICAL ULTRASOUND IMAGING

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ABSTRACT

Ultrasound Imaging plays vital role in diagnoses a disease. US image suffers from speckle noise. Despeckling is an important task for accurate diagnosis. In this paper experiment has been performed to measure the effectiveness of various filters available for despeckling. Results are compared qualitatively and quantitatively the Peak Signal to Noise Ratio and SSIM parameters are used to quantify the results. On basis of these parameters the performance of various filters are shown.

Keywords: *Median Filter, Mean Filter, PSNR, SSIM, Speckle Noise.*

I. INTRODUCTION

Medical imaging is very much useful to investigate the human body to diagnose diseases. Currently in medical imaging technologies, ultrasound imaging is widely used modality, practically safe to human body, non surgical, portable, and lesser cost. US images are accessed by processing the echo signals reverted by body tissues, obtain distinct acoustic impedances. Due to this it can also show the movement of body's internal organ movement as well as the blood flowing through the blood vessels. These features enable ultrasound imaging the most adaptable diagnostic tool around the world in almost all hospitals.

Ultrasound imaging has been considered the finest technique for organ and soft tissue imaging from the last many years. Unfortunately ultrasound imaging gives low quality images that leads it difficult to interpret as they strongly depends on the operator's skill. This constraint is due to presence of speckle noise [1].

Due to US imaging principle it suffers from strong speckle noise. Speckle is image variance or a granular noise, exists inherently and degrades the quality of the medical ultrasound images. Speckle noise is mainly due to the interference of the returning wave at the transducer aperture. Speckle noise consequences from these patterns of constructive and destructive interference shows as bright and dark dots in the image. Speckle noise blurs the image details and decrease the contrast of ultrasound image, thus diminish the trustworthiness of the image that leads to the wrong diagnosis of the diseases. As a result, speckle noise reduction is the foremost requirement, whenever ultrasound imaging is used for tissue characterization.

Our objective is to improve the quality of the images by reducing the effect of speckle noise from the US imaging. For this many algorithm are evolved that are describe in next section. There are several parameters that are

An Enhanced Cellular Automata Based Filter for Despeckling of Ultrasound Images

Ankur Bhardwaj ; Sanmukh Kaur ; Anand Prakash Shukla ; Manoj Kumar Shukla All Authors

Abstract:
Speckle noise is a multiplicative noise which degrades the quality of ultrasound images and videos which causes the difficulties in evaluation and diagnoses of diseases by experts. Despeckle filtering is the emerging area of research necessary for US imaging. Cellular automaton is a novel and innovative technology which can be applied in image processing applications. The cellular automation techniques resolve a particular problem by considering it in terms of specific patterns. In this paper a new algorithm on cellular automata based approach for despeckling filter has been proposed. Experiment has been performed to compare the effectiveness of proposed filter. The proposed filter is compared with the existing filters both quantitatively on the basis of PSNR and SSIM it is found better. Future enhancement on the proposed filter is also discussed.

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I. Introduction

Ultrasound imaging is non-invasive technique widely used to diagnose any disease. It generates the real time images of different organs of human being like liver, kidney heart, uterus, stomach and many more. Despite of its cost effective and usefulness it is badly effective by speckle noise, quantum noise and environmental noise. The prior one not only reduces the quality o

ained in diagnosis of disease. It is upto the expert with their skills to identify the outcome of the US imaging. Speckle noise is a multiplicative noise and is present everywhere in the image.

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HealthStack–A Decentralized Medical Record Storage Application

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Conference paper
First Online: 31 July 2020

Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1166)

Abstract

The aim of this study is to design and develop a blockchain-based web app called Health Stack to maintain accurate and complete medical records of patients, to help doctors to fetch previous medical history of the patients, to assist user to find out the disease he or she is suffering from and much more. For medical services, secure data storage is one of major concern for people. This problem can be resolved by developing an app using a 'blockchain technology' having the features of decentralization and verifiability. Development of this app doesn't involve any kind

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Analysis of Two Phase Query Optimization Algorithm for Generating Optimal Query Plan using Randomized Algorithm

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Abstract: The environment in which large numbers of distributed sites are connected with each other, without sharing their physical memory is called distributed database system. The database systems that execute on each distributed sites are independent of each other. Replication and fragmentation are the two important techniques used in the development of distributed database. The replicas of the data are stored in different distributed sites for promoting the availability of data at all the distributed sites. Thus with the help of replication each distributed site can request for the replica of the data and can store the entire copy of the same. The concept of fragmentation is commonly used for flooding the data to various distributed sites. In this paper an attempts have been made to compare the results of Iterative Improvement (II), Simulated Annealing (SA) and 2 Phase Optimization (2PO) algorithms. The 2PO algorithm is also known as hybrid approach since it is a combination of II and SA. It is called 2 PO because it executes in two phase, in the first phase the II algorithm is applied, then in the second phase the SA algorithm is applied. The results of the experiments obtained after implementing II, SA and 2PO algorithms are compared. Based on the experimental result obtained it is oblivious that 2PO performs better than II and SA.

Key-words: Distributed database; Two Phase Optimization; Query Optimization.

1. Introduction

Replication and fragmentation plays a vital role in the establishment of distributed sites. Replication, replicates the data at distributed sites where as fragmentations on the other hand divide the relation into different fragments i.e. horizontal, vertical and mixed fragmentation [11]. The entire relation is divided into several small fragments and thus these small fragments are stored at various distributed sites for availability of data. Each site may access same data from the distributed locations. Therefore fragmentation is a better technique for storing the data at different distributed site as it takes lesser amount of memory space and time too [13]. Also in fragmentation, only the required data is stored as compared to replication.
Randomized algorithms generates best optimal query plan [6]. It is called 2PO since it uses II in the first phase and applies the SA in the second phase. The fundamental concept of the randomized algorithm is that it first selects some random plan and then it compares the cost of randomly selected plan with the neighbor plan [13].The process of selecting random plan continues till it obtains a plan with lower cost as compared to the final randomly selected plan[2]. Since the randomized algorithm adopts the advantage of both the II and SA algorithm thus it produces the optimal query plan with the lowest cost [16].
The generation of optimal query plan depends on the two factors, i.e. the search strategies and the number of distributed site participating [1]. There are various search

Exploration of Deep Learning Techniques in Big Data Analytics

Publisher: IEEE

Cite This

PDF

Poonam Rana ; Vineet Sharma ; Pradeep Kumar Gupta All Authors

Abstract:
Due to the advancements in modern technologies, big data plays a significant role in every field. Now to extract information and meaningful data from the various sources of data is a tedious task. In this paper we present various techniques of deep learning used in Big data processing and present various applications of Deep Learning in Big Data Analytics. Data comes from various sources like facebook, youtube videos,twitter data, LinkedIn, Millions of devices connected over the Internet,(IOT).

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I. Introduction

As we know that in today's World data is increasing day by day. Data comes from various sources such as twitter, face[illegible] actions, IOT(millions of devices connected over the internet).

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Key Attributes for a Quality Mobile Application

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Abstract— **The innovative advancement of cell phones, the significance of the Internet in the present society and the blasting market of the mobile devices have upset the mobile software programming altogether known as the product quality of portable intuitive gadgets. The mobile software programming gets increasingly competent and complex, which enables designers to apply entrenched quality strategies and models, from the work area of software programming advancement to mobile software programming. But still, mobile software programming moreover still has its portable explicit qualities, comparing models and techniques that must be balanced for its use in the larger domain. In the following research, some of the key attributes that must be incorporated and taken care for developing a portable quality mobile applications are identified. The key attributes determined by investigating before developed quality models which allows enhancing knowledge that can be drifted in the near future.**

Keywords— Mobile Application, Software Quality, Software Quality Models

I. INTRODUCTION

In such a booming industry of software programming, similar to the market of mobile devices today, software quality is a major issue nowadays [1] [2]. New stages and levels for the applications are pushed into the market to advertise, which lead time to showcase systems not once in a while, but the software programming quality is missed out in many cases. But still, particularly for today when the equipment segments of distinctive cell phones get increasingly assorted, programming turns into the particular product for end-clients and designers. To oversee portable explicit of software programming quality necessities, firstly the developed standard quality models get explored. After exploring the previously used models, it has been noticed that such a nonexclusive and widespread quality model covers much more than just software programming in the portable zone where it takes a parcel of time to separate the parts that fit the necessities of creating portable applications and levels of quality for them [3].

In the present research work, the aim is to identify the key attributes so that, a quality model can be proposed for portable mobile applications. The model must incorporate the essential factors for developing a mobile application. The model may be utilized for the progression of several applications that has the advantage, even in its essential rendition, which as of now centres around some of the major characteristics of quality. It has been noticed that if the process of designing these applications focus on the key attributes of the mobile applications, then the end product will be a quality product. The process of development is important for any kind of product [6].

Since the focal thought depends on setting up a software programming quality model for mobile applications which is going to be similar to the model suggested by Bohem, McCall and ISO 9126, it isn't limited to the given quality possession, but can be adjusted for the exceptional needs of explicit programming ventures and other applications [4] [5]. The present research work is organized as: Section II defines an overview of the related work. The identified key attributes for quality mobile applications are explored in Section III and the conclusion at the end in Section IV, and at last references.

II. RELATED WORK

Since various software programming quality models already exist and have substantiated themselves for numerous years. Two of the most adaptable models across the board models include model propounded by the Jim McCall et al. in 1976-1977 and B. W. Boehm et al. in 1978 [14] [15] [17]. Both of these quality models characterize fundamental client prerequisites, quality elements and qualities without constraining or centring themselves to a particular software programming boundary. Another model propounded by the International Organization for Standardization ISO 9126 in 1993, which was a model depends on the quality models suggested by McCall and Boehm. It distinguishes outer and inside quality attributes of programmable software products.

Other realized models were FURPS in 1987, ISO/IEC 9126 model in 1991, Dromey's model in 1995, ISO/IEC 25010 in 2011, and Bansiya's QMOOD model in 2002 [16] [25] [26]. All these, in general, are to the point, which means these are inconceivable to spread the unique needs of explicit software programming frameworks, as for mobile applications. Every one of them is pretty much appropriate for software programming mobile applications, yet none takes the particular conditions under record that becomes an integral factor with such intelligent inserted gadgets.

Various authors have also presented different types of frameworks for the assessment of the quality of the mobile applications. Franke and Weise propounded a framework for assuring the quality of the mobile applications. The framework was developed based on the previous quality models presented for assessment of the quality [27]. The model gets validated on the case study using statistical methods. In 2012, Wang et al. propounded another model for testing android mobile

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Redundant Iaas Cloud Selection With Consideration Of Multi Criteria Decision Analysis

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Abstract

Due to the rapid growth of dependency over Mobile cloud system, the demand of high computational system increases rapidly. Cloud computing gives the flexibility to users to use high computation system at nominal cost and scalability in dynamic and on demand fashion. The term offloading has attracted the researcher to obtain the highly capable cloud system with certain limitations such as minimum processing and communication time, make span, minimum operational cost. Offloading of data and application have definite positive keynotes such as it can extend the battery life of IOT devices also it is suitable for critical events (events those require minimum response time). In today, numerous cloud services providers are offering customized services, they are dedicated to fulfill the demands of user with negotiable service level agreement. But due to the inherent uncertainty involved in human judgment and lack of learning capacity, a dynamic cloud selection and decision model is required to evaluate the user preferences. That can recommend an optimal and redundant cloud system from the available pool of cloud service providers. Resolving of uncertainties and ambiguity in human's decision are solved through fuzzy set theory. In this paper, an optimal and redundant cloud selection model has been presented on the basis of multi criteria decision analysis under consideration. Weighted Sum Model, Fuzzy Analytic Hierarchy Process and Fuzzy Revised Analytic Hierarchy Process are evaluated on 10 different criterions. Overall the outranking result for the considered datasets is similar, while the computation power of AHP method is ideally superior with comparison to revised AHP method.

Keywords: Cloud service selection; Application Offloading; MCDM; WSM; AHP; RAHP

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IAIHC-025

Reinforcement Learning Instructions and Algorithm: A Survey and Classification

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Abstract

Reinforcement Learning (RL) is the toughest approach to artificial intelligence (AI), it is an area of machine learning, concerned with robotics and the mapping of software with the environment. In this study paper we attempt to do a quick survey of different RL algorithms, to give outlook on how the pathway moves in the research scenery RL. We are also trying to classify and give an overview of the 3-D (dimensional) problem, and how each of these dimensions' travel in different directions progressing. We quickly review the basic classifications of some popular and old. methods in RL. This paper discusses the latest treads; and sum up the entire topography visible from an Ariel view. We offer our frame of reference on saying that reinforcement learning ends with a 3D problem and challenges it is in front of us. We aspire this article provides a summary is a great place for students, researchers and scholars.

Keywords: Game Theory; Artificial Intelligence; Machine Learning; Reinforcement Learning; Deep learning; Deep Reinforcement Learning

Research and Analysis of Technologies used in Big Data

Manish Bhardwaj[1], Anil Ahlawat[2]
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Abstract- **"Enormous Data" could be a term together with the employment of strategies to catch, process, break down and envision conceivably vast datasets during a wise time span not available to straightforward IT innovations. By augmentation, the stage, instruments and programming used for this reason for existing are by and enormous referred to as "Huge knowledge advancements". In this manuscript, we give the importance, attributes, models, advances, life cycle and diverse totally different components of Big data.**

Keyword: *Cloud Computing, Big Data, Distributing Computing, AEP.*

I. INTRODUCTION

We have entered an amount of massive information. Through higher investigation of the large volumes of data that are becoming to be accessible, there's the potential for creating faster propels in varied logical teaches and up the productivity and accomplishment of various endeavors (1).

Huge data is creating exceptional open doors for organizations to accomplish more, faster bits of information that may fortify basic leadership, improve the consumer experience, and quicken the pace of advancement. In any case, today, most immense data yields neither importance nor esteem (2). Organizations are thus swamped by the total and assortment of data falling into and thru their activities that they battle simply to store the information—considerably less examine, decipher, what's additional, gift it in necessary ways that.

The expression "enormous information" incorporates over organized and exchange based mostly data. It in addition incorporates recordings, RFID logs, person to person communication discussioners, sensing element systems, search records, natural conditions, restorative sweeps, "information exhaust" — the path of navigates the net delivered by internet surfers—and the sky is that the limit from there.

Huge data systems supplement business insight (BI) instruments to open associate degree incentive from business sector information. While BI typically performs organized examination and offers a back read replicate into business execution, huge data examination provides a progressive perspective, empowering associations to visualize and execute on possibilities of what's to return (3).

Huge data could be a relative term portrayal a circumstance wherever the volume, speed associate degreed assortment of data surpass an association's warehousing or register limit with regards to express and convenient basic leadership. Enormous data, similar nowadays with trade insight, trade investigation, and knowledge pulling out, has affected trade knowledge which revealing with selection facilitate to expectation and another one basic leadership.

Governments anticipate that huge facts ought to upgrade their capability to dole out their natives and deal with real general difficulties including the financial system, medicative services, work creation, normal fiascos, and psychological oppression (4). Organizations utilize immense data to hunt once edges, governments use it to advance the open nice.

Huge information presents ideas, strategies, innovations, IT structures and instruments accessible to the large volume expanding of varied in sequence in higher usage of resonance and opportune administration selections furthermore, consequently improve the imagination and aggressiveness of endeavors.

The utilization of big data may offer adequate advantage to a little to medium calculable organization to the degree that the business would submit assets to actualize immense data innovation in-house (5).

To benefit the maximum amount as doable from huge data, undertakings should advance their IT foundations for modify the large frequency of sound, highvelocity, high-assortment wellsprings of statistics and coordinate it with the previous venture statistics to be examined.
Multifaceted troubles are often understood rapidly utilizing immense data what's additional, refined examination in associate degree confiscated, in-memory and comparable condition.

The pattern on the way to illustration based mostly statistics speech act apparatuses is merit investigation by any production that tries to infer additional esteem from immense statistics (6).

This manuscript is sorted out as pursues. Section I pair of introduces the foundation subtleties. Second area shows the

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Pre-processing Highly Sparse and Frequently Evolving Standardized Electronic Health Records for Mining

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Abstract

EHRs aid in maintaining longitudinal (life-long) health records constituting a multitude of representations in order to make health related information accessible. However, storing EHRs data is non-trivial due to the issues of semantic interoperability, sparseness and frequent evolution. Standard based EHRs are recommended to attain semantic interoperability. However, standard based EHRs possess challenges (in terms of sparseness and frequent evolution) that need to be handled through a suitable data model. The traditional RDBMS is not well-suited for standardized EHRs (due to sparseness and frequent evolution). Thus, modifications to the existing relational model is required. One such widely adopted data model for EHRs is Entity Attribute Value (EAV) model. However, EAV representation is not compatible with mining tools available in the market. To style the representation of EAV as per the requirement (i.e., relational table) of mining tools, pivoting is required. The chapter explains the architecture to organize EAV for the purpose of preparing the dataset for use by existing mining tools.

Introduction

Electronic Health Records (EHRs) provide a digital support to the healthcare industry. A database of EHRs assembles health data of a patient from various departments of a healthcare organization including administration, pharmacy, clinical, radiology, laboratory and nursing. Contents within EHRs can be structured, semi-structured, unstructured, or a hybridization of these. For example, the contents of EHRs can be in the form of plain text, basic types (such as state variable and Boolean), time, date, date-time (including partial date/time), paragraphs, coded text, encapsulated data (such as parsable and multimedia content), measured quantities (providing units with values), uniform resource identifiers (URI) and container types (such as set and list) (Sachdeva S. & Bhalla S., 2012). EHRs aid in exchanging patients' health information electronically from one hospital to another. This electronic exchange of EHRs diminishes the burden of patients to carry reports printed on papers and other health related documents. However, exchange of EHRs needs to be semantic interoperable i.e. communicating parties must depict the same meaning of the exchanged EHRs data without any ambiguity.

Semantic Interoperability

To attain semantic interoperability, distinguished standard organizations, such as ISO (ISO 13606-1. 2008. Health informatics -- Electronic health record communication -- Part 1: Reference Model,.; ISO/DIS 13606-2 - Health informatics -- Electronic health record

Chapter

Research on IoT Governance, Security, and Privacy Issues of Internet of Things

By ***Manish Bhardwaj***

Book Privacy Vulnerabilities and Data Security Challenges in the IoT

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First Published	2020
Imprint	CRC Press
Pages	20
eBook ISBN	9780429322969

ABSTRACT

The Internet of Things (IoT) is one of the most important advancements of this century. In its varied uses, for example in infrastructure, security, design, and privacy, it can be expected to play an imperative role in shaping the destiny of the digital world. IoT devices are connected through sensors that influence the information and its security. During this investigation, we used 5 stratified arrangements of the Internet of Things to handle the safety and privacy issues with IoT-engaged organizations and applications. Moreover, we wish to draw your attention towards how the IoT is trying to revolutionize the globe. This chapter focuses on the various topics and issues related to the Internet of Things, like governance, security, and privacy. These are the main issues for IoT and its growth in today's technologically advancing environment.

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A Robust Copy Move Forgery Classification Using End to End Convolution Neural Network

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Abstract— **In this digital world it is not surprising to do manipulation with digital images. With advantage of such technologies it has become very easy to misguide the observer about the reality appearing in the images. The objective behind such manipulation for fun and entertainment is acceptable but when such things are applied on sensitive information such as evidences used in judiciary system, to prove certain claim, using such manipulated images on social media becomes dangerous. Although many types of forgeries that could be performed with images such as copying certain part of image then pasting it in same image somewhere else in document with such precision that it appears normal to observer called copy move forgery. Other forgeries include splicing of images, image morphing, retouching etc. Two different categories of approaches are being used till recently for this problem of copy-move forgery detection. These are block based and Keypoint based approach wherein block based is computationally intensive and suffers from many disadvantages and other is based interest points or high textured areas whose features vectors are formed for comparison to find the duplicated regions. In this paper, a deep neural network based approach has been proposed with promising results that can classify images based whether any copy move forgery has been there in the images. The proposed work aims to classify all the images having copy move forgery with presence of scaling, rotation, different compression level. A new CNN model has been researched for this problem to obtain the accuracy of around 93-95 percent for different datasets alone as well on the combination of two or more datasets.**

Keywords— *Forgery detection, Tempering, CMFD, Block-based, Keypoint based, Convolutional neural network.*

I. Introduction

In the era of computation technologies and digital world it is has become very easy to manipulate images. Even on the smart phones high level of editing can be done easily. Various techniques of digital image processing led to image manipulation in number of ways. All available approaches motivates for different tempering in images for illegal use such as evidence, blackmailing, misguiding the observer etc. Different types of forgeries are possible in images such as tempering with authentication of images such changing source, splicing of images where two or more images are combined to have different interpretation and meaning from the scene. Other kind of forgeries includes copy move forgery where one part of single image is copied then pasted into same image in different location to certain part of image or to have replication effect. If an image is taken as input usually we can apply two approaches as existing Literature named as block based approaches [1] and Keypoint based method. Furthermore in block based approach the whole image is devided in small chunks of image of fixed size and then certain feature vectors are extracted through transformation like DCT [1], DWT [1] etc. These feature vectors are then compared for similarity to detect the forging in image. Block based approaches are usually not flexible to image rotation or scaling. Other Approach is Keypoint based where main focus is given on high textured areas in image. Interest points are detected using certain algorithm like harries corner detector, SIFT [2] or SURF [3]. All different techniques have some advantages and disadvantages but none of them alone flexible enough for different challenges of forgery detection.

A. Types of Forgeries

Usually types of forgeries possible are splicing, copy move, morphing as show in figure-1.

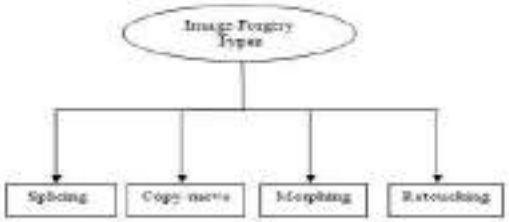

Fig 1. Classification of Image forgeries

1) Copy Move forgery: In Copy-move forgery detection as clear from example figure-2 that some part of the image is taken and pasted in other area of same image giving a different interpretation of image.

Original Image Forged Image

Fig 2. (a) Image of pigeon in original (b) Forged image after copying pigeon image in other part of image [4]

2) Splicing: In case of splicing two or more images [5] are used to have tempering effect. If spliced image is shown

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A Framework for Optimization of Software Test Cases Generation using Cuckoo Search Algorithm

Publisher: IEEE   Cite This   PDF

Sanjiv Sharma ; S. A. M. Rizvi ; Vineet Sharma   All Authors

Abstract:
Software testing is the most important phase of the software development lifecycle in the software industr
It is done to make sure that developed software is defect free; behavior of the software is same as expected and includes the generation of test data that satisfies some adequacy criteria like statement coverage, branch coverage, path coverage etc. This task is costly and time-consuming so there is an urg
for automation of this process. In recent years various meta-heuristic based nature-inspired algorithms a
applied in various fields of software engineering. This article proposes a framework for the generation of a
optimal set of test cases using a meta-heuristic based optimization algorithm called Cuckoo Search Algorithm as well as an overall algorithm for the same.

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Conference Location: Noida, India

I. INTRODUCTION

Software testing is the most important phase of the software development lifecycle in the software industry. It is the process through which we ensure software is reliable and trustworthy. Software testing consumes approximately 50 percent of the total efforts needed for development of software by a software development organization. These efforts include cost, time and manpower. In software testing, one generates test data/test cases, which further works as input to the concerned software, now behavior of the software on those inputs are examined to check whether it satisfies the requirement stipulated in the document called Software Requirement Specification (SRS) or not. Software testing can be done manual or automatic. Through automatic software testing, we can minimize manual labor and improve the overall testing efficiency by reducing the testing execution time as well as increasing the fault exposure and coverage ratio. Testing may be of two types, […] Structural testing is also known as white box testi[…] cases is based upon the internal structure of the program. Structural testing can be performed at the unit level, integration level or system level.

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A Survey on Multi-objective based clustering techniques for solving real l problems

Pooja Gupta ; Vineet Sharma All Authors

Abstract:
Clustering is a popular data mining technique which can be applied to a given data set to identify objects that belong to a single class, such that data objects in different clusters are distinct while exists for data objects belonging to the same cluster. Usually, clustering techniques are based on optimizing single objective function criteria, which may not be capable of performing well in many scenarios. Motivated by this many multi-objective based optimization techniques are discussed in paper. Multi-objective based optimization techniques are capable of optimizing several conflicting functions simultaneously. Under this context, evolutionary based approach and simulated anneali techniques are adopted in various MOO techniques and proven well in case of noise, non-spheri high dimensional feature space. The paper further discusses various validity measures to evaluat goodness of clustering techniques.

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I. Introduction

Machine learning has been emerged as the major area of research for dealing with many real life problems such as, medical diagnosis, collaborative filtering, and recommendation system, classifying the gene expression data, speech recognition, text mining and many more. The learning technique identifies and learns different models which can be used for various decision making p and supervised based machine learning techniques bjects. However, in several scenarios, semi-supervised learning technique is used due to the scarcity of labeled data. In real scenarios, training examples or external labeled data are often

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An Enhanced Cellular Automata Based Filter for Despeckling of Ultrasound Images

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Abstract:
Speckle noise is a multiplicative noise which degrades the quality of ultrasound images and videos which causes the difficulties in evaluation and diagnoses of diseases by experts. Despeckle filtering is the emerging area of research necessary for US imaging. Cellular automaton is a novel and innovative technology which can be applied in image processing applications. The cellular automation techniques resolve a particular problem by considering it in terms of specific patterns. In this paper a new algorithm on cellular automata based approach for despeckling filter has been proposed. Experiment has been performed to compare the effectiveness of proposed filter. The proposed filter is compared with the existing filters both quantitatively on the basis of PSNR and SSIM it is found better. Future enhancement on the proposed filter is also discussed.

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I. Introduction

Ultrasound imaging is non-invasive technique widely used to diagnose any disease. It generates the real time images of different organs of human being like liver, kidney heart, uterus, stomach and many more. Despite of its cost effective and usefulness it is badly effective by speckle noise, quantum noise and environmental noise. The prior one not only reduces the quality o

ained in diagnosis of disease. It is upto the expert with their skills to identify the outcome of the US imaging. Speckle noise is a multiplicative noise and is present everywhere in the image.

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Big Data and Cloud Computing: An Emerging Perspective and Future Trends

Publisher: IEEE

Cite This

PDF

Pramod Kumar Yadav ; Sanjiv Sharma ; Amar Singh All Authors

Abstract:
Big Data is a collection of large amount of data which is growing very rapidly with the popularity of social networking sites. The size of the Big data has been extended from terabytes to petabytes. Big data are characterized by four important attributes: volume, velocity, variety and veracity. The volume attributes describe the data at rest in the range from terabytes to Exabyte's, the velocity deals with data in motion, i.e streaming the data to respond within milliseconds rather than in seconds, the variety discuss the data in many different forms such as structured, unstructured, text and multimedia data, whereas the veracity deals with the data in doubt, i.e. uncertainty in data due to data inconsistency. These attributes of big data make it a challenge for organizations to have control over, and use such data. In today's era we are overloaded with the information, however we are lacking the insight. The 90% of the data in the world today has been created in the last two years by various social networking sites. As big data grows it challenges the capabilities of traditional data warehouses that collect and store large amounts of internal and external data. Data drawn from these repositories are used to improve decision making, increase organizational efficiencies, and improve organizational effectiveness. In this paper an attempt has been made to explore the real life application of Big Data , cloud database, Hadoop, Map Reduce and Cloud Computing, in various domains.

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I. Introduction

Due to the rapid growth in the modern technologies and popularity of social sites, there is a high growth in the amount of data generated every day. The big data plays a significant role in several applications. In today's era we are overloaded with information however we are lacking insight. Big data security and privacy is the one of important challenges where the researchers are focusing to get the optimal solution for it. Hadoop and Map Reduce are the important tools for handling big data. The concept of Cloud database also plays a key role in the development of handling large data. With the fast growing technology, the cloud database has emerged as one of the important aspects of handling large data. Even for storing large amount of data on cloud is very helpful as the

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2019 2nd International Conference on Issues and Challenges in Intelligent Computing Techniques (ICICT)

Comparative Study of Big Data Frameworks

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Abstract: **We are really living in ever growing volume of data production. The huge amount of data in terabyte and petabytes are generating in real word and it is a challenging task to access, storage, analysis of all structured, unstructured and semi structured heterogeneous and complex data, also traditional tools is not suitable towards distributed and real-time processing. We need an efficient framework for processing such heterogeneous data and transform it into optimized meaningful information. There are many frameworks for distributed computing has been developed to perform huge amount of data processing. Hadoop Map Reduce is the extensively used framework because of its scalability, security, latency and efficiency, and reliability. The intension of this paper is to relative study of common framework such as Hadoop, Spark, Flink, Samza and Storm.**

Keywords: ***Big Data, Map Reduce, HDFS, Hadoop, Spark ,YARN,, Scala, Samza HBase, HIVE, Flink, Storm, Oozie.***

I. Introduction

According to IBM Big Data Analytics 2019 about 294 billion emails sent every day, over 1 billion google search every day with 40 thousand search every second, trillion of sensors monitor, track and communicate with each other's, more than 30 petabytes of user generated data stored, accessed and analyzed, more than 230 million tweets each day with 7000+ tweets per second are generated. By 2020 at least third of all data will passes through cloud [1]. Before the year 2000 data was relatively smaller that the disk however data computation was complex, all the data computation depends on the processing power of the computer, later when data has grow the solution is large memory and fast processor. In order to store and process huge amount of data there are many frameworks available for data analytics. The fast evolution of big data technologies and the ready acceptance of the concept by public and private sectors left little time for the discourse to develop and mature in the academic domain [2]. The challenges of Big Data include capture, curation, storage, search, sharing, transfer, analysis and visualization [3]. Big Data Technology is very much adequate for the accurate analysis of our big data which yields strong conclusion and prediction. Big Data also categorized in two-part Operation Big Data and Analytical Big data. Using different Bigdata Framework we can analyze different Big Data issues/Problems.90% of data has got generated in last few years back.

II. Big Data Framework

2.1 Apache Hadoop

Hadoop is an Apache project founded in 2008 by Doug Cutting at Yahoo and Mike Cafarella at the University of Michigan [4]. Hadoop is a giant system that's provides two services (store and process) and consumes big Data. The data storage is responsibility of HDFS(Hadoop Distributed File System) and The Data Processing is responsibility of Map Reduce .Master in HDFS is called as Name Node and Slave is called as Data node similarly Master in Map Reduce is called Job Tracker and slave is called as task tracker. This particular setup with two services had a very serious limitation that we can write program only in MapReduce or any other framework that runs on Map Reduce we can't use Spark. Hadoop would allow to use the services with condition to write program in Map reduce only such Hadoop called as Hadoop 1.x, To do something better without such Conditional limitation YARN(Yet Another Resource Negotiator) comes into the picture in place of Map Reduce in Hadoop setup. YARN provides resources to anybody such as MapReduce, spark etc. without dependency of programming of Map reduce. In Hadoop 2.x Map reduce is one of the way to write program but in Hadoop 1.x , MapReduce is the only one way to write program.

2.1.1 Map Reduce

Map Reduce is one of the very important and major component of in Hadoop ecosystem use to solve problem for a big computational problem with large data set. In Map reduce huge data set is divided into small blocks and processing will be done in parallel. if you apply a particular algorithm parallel over the data for solving efficiently then Map Reduce solves in better form. The fundamental principle of Map Reduce is single instruction with multiple class of data problem can be effectively solve using Map Reduce using a very simple abstraction called Map and Reduce which works on divide and conquer approach. Some people has done hard work and proven that this simple abstraction is splitting a huge input file and doing some transformation, grouping the data and then aggregating this data, all these things can be done parallel. Generally, we treated data in form of list of record. The Map Reduce programming framework helps to iterate the list one by one and it will call a function called Map and as a programmer we need to write a logic to a map function to group the data together and for grouping we need a key which is associated with data.

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E-assessments and Feedback Mechanisms in Moocs

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Abstract- **Assessment can be defined as the interpretation of a student's work performed. It can be the guiding as well as decision making point for various stakeholders. It checks the learner on three pillars as to how student represent knowledge, how to develop competence and how to draw influence from the topic. Assessment is the best way to identify what the student wants as in support to increase his/her knowledge base. It encourages the desire in the learner to excel in various fields and progress further. Assessment is sometimes mistaken as evaluation but they are different in many perspective such as: Assessment is to evaluate the effectiveness of the teaching done, the process of appraising something, to check the level of performance whereas evaluation is judging the learner based on the standards, to determine to which degree the goals are satisfied. From the reference of all the assessment, we can propose m-assessment in which the practice tests and enhancement of the topic related questions can be uploaded and be assessed frequently and immediately.**

Keywords—e-assessment; interactivity; online higher education; feedback; skill enhancement

I. INTRODUCTION

The three pillars of student's education process is Teaching, Learning and assessment. Like teaching and learning, assessment is the core of learning background: how learners are assessed decides their understanding of the curriculum and checks their ability to progress in the particular area [1]. Assessment is not only for the marks as it is a formative term which enhances the overall personality of the learner whereas evaluation is a summative term ,only provides the marks and ranks without considering the feedback of the student [2].

Initially the education is based on the classroom pattern, where the importance of teacher was more and evaluation was done on face to face basis and eventually online resources were available. With the evolution of internet e-assessments are often denoted because the end-to-end electronic assessment method wherever Information and Communication Technology (ICT) is employed for the management of the educational assessment. From the perspective of various stakeholders such as learners, tutors, educational institutions, companies, regulators of administration and parents [3,5]. In other words, e-assessment involves the use of any web platform which is accessible by the internet and can be accessed at any place or time (conditions as per the instructors). The role of student and teacher in the learning process is significant where students' active participation and engagement with the resources is needed along with a continuous formative assessment, which is carried out during the learning process at short intervals such as after every unit or module with the help of the teacher only [9, 10] and not just at the end of the learning process, as is usual in traditional face-to-face examinations which only increases the anxiety of the student and sometimes student underperform due to the phobia [11]. The assessment is useful but its validity is questionable because the exams conducted at the end semester may not include the real time situations or recent activity. It is even less valid for the real world as we have the example of many universities who still have C and C++ in their curriculum and it is not even used in the companies' project now, in this case the e-learning can play an important role in this by giving knowledge base and improved learning. Students are made to learn them and are graded on that basis which is not the sole purpose of the formative assessment.

Assessment is categorized on various basis and it is further subdivided which is shown by table 1.

Table 1: Describing various types of assessment

S. No	Types	Sub-types	Work	Techniques
1.	Assessment for learning [4]	Formative (Criterion referenced)	Occurs regularly throughout the instruction process. Measures a student's performance against a specific goal.	Student observation Homework Reflection journals Sketchbooks Socratic discussions Student /teacher conference Peer reviews Portfolios Project Think/pair/share Critiques
2.	Assessment of learning [10]	Summative (Interim/Benchmark)	Predict the student's performance at the end of the year or semester.	Essays Tests Multiple choice questions Capstone projects Rubrics Performances Checklist
3.	Assessment as learning [12]	Diagnostic (Norm Referenced)	It compares the performance at the national norms or fixed values.	Pre and post tests elf assessment Discussion based report Entry/exit tikcets Interviews Observation polling

The combination of formative and summative assessment can utterly measure the abstract data, procedural and sensible skills needed in any subject. It may also cut back the teacher's work in checking the paper with the assistance

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Fuzzy Ant Colony Optimization Based Energy Efficient Routing For Mixed Wireless Sensor Network

Publisher: IEEE

Pravin Kumar ; Rajesh Dwivedi ; Varun Tyagi   All Authors

Abstract:
Wireless sensor networks contains small sensor node and processor which have several issues and challenges with regards to Limited Computational Capacity, Energy Efficiency, Path Planning Overhead and many more. Entire lifetime of network depends on efficient energy consumption in sensor network so it is a challenging task to design an Energy Efficient Routing Protocol for wireless sensor networks. Wireless sensor nodes dynamically self-organize themselves without utilizing preexisting infrastructure. Problem becomes more complex if some sensor node having mobility for some particular instance. In this paper we proposed an energy efficient routing protocol for WSN motivated by swarm intelligence of rummage behavior of ant and also covered mobility behavior of node. Furthermore we have combined the fuzzy logic with behavior of ant to take a better decision to find optimal path with less energy consumption. Our proposed algorithm utilize the principle of Fuzzy logic in addition of Ant Colony Optimization to develop energy efficient routing. The performance of our proposed work is evaluated on QualNet 7.4 Network Simulator. The simulation result shows that the proposed technique optimize the energy consumption, decrease RREQ packet and increase the lifetime of network as compare to existing routing protocol.

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I. Introduction

Wireless sensor network is one of the fastest growing technology in 21st century and become widely used technology in different fields. The infrastructure of wireless sensor node is composed by sensor nodes working independently with sensing, computing and enables the end user to measure and capture various act in different environment. In wireless sensor network the sensor nodes have small and compact in size, limited computational capacity with limited energy resources which is scattered over the area with vast diverse parameters like store and forward the data to Base station(BS) for further processing of sensed data. All sensor of WSN try to collect the data from the environment and send sensing data to base station. Sometimes it is possible that source and destination may not be in ... multi-hop distance which leads to more energy c... rgy consume can be find out by the energy consume by each nodes for sending or receiving data to or from other nodes in the network.

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Handling Structured Data Using Data Mining Clustering Techniques

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Abstract - **In the new era, every organization has the capability to store the extremely large amount of data. The continuous rise in the capturing of data is turning it into a huge tomb of data. Such huge data is becoming difficult to get analysed. This constantly growing large data set is making the challenge to the researchers in discovering knowledge from it. Valuable information is buried under the huge collection of data which can be extracted by making the use of Data Mining technique, as it possess the ability to dig out the embedded precious information from the large datasets. Various application areas required this technique, thus, resulted into an evolution of many data mining methods. Though several data mining methods got evolved not all of them were capable to deal with high voluminous data. Numerous computation and data- intensive scientific data analyses are established to compete with the ongoing time. As today's data has got converted to Big data, it now require large-scale data mining analyses to fulfil its scalability and performance requirements. To serve such data, several efficient parallel and concurrent algorithms got applied. The parallel algorithms used different parallelization techniques to manage the huge voluminous data and brought them into real action. Formerly, these techniques were : threads, MPI etc. which produce different performance and usability characteristics. The MPI model was efficient in computing rigorous problems but difficult to bring them into the practical use. Over coming years, Data mining is continuously spreading its root in business and in learning organizations. The new integrated clustering algorithm called CURE became more vigorous to outliers and recognizes those clusters that were having irregular shapes and are of variant size. CURE is formed with the combined features of random sampling and partitioning which assured that the quality of output clusters produced by it is much improved with respect to those clusters that are resulted from the prior algorithms. This paper put focus on CURE clustering technique which found suitable for working with large databases.**

Key Words – ***Data Mining, Clustering, Sampling, DBSCAN, BIRCH and CURE.***

I. Introduction

In the present situation, large amount of data is getting accumulated by the organizations and it is growing exponentially which tends to get examined inefficiently. It has become a challenge for researchers in data mining to discover knowledge from these continuously growing large data sets. Fundamentally, data mining processes data and identify patterns and trends hidden in that information which helps to make the decision [1][2]. Though the data mining principles have been existing for many years, it has become more popular and acceptable when the data collection resulted in a huge tomb of data or Big Data. This huge collection of data consists of a varied and extensive size that resulted in the sudden increase in the use of more widespread data mining techniques[3]. Due to the collection of the enormous set of data, the approval of simple and straightforward statistics is no longer adequate. Thus, this required more complex data mining techniques. The precious information which found embedded in a vast group of data is extracted by data mining[5]. It has become has become one of the remarkable areas of data mining to reveal such hidden information under voluminous datasets [2] [5]. There are several techniques found in data mining to deal with this huge data. They are clustering, classification, prediction, association, deviation and outlier analysis. Among these techniques, clustering is taken into consideration in this paper which would help in mining large databases [6]. i.e. to be used in data exploration. Clustering is the unsupervised categorization of patterns(data) into groups or clusters where each cluster forms higher intra-cluster similarity and higher inter-cluster dissimilarity. Number of clustering techniques is available based on different parameters like distance, density, hierarchy and partition. The researchers had addressed the problems in grouping the data items in many contexts and disciplines. Based on the understanding or utility, cluster analysis has long been used in a wide variety of fields: psychology and other social sciences, biology, statistics, pattern recognition, information retrieval, machine learning, and data mining. The scope of this paper is modest: to provide an introduction to clustering algorithm in the field of data mining, where we define data mining to be the discovery of useful, but non-obvious, information or patterns in large collections of data. Lot of clustering methods that have recently been developed are described here, with a goal of providing useful recommendation and references to fundamental concepts accessible to the broad community of clustering practitioners[7][8].

The paper is organized in following sections: Section 1 gives the introduction of paper, section 2 will discuss the overview of data mining, section 3 will focus on cluster analysis, section 4 gives glimpse of all clustering techniques and finally concludes to the best strategy to deal with large structured data.

Hiding Text In Color Image Using YCbCr Color Model: An Image Steganography approach

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Abstract— for the security related issues over internet two main techniques are used first is Cryptography and second is Steganography. Both are basically used for data security. Cryptography transforms the data from one form to another form while steganography hide data in an image such that its presence cannot be detected by human visual system. This paper present an approach for image steganography using YCbCr color model based on least significant bit. Proposed method transform the image from RGB to YCbCr color space then secret data is hidden inside YCbCr color space using least significant bit and transform it back to RGB color space after hiding the data. The said technique is evaluated by objective analysis. Different techniques of cryptography are compared using mean square error (M.S.E.) and peak signal to noise ratio (P.S.N.R.). It is observed that the proposed method have high P.S.N.R. and low M.S.E. which shows the proposed approach is very efficient to hide data in an image.

Keywords*— Image steganography. YCbCr color model, L.S.B., Objective analysis, M.S.E., P.S.N.R.** ***Introduction

I. INTRODCTION

Steganography is the process of hiding data into another data that cannot be detected easily through the human visual system.

Image Steganography is the part of Steganography in which images are used for hiding the secret data. The Word came

from Greek words "stegos" which means "cover" & "grafia" which means "writing" so "Covered Writing" is the meaning of Steganography. Steganography term is similar to Cryptography but there are some differences between them-

- Cryptography always concern about keeping the content message secret but Steganography is concern about keeping the existence of message secret.
- The terms which are important in Image Steganography are image quality after embedding the secret data and ability of the image to keep maximum confidential data as possible ease of use.

II Related work:

Different approaches were implemented previously for secure steganography.

a) Adaptive image steganography using pixel intensity differences:

Here the entire color image scans row by row and cover image is converted into binary format and stored in buffer then max intensity pixel is searched. Secret text is also converted into binary format. If there is intensity difference then two MSB's of secret text is replaced by LSB and LSB-1 bits of lower intensity pixel of cover image and contiguous high intensity pixel embeds data only at LSB bit. Further if there is intensity difference then we repeats this process until secret text not completely embedded.

Limitation: The algorithm is not too secure. We can implement more security by changing the encryption technique.

b) A novel image steganography approach for hiding text in color images using HSI color Model:

This method transform the image from RGB color space to HSI(Hue saturation intensity) color space and then embeds secret data inside the intensity plane(I plane) and transform it back to RGB color model after embedding.

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Improvement of Lifespan of Ad hoc Network with Congestion Control and Magnetic Resonance Concept

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Abstract

In versatile specially appointed systems, congestion happens with restricted assets. The standard TCP blockage control instructions cannot deal with the unique properties of a common remote channel. TCP blockage control works extremely well on the Internet. As it turned out, the incomprehensibly contrasting condition in a versatile specially appointed system is exceedingly hazardous for standard TCP. Many methodologies have been proposed to conquer these troubles. Versatile operator-based blockage control technique is proposed to maintain a strategic distance from blockage in specially appointed system. When portable operator goes into the system, the choice of it is that nodes which are less-stacked and for the same it refreshes the directing table as congestion status. With the help of above Power Efficient Congestion Control Algorithm (PECCA) save the power of the network and with another, wireless power transfer technique which recharge the portable nodes of the network so that lifespan of the network can't exhausted early. This manuscript shows the simulation result between AODV and proposed algorithm PECCA with different parameter metrics.

Keywords

MANET Ad hoc network TCP Congestion AODV

Prioritizing Factors Used in Designing of Test Cases: An ISM-MICMAC Based Analysis

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Abstract— **This research attempts to prioritize the factors that are important for the designing of test cases. There are many researches done on making testing complexities easier such as by applying various algorithms, approaches and processes to make testing automated. There are techniques that have been applied to prioritize the test cases so that testing time can be reduced. Therefore, in this research we have considered some factors by taking advice of experts and by the help of literature in this field that are taken care of for designing of test case. We have applied a new methodology that is ISM (Interpretive Structural Modelling) with MICMAC analysis technique. This theory has been applied in various field like management, science etc. but in the field of software engineering we have tried to implement it for the first time. By the help of this we have prioritized the factors. The rank has been associated with all the factors as per the partitioning theory applied in ISM. A diagraph has been formed and an ISM model is developed that clearly differentiate the factors on the basis of ranks. Then a MICMAC analysis is performed on the ISM model, in which factors are differentiated on the basis of their dependence power and driver power. A graphical representation of MICMAC is done. And the factors have been prioritized.**

Keywords— Factors of test case, ISM, MICMAC Analysis, Test case Prioritization, Diagraph.

I. Introduction

Testing a software is an important part of Software Development Lifecycle (SDLC). Testing is a technique where the computer program is processed under several conditions so that a quality product is delivered to the end users that contain the proper information as per requirement specifications. The inputs of test data have the high potential to detect the error at an early stage. While designing of the test suite the tester should keep in mind the valid and invalid data. One can test the data either manually or through automation to provide validation and verification of the program. During testing of software, requirements of system and components of system are exercised and manually evaluated or with the use of automation tools in order to find that the system is fulfilling specified need or not [1]. When software is tested it has to go through under various phases such as test planning, analysis, test case design, execution of test, bug logging, test closure. According to the requirement the tester defines which type of testing to be applied such as mutation, regression, load, black box, security, and white box testing and many more.

There are two central motivation behind testing: checking obtainment details and overseeing hazard (approval). In the first place, testing is tied in with checking that what was determined is what was conveyed: it confirms that the item (framework) meets the useful, execution, structure, and usage prerequisites distinguished in the obtainment details. Second, testing is tied in with overseeing hazard for the procuring organization and the framework's seller/designer/integrator to give the approval to the product. The testing project is utilized to distinguish when the work has been "finished" so the agreement can be closed, the seller paid, and the framework moved by the organization into the guarantee and support period of the undertaking [2].

The testing comprises of broadly two ways for testing of any software i.e. Manual Testing or Automated Testing. The testing of software that is done without any support of tools is defined as manual testing. The testing that needs the support of tools to get complete is defined as the automated testing. Testing can be done manually or through automation but to perform testing efficiently, test cases should be appropriately defined. That is, they should satisfy the requirement specifications. Therefore, to enhance the capability of testing, test case prioritization is the best approach. Ample number of researchers defined the concept of test case prioritization using different techniques but none of the researchers concentrate on the factors that are being actually cared when the testers developing or designing the test cases.

The research paper propounds a model that allows to prioritize the factors that help in designing of test cases so that the testers can focus on the determined critical factors for achieving good results with the motive of quality testing of the software product. The model proposed using an Interpretive Structural Modelling Technique (ISM) which helps in identifying the relationships among the critical factors and helps in enhancing the quality of the software product. Also, for analysis another approach named MICMAC analysis has been utilized so that the model can be verified and applied for prioritizing the factors in a right way.

II. Related Work

Number of different techniques already exist for prioritization of test cases. Various researchers have already been working on it from past many years. The test case prioritization can be classified in number of ways either depending upon the requirements of the customer, coverage based prioritization, time based prioritization, cost based prioritization, and prioritization based on historical information. Number of techniques have been proposed depending upon these classifications by various renowned researchers.

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Research on Modes and Defiance of Big Data and Cloud Computing

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Abstract—**Huge data is presently one among the foremost basic rising advances. vast information area unit used as an inspiration that alludes to the failure of customary data structures to proficiently upset the new informational indexes. The 4V's of huge statistics – volume, speed, assortment & truthfulness define the executives & investigation attempting for the standard information distribution centers. It's imperative to contemplate bigdata and examination along. The coordinative vast data with distributed computing advances, organizations and instruction foundations will have a superior course to what is to come back. In any case, there's an enormous concern with reference to protection and security problems once moving to the cloud that is that the elementary driver concerning why organizations and instructive foundations will not budge to the cloud. This manuscript presents attributes, patterns and difficulties of huge statistics. In this case, it researches the remuneration and it also provides the dangers that will ascend absent of the coordination among vast statistics and distributed computing.**

Keywords—map reduce; Iaas; Paas; SaaS; cloud computing

I. Introduction

Enormous information is associate degree info examination system authorised by another age of innovations and style that bolster high-speed info catch, reposition, and investigation. info sources stretch out past the customary company info to include email, telephone yield, sensor-produced info, and web-based social networking yield [1]. info square measure nevermore restricted to organized info records but incorporate unstructured info – info having no customary composition [2].

Huge information needs prodigious measures of additional area whereas the price of capability unbroken on declining, the assets expected to use vast info will even currently gift cash connected challenges for small to medium measured organizations. an everyday huge info reposition and examination framework are based on clustered prepare joined capability (NAS). clustered NAS framework needs setup of a couple of NAS "cases" with each an "case" contained a couple of reposition gizmos related to a NAS gadget. The arrangement of NAS gadgets square measure then unified to permit mammoth allocation and looking out of statistics[3].

Distributed computing is associate degree improbably effective worldview of administration placed registering, and has upset the way within which process framework is disconnected and used. 3 most thought cloud standards include: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and package as a Service (SaaS). the concept anyway will likewise be reached butt info as a Service or Storage as a Service. skillfulness, pay-examine, low forthright speculation, low time to plug, associate degreed move of dangers square measure some of the most important empowering highlights that create distributed computing an all inclusive worldview for conveyance novel applications which weren't financially potential in an exceedingly customary endeavor framework settings.

The paper is sorted out as pursues in area 2, Introduction about the topic is given. Area 3 demonstrates the general Overview of the Big data. Section 4 of this manuscript describes the overview of management of dynamic information in CLOUD. In segment five, we tend to gift the "Map Reduce" and "Hadoop" a free indoctrination composition underpins the handling of huge provision of statistics in an exceedingly distributed registering condition. The paper at long last finished up in space 6.

II. Related Work

Huge knowledge and Cloud process square measure an interesting patterns that square measure quickly was developing and new difficulties and arrangements square measure being distributed on a daily basis. In 2014, a production was created to characterize the most effective techniques to send large information examination details to the cloud[4]. Some arrangement of stepladder square measure characterized in half-dozen stages: the most stage, we tend to build up the commerce use crate by concentrating on however the profound trade esteems are going to be accomplished by shifting to the cloud & acknowledge the processing tools to accomplish. Following this is often adjusting the partner's stipulations to the crate therefore on accomplish their facilitate. At long last the case should be plausible by recognizing the key favorable circumstances that out weight totally different arrangements accessible: the following stage, is to induce to you application outstanding budget. Contingent upon the sensible necessities put and trade crate, the cloud administration have to be compelled to have to be compelled to the capability to assist the remaining task at hand with the capability to quickly enhance because the new outstanding tasks at hand return on the web[5]. The third organize, is to make up a specialised thanks to traumatize the massive info

Voltage Control by Optimized Participation of Reactive Power Compensation Using Fixed Capacitor and STATCOM

Nitin Kumar Saxena

Abstract FACTS devices play a significant role in providing voltage control through adequate reactive power compensation under the conditions of load and input changes. In isolated wind diesel based hybrid electrical system, choosing adequate participation of reactive power compensation device becomes more important because of the following aspects; (i) unlike to grid connected system, additional sources are required for supplying reactive power, (ii) normally self excited induction generators are used for power generation through wind and these generators require reactive power for building up the voltage, (iii) wind generators power output is much affected by changes in input wind speed and these changes require additional reactive power to control the voltage, (iv) similar to input change, load changes also require additional reactive power to maintain the voltage level, (v) compensating device should respond fast for nullifying the voltage deviation in minimum time, (vi) the procedure adopted for reactive power compensation should be economically acceptable even for the last end user in the society. Therefore, the reactive power compensating devices for voltage control in isolated hybrid electric system should be participated optimally by considering these technical and economical aspects simultaneously. In this chapter, MATLAB (programming along with simulink model) based approach is demonstrated for voltage control through optimized participation of reactive power compensation using fixed capacitor as static and STATCOM as dynamic compensator.

Keywords Static Compensator · Dynamic Compensator · Reactive power compensators · Compensation cost · Ancillary services

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Modelling for Composite Load Model Including Participation of Static and Dynamic Load

Nitin Kumar Saxena and Ashwani Kumar

Abstract It is well recognized that voltage problems in power system is much affected through the connected loads. Different types of load can be modeled on their characteristics basis for computation of power system problems effectively. For different power system studies especially in the area of power system optimization problems that includes voltage control with reactive power compensation, transfer function $\Delta Q/\Delta V$ of composite load is required. This chapter gives a detailed mathematical modelling to compute the reactive power response with small voltage perturbation for composite load. Composite load is defined as a combination of static and dynamic load model. To develop this composite load model, the exponential load is used as a static load model and induction motors are used as a dynamic load model in this chapter. To analyze the dynamics of induction motor load, fifth, third and first order model of induction motor are formulated and compared using differential equations solver in MATLAB coding. Since the decentralized areas have many small consumers which may consist large numbers of induction motors of small rating, it is not realistic to model either a single large rating unit or all small rating induction motors together that are placed in the system. In place of using single large rating induction motor a group of motors are being considered and then aggregate model of induction motor is developed using law of energy conservation and this aggregate model is used as a dynamic load model. Transfer function of composite load is derived in this chapter by successive derivation for exponential model of static load and for fifth and third order induction motor dynamic load model using state space model.

Keywords Static load · Dynamic load · Composite load · Aggregate load · *ZIP* load model · Exponential load model · Induction motor load

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Economic Benefits for Reactive Power Compensation as Ancillary Service through Multi Units Based Electrical System

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***Abstract*— In available studies of multi units based hybrid electrical system, technical and operational issues are well taken by several researchers to describe their benefits over single unit based hybrid electrical system. However, economic issues are almost not attempted in available literature for the same. To be precise, economic investigations about the payment towards hybrid compensation cost as one of the important ancillary service to control the terminal voltage are not focused yet and so, the same are being investigated in this work. For this work, reactive power and compensation cost are being evaluated using hybrid compensation of static and dynamic compensators in wind diesel based hybrid electrical system developed for multi units as well as single unit system. The main contributions of this paper are; (i) optimization of reactive power quantity through fixed capacitor and STATCOM in presence of composite load, (ii) compensation cost estimation for changes in load and input, and (iii) comparison of economic benefits for reactive power compensation as ancillary service through multi units and single units based system of same capacity.**

Keywords—Multi units electrical system, dynamic compensators, static compensators, composite load model, voltage control, compensation cost as ancillary service, STATCOM

I. INTRODUCTION

In India, 139445 MW peak demand and 135184 MW peak met was reported as on 31.01.2015 [1]. Development of suburbs because of high population density in inner-cities is the most rapidly increasing urban residential model in India and therefore demands more electricity from the power system. According to Central Electricity Authority (CEA) annual report published at the end of financial year 2018, installed generating capacity in India has reached up to 344002.39 MW [2]. These statistics represent the improving life style and prosperity in India. In contrast of this situation, there are still some such regions in India that cannot be electrified efficiently through central power grid due to their geological conditions. Almost 50% population living in rural areas of India which is more than 40 Crores (400 million) in numbers still had no reliable, continuous and secure access to electricity. Government is putting all possible efforts to provide electricity for such far located consumers. Also T&D Losses, exponential increase in rural consumers demand and congestion in distribution lines has already motivated to private investors for using renewable based decentralized power plants to enhance the electricity generation with the support of several central and state government policies [3].

To provide continuous and reliable power in such remote areas, renewable energy based generators along with conventional fuel based generators are used without grid connection. Such systems are called isolated hybrid electrical system (IHES). Researchers have presented models in which induction generator (IG) and synchronous generator (SG) are used for fetching power through wind and diesel respectively [4-9]. These IHES are designed by using single unit of SG and single unit of IG. Typically the most efficient diesel based SGs are allowed to run at their rated output. But, single unit generator may have to work for a wide range of system load demand during its operation. Evidently, a very rapid cycling, on and off, of such large diesels would not be efficient or sensible [10]. Though the continuous on-off operations cause serious issues in system but still it is preferable to avoid an inconvenient unloading of the diesel engine. So, the power generation using diesel system must be reduced during light-load periods or good wind conditions. This can be achieved by replacing a single unit power generation with multi units power generation. It is also reported that multi diesel systems allow a variety of possible operation and control strategies. Therefore, multi diesel systems of small rating can give satisfactorily result compare with single large rating unit.

It is also reported that multi wind systems can attenuate the effect of power fluctuations produced due to wind intermittent nature [11]. Need for short-term storage can also be eliminated in IHESs with power generation capacity is made up with multi wind and multi diesel machines [12]. Therefore, it can be concluded that configuration and components rating in wind diesel based IHESs may be decided depending upon the load type, pattern and resource available at site. Available papers explain the operational issues in installing the high rating wind and diesel systems. The operation of high rating systems are not benefitted due to several issues such as high maintenance, complex control strategies and low flexibility to change in generation with load change [13]. The use of multi generating units can provide scale benefits to improve operation performances.

The above explained discussions clearly depict the advantages of using multi units of wind and diesel system in electrical system on the basis of their operational and technical benefits. Still, there is a wide scope of analyzing the economic issues of multi units' electrical system as most of such hybrid electrical systems are commissioned for remote areas where consumers are not financially strong. Ref. [15] suggests that a logical pricing of an ancillary service can lead to market liquidity which in turn results in approaching the optimal condition. Voltage control has prime importance in the system along with other ancillary services like system control, regulation, load following, energy imbalance. In isolated hybrid electrical system, voltage can be supported and controlled by the compensators with the help of

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Performance Evaluation of a 4 kW Isolated Solar Powered Lab with IoT Energy Management System

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***Abstract*— A stand-alone solar powered system is an economic & effective alternative to provide electric power at places in remote and difficult terrains. These setups consist of an array of solar panels, dc-dc charge controllers, dc-ac inverters & an energy storing element. This work presents performance evaluation of an isolated photovoltaic (PV) power plant roof-top installation located at Electrical Department block, Krishna Institute of Engineering & Technology, Muradnagar, U.P., India. The aim of this work is to promote the utilization of mini isolated solar power plants to provide electricity to schools & households in rural locations & places with difficult terrains. The scope of this paper is to acquire data from the installed setup & evaluate performance of the system. In this work, we establish an economic energy logging system for data logging & monitoring. This energy management system uses a Wi-Fi module for Internet of Things (IoT), which provides easy access to the data anywhere around the world. After its successful installation, the performance of the stand-alone PV system is evaluated. The experimental data was recorded from 1st August to 30th October, 2018 through the IoT system. The assessed parameters of the PV installation include performance ratio, Capacity utilization factor, inverter efficiency and system losses.**

Keywords- Renewable Energy; Solar energy; Internet of Things; Performance Evaluation; EMS.

I. INTRODUCTION

Electrical power plays an important role in this modern civilization. In order to have proper and sustainable development of a nation, it depends on the availability of energy for industries and human civilization. Along these lines, it can be seen that energy is a fundamental component for the financial improvement of a nation. It is a significant part of our life and it is impossible to imagine our daily routines without electricity. "Yet, over 1 billion people in the world do not have access to electricity. Of this, over 95% live in developing countries and over 84% reside in rural areas" [1]. Meanwhile, the world has the problem of emptying reserves & sky-rocketing cost of fossil fuels. "Additionally, there is special focus on the major problem of Global Warming and pollution. These issues prompt us to reduce our dependence on fossil fuels as the primary source of energy" [1]. Hence, it is high time that the world focus on other sources of energy, and develop and promote renewable sources like solar, wind, geothermal, and others.

Amongst the current renewable energy options, solar power presents the highest potential. "The approximate emission power from the sun is 1.8 x 1011 MW" [1, 2]. Because the nation of India is situated in the sunny belt, it gets 300 days of sunlight. As per NIWE estimates, "India has a solar energy potential of 750 GW" [3]. Under normal conditions, India gets 4-7kWh solar radiation per m^2 [4]. Under the National Solar Mission, "India plans to build large grid connected solar power plants, with a cumulative installed capacity of 20,000 MW by 2020" [5].

Photovoltaic (PV) modules or panels are made from semiconductor materials which have the ability to directly convert sunlight into electricity. Such modules offer us a secure, reliable, low-maintenance and environmentally sustainable source of electricity for a very long time. In order to properly implement a solar PV powered system, prior data, knowledge & understanding of their operation and running performance under varying climatic condition is required [6].

In this work, performance analysis of a 4000W SPV system which was setup on the roof-top of Electrical Department block, Krishna Institute of Engineering & Technology, Muradnagar, U.P., India. on July, 2018 is presented. The setup supplies power to a laboratory in Electrical Department. "The performance of this Photovoltaics (PV) system is assessed on daily basis. Data logging & monitoring is done by Wi-Fi based IoT system that can be accessed from anywhere. In this paper, the development and performance of this PV system is presented for three months from August to October 2018" [1].

The aim of this work is to encourage the utilization of isolated SPV systems in in rural locations & places with difficult terrains. This project has a wide scope for the long-term benefits as well. Once a large data-set is logged, this information can be utilized by creating smart methods to analyze and predict

A Nature-Inspired Metaheuristic Swarm Based Optimization Technique BFOA Based Optimal Controller for Damping of SSR

Rajeev Kumar, Rajveer Singh and Haroon Ashfaq

Abstract In the proposed paper, an innovative method for damping of sub-synchronous resonance in a series capacitor compensated line has been investigated. A nature-inspired metaheuristic swarm based optimization technique BFOA is applied over the optimal control theory for damping and mitigation of sub-synchronous oscillations, with a FACT controller (SVS) connected at the midpoint of a series capacitor compensated network. The analysis has been carried out using IEEE first benchmark model and the entire test system has been simulated using MATLAB software, the simulation results include the eigenvalue analysis which explicitly shows that the application of BFOA on the optimal control theory, the problem of SSR is effectively minimized. Further the time domain analysis for the response curve of rotor angle (Mech-Delta 5) also shows the effectiveness of the proposed BFOA based optimal controller. All the time domain parameters viz., rise time, settling time, overshoot, and peak time is improved by the application of optimal controller which is further improved by the application of BFOA over optimal controller.

Keywords BFOA · Eigen value · Optimal control theory · Static var system · Sub-synchronous resonance · Torsional oscillations · Time domain analysis

1 Introduction

The use of series capacitors in transmission line definitely helps in the improvement of power transfer capability as well as transient and steady state stability limits of power systems and it is also economical compared to the addition of new lines. However, the Series compensated lines having capacitance C have a tendency to produce series resonance at frequencies below the fundamental power frequency. This is called sub-synchronous resonance [1–4]. SSR problem results due to the interaction

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Capacitance Requirement for Rated Current and Rated Voltage Operation of SEIG Using Whale Optimization Algorithm

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Abstract

In today's world non-conventional energy resources are being considered as powerful resources in the field of power generation. To optimize the resources required to generate the power is always be a challenging task. Many meta-heuristic algorithms have been applied for solving the complex optimization problems. Resource optimization is also a n-p hard problem. Whale optimization (WO) is newly developed meta-heuristic performed efficiently for solving complex engineering problems. In this paper WO is used as an optimization algorithm in order to optimize the value of excitation capacitance for rated voltage and rated current operation of self-excited induction generator. The simulation has been carried out on a 5.5 kw rating induction generator and the same has been used for the experimental validation. The results as obtained shows that WO outperformed as compared to other meta-heuristic

*Keywords:*Self-excited induction generator (SEIG), Whale optimization algorithm (WO), Genetic algorithm (GA), Wind energy, balanced operation.Introduction

1. Introduction:

In order to analyze the steady state performance of self-excited induction generators, per-phase equivalent circuit of self-excited induction generator has been adopted which is analyzed using the loop impedance method whereas another approach based on nodal admittance may also be used for the performance analysis of SEIG [1]. The roll

10.1016/j.procs.2020.03.315

Comparison among APSO, PSO & GA for Performance Investigation of SEIG with Balanced Loading

Publisher: IEEE

Yatender Chaturvedi ; Sumit Kumar ; Priti Bansal ; Sushil Yadav **All Authors**

Abstract: In current scenario wind energy is counted as important factor for power generation in order to minimize the gap between generation of power and load demand across the wo... **View more**

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Abstract:

In current scenario wind energy is counted as important factor for power generation in order to minimize the gap between generation of power and load demand across the world. Due to several features, Self-excited induction generators (SEIG) are being actively used for power generation through wind. This paper is targeted on the steady state operation SEIG under balanced operation feeding a resistive load. Three optimization techniques namely APSO, PSO and GA have been considered for the performance investigation of SEIG. The results obtained from APSO, PSO and GA are compared with experimental results on a 5.5 KW rating induction machine. Comparison among optimization techniques APSO, PSO & GA has been made which shows the

References

Citations

Keywords

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effectiveness of optimization techniques as presented for finding of known variables associated with the induction generator.

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Contents

In present scenario energy is the main requirement for the growth and progress of any society. The conventional energy sources like coal, gas etc. used for power generation are pollutant and hazardous which are destroying the nature and our society as well. Continuous reduction in the conventional energy sources used for power generation and its harmful effect on environment are encouraging the researchers to work in the direction of non-conventional energy like wind, solar, geothermal, tidal, biogas etc. Energy generation via renewable energy resources is growing continuously and among them share of energy generation through wind is dominating the others. Currently, wind energy is being used by around one hundred countries in the world on a commercial basis. Among them, the top five countries which are working with energy from wind are China, USA, Germany, India and Spain.

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SELF-EXCITED INDUCTION GENERATOR: AN INSIGHT

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Abstract- With the ever increasing demand of power for the sustaining of humans civilization and the threat of depletion of conventional energy sources, focus has been centered to the possibilities in renewable energy during the recent past to accomplish the energy requirement. The Self Excited Induction Generator has been identified as an ideal alternative to the well known synchronous generator for meeting the growing demand of electrical energy. As a matter of fact, various researches and experiments have been done to optimize the performance and characteristics of Self Excited Induction Generator. The objective of this paper is to get an insight of the literature of research on Self Excited Induction Generator in the last three decades.

Keywords- Self excited induction generator, Voltage built up, Steady state and transient analysis.

1. Introduction:

To maintain the balance between the supply and demand of electrical power for the much electrified modern world, renewable energy sources like wind energy, solar energy, bio gas etc. have been marked as promising alternatives to replenish the requirement of power [1-6]. The Self Excited Induction Generator, abbreviated as SEIG, being used for the conversion of wind energy into electrical energy, has become a popular alternative source of energy. This is because of some of the outstanding features exhibited by SEIG like its simplicity, robustness, ease of maintenance, lesser unit cost etc. The SEIG is actually an induction machine being operated in the generating mode. A three phase capacitor bank, when connected across the induction machine, provides the excitation, thereby inducing an emf in the winding of the machine. Accordingly, the SEIG, with a three phase capacitor bank as an auxiliary, is called a self excited SEIG. With the three phase capacitor bank being connected, the SEIG becomes the source of power supply in isolated mode. Like any other machine, there are various structural and operational characteristics of SEIG. With the advent of power electronic convertors, the SEIG has been embellished with the precise control over its operating characteristics. The SEIG has some outstanding advantages such as reduced maintenance cost, ruggedness, brushless construction in squirrel cage type, absence of external dc excitation etc.

International Conference on Renewable Power-2020

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This is to certify that Dr./Mr./Ms./Mrs. "Mohammad Shariz Ansari" of "KIET Group of Institutions, Delhi-NCR, Ghaziabad" has presented paper "Techno-Economic Analysis of Diesel/Wind/PV/Battery Hybrid Energy System for Androth Island" in "**International Conference on Renewable Power-2020**" jointly organised by the Electrical Engineering Department, BGSB University, Rajouri, J&K & Electrical Engineering Department, ZHCET, AMU, Aligarh during *July 13 & 14, 2020*.

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A Scientific Study on Effect of Polarization in Calculation of Rain Attenuation Using ITU-R Model

Authors: Arun Kumar, Natwar Singh Rathore, Alok Kumar Pandey

Publisher: Springer Singapore

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Abstract

This paper addresses the current need to work on higher frequency levels for radio wave communication because of need for higher speed requirement in communication system and also because the current frequency spectrum is congested. While establishing radio communication links of higher frequencies it is important to study various problems associated with them. Rain induced attenuation at higher frequency is a major problem. Therefore, a study has been done on rain attenuation and effect of polarization is calculated for six different regions of the world. The simulation results are tested on ITU-R model and various findings throughout the simulation work have been concluded.

Springer Link

Optimal Controller Design for Altitude Control of Modern Airship

Recent Advances in Mechanical Engineering pp 205-211 | Cite as

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Abstract

This paper describes modeling and full-state feedback controller design of airship for stabilization of altitude. The state feedback controller based on linear quadratic (LQ) optimization technique is realized, and performance is compared with pole-placement-based controller. The weighing and regulating matrices are designed and analyzed for the performance of designed controllers for the modern airship. The performance analysis is also presented in this chapter.

Keywords

Full-state feedback controller Linear quadratic regulator Airship

References

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Comparison of Haar and Daubechies wavelet based denoising for speed control of DC motor

Publisher: IEEE

Cite This PDF

Abhas Kanungo ; Monika Mittal ; Ullie Dewan All Authors

20 Full Text Views

Abstract:
This paper presents the comparison between Haar and Daubechies wavelet based denoising for the application of speed control of DC motor in the presence of noise. The multiresolution property of wavelet is utilized to compensate for the effect of noise in the system. In addition, the performance of associated controller is improved in the presence of uncertainty. It has been observed that similarity of the wavelet's wave shape to the signal being denoised has a direct bearing on its denoising performance. Simulation results are obtained with the help of MATLAB@2015a

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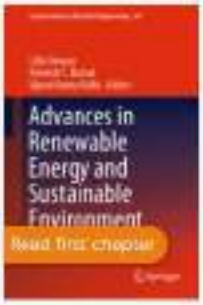
GA and PSO Based Optimization for Benchmark Thermal System Using Wavelet-Based MRPID Controller



Authors: Abhas Kanungo, Monika Mittal, Ullie Dewan

Publisher: Springer Singapore

Published in: Advances in Renewable Energy and Sustainable Environment

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Abstract

A high performance thermal control system that can handle temperature uncertainties is significant for various applications. The characteristics of such systems can be improved by tuning the control parameters of multi-resolution proportional, integral, and derivative (MRPID) controller, which is still a challenge. Therefore, this paper presents the two optimization techniques for optimizing the

Voltage Control by Optimized Participation of Reactive Power Compensation Using Fixed Capacitor and STATCOM

Nitin Kumar Saxena

Abstract FACTS devices play a significant role in providing voltage control through adequate reactive power compensation under the conditions of load and input changes. In isolated wind diesel based hybrid electrical system, choosing adequate participation of reactive power compensation device becomes more important because of the following aspects; (i) unlike to grid connected system, additional sources are required for supplying reactive power, (ii) normally self excited induction generators are used for power generation through wind and these generators require reactive power for building up the voltage, (iii) wind generators power output is much affected by changes in input wind speed and these changes require additional reactive power to control the voltage, (iv) similar to input change, load changes also require additional reactive power to maintain the voltage level, (v) compensating device should respond fast for nullifying the voltage deviation in minimum time, (vi) the procedure adopted for reactive power compensation should be economically acceptable even for the last end user in the society. Therefore, the reactive power compensating devices for voltage control in isolated hybrid electric system should be participated optimally by considering these technical and economical aspects simultaneously. In this chapter, MATLAB (programming along with simulink model) based approach is demonstrated for voltage control through optimized participation of reactive power compensation using fixed capacitor as static and STATCOM as dynamic compensator.

Keywords Static Compensator · Dynamic Compensator · Reactive power compensators · Compensation cost · Ancillary services

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Modelling for Composite Load Model Including Participation of Static and Dynamic Load

Nitin Kumar Saxena and Ashwani Kumar

Abstract It is well recognized that voltage problems in power system is much affected through the connected loads. Different types of load can be modeled on their characteristics basis for computation of power system problems effectively. For different power system studies especially in the area of power system optimization problems that includes voltage control with reactive power compensation, transfer function $\Delta Q/\Delta V$ of composite load is required. This chapter gives a detailed mathematical modelling to compute the reactive power response with small voltage perturbation for composite load. Composite load is defined as a combination of static and dynamic load model. To develop this composite load model, the exponential load is used as a static load model and induction motors are used as a dynamic load model in this chapter. To analyze the dynamics of induction motor load, fifth, third and first order model of induction motor are formulated and compared using differential equations solver in MATLAB coding. Since the decentralized areas have many small consumers which may consist large numbers of induction motors of small rating, it is not realistic to model either a single large rating unit or all small rating induction motors together that are placed in the system. In place of using single large rating induction motor a group of motors are being considered and then aggregate model of induction motor is developed using law of energy conservation and this aggregate model is used as a dynamic load model. Transfer function of composite load is derived in this chapter by successive derivation for exponential model of static load and for fifth and third order induction motor dynamic load model using state space model.

Keywords Static load · Dynamic load · Composite load · Aggregate load · *ZIP* load model · Exponential load model · Induction motor load

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Economic Benefits for Reactive Power Compensation as Ancillary Service through Multi Units Based Electrical System

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***Abstract*— In available studies of multi units based hybrid electrical system, technical and operational issues are well taken by several researchers to describe their benefits over single unit based hybrid electrical system. However, economic issues are almost not attempted in available literature for the same. To be precise, economic investigations about the payment towards hybrid compensation cost as one of the important ancillary service to control the terminal voltage are not focused yet and so, the same are being investigated in this work. For this work, reactive power and compensation cost are being evaluated using hybrid compensation of static and dynamic compensators in wind diesel based hybrid electrical system developed for multi units as well as single unit system. The main contributions of this paper are; (i) optimization of reactive power quantity through fixed capacitor and STATCOM in presence of composite load, (ii) compensation cost estimation for changes in load and input, and (iii) comparison of economic benefits for reactive power compensation as ancillary service through multi units and single units based system of same capacity.**

Keywords—Multi units electrical system, dynamic compensators, static compensators, composite load model, voltage control, compensation cost as ancillary service, STATCOM

I. INTRODUCTION

In India, 139445 MW peak demand and 135184 MW peak met was reported as on 31.01.2015 [1]. Development of suburbs because of high population density in inner-cities is the most rapidly increasing urban residential model in India and therefore demands more electricity from the power system. According to Central Electricity Authority (CEA) annual report published at the end of financial year 2018, installed generating capacity in India has reached up to 344002.39 MW [2]. These statistics represent the improving life style and prosperity in India. In contrast of this situation, there are still some such regions in India that cannot be electrified efficiently through central power grid due to their geological conditions. Almost 50% population living in rural areas of India which is more than 40 Crores (400 million) in numbers still had no reliable, continuous and secure access to electricity. Government is putting all possible efforts to provide electricity for such far located consumers. Also T&D Losses, exponential increase in rural consumers demand and congestion in distribution lines has already motivated to private investors for using renewable based decentralized power plants to enhance the electricity generation with the support of several central and state government policies [3].

To provide continuous and reliable power in such remote areas, renewable energy based generators along with conventional fuel based generators are used without grid connection. Such systems are called isolated hybrid electrical system (IHES). Researchers have presented models in which induction generator (IG) and synchronous generator (SG) are used for fetching power through wind and diesel respectively [4-9]. These IHES are designed by using single unit of SG and single unit of IG. Typically the most efficient diesel based SGs are allowed to run at their rated output. But, single unit generator may have to work for a wide range of system load demand during its operation. Evidently, a very rapid cycling, on and off, of such large diesels would not be efficient or sensible [10]. Though the continuous on-off operations cause serious issues in system but still it is preferable to avoid an inconvenient unloading of the diesel engine. So, the power generation using diesel system must be reduced during light-load periods or good wind conditions. This can be achieved by replacing a single unit power generation with multi units power generation. It is also reported that multi diesel systems allow a variety of possible operation and control strategies. Therefore, multi diesel systems of small rating can give satisfactorily result compare with single large rating unit.

It is also reported that multi wind systems can attenuate the effect of power fluctuations produced due to wind intermittent nature [11]. Need for short-term storage can also be eliminated in IHESs with power generation capacity is made up with multi wind and multi diesel machines [12]. Therefore, it can be concluded that configuration and components rating in wind diesel based IHESs may be decided depending upon the load type, pattern and resource available at site. Available papers explain the operational issues in installing the high rating wind and diesel systems. The operation of high rating systems are not benefitted due to several issues such as high maintenance, complex control strategies and low flexibility to change in generation with load change [13]. The use of multi generating units can provide scale benefits to improve operation performances.

The above explained discussions clearly depict the advantages of using multi units of wind and diesel system in electrical system on the basis of their operational and technical benefits. Still, there is a wide scope of analyzing the economic issues of multi units' electrical system as most of such hybrid electrical systems are commissioned for remote areas where consumers are not financially strong. Ref. [15] suggests that a logical pricing of an ancillary service can lead to market liquidity which in turn results in approaching the optimal condition. Voltage control has prime importance in the system along with other ancillary services like system control, regulation, load following, energy imbalance. In isolated hybrid electrical system, voltage can be supported and controlled by the compensators with the help of

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Performance Evaluation of a 4 kW Isolated Solar Powered Lab with IoT Energy Management System

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***Abstract*— A stand-alone solar powered system is an economic & effective alternative to provide electric power at places in remote and difficult terrains. These setups consist of an array of solar panels, dc-dc charge controllers, dc-ac inverters & an energy storing element. This work presents performance evaluation of an isolated photovoltaic (PV) power plant roof-top installation located at Electrical Department block, Krishna Institute of Engineering & Technology, Muradnagar, U.P., India. The aim of this work is to promote the utilization of mini isolated solar power plants to provide electricity to schools & households in rural locations & places with difficult terrains. The scope of this paper is to acquire data from the installed setup & evaluate performance of the system. In this work, we establish an economic energy logging system for data logging & monitoring. This energy management system uses a Wi-Fi module for Internet of Things (IoT), which provides easy access to the data anywhere around the world. After its successful installation, the performance of the stand-alone PV system is evaluated. The experimental data was recorded from 1st August to 30th October, 2018 through the IoT system. The assessed parameters of the PV installation include performance ratio, Capacity utilization factor, inverter efficiency and system losses.**

Keywords- Renewable Energy; Solar energy; Internet of Things; Performance Evaluation; EMS.

I. INTRODUCTION

Electrical power plays an important role in this modern civilization. In order to have proper and sustainable development of a nation, it depends on the availability of energy for industries and human civilization. Along these lines, it can be seen that energy is a fundamental component for the financial improvement of a nation. It is a significant part of our life and it is impossible to imagine our daily routines without electricity. "Yet, over 1 billion people in the world do not have access to electricity. Of this, over 95% live in developing countries and over 84% reside in rural areas" [1]. Meanwhile, the world has the problem of emptying reserves & sky-rocketing cost of fossil fuels. "Additionally, there is special focus on the major problem of Global Warming and pollution. These issues prompt us to reduce our dependence on fossil fuels as the primary source of energy" [1]. Hence, it is high time that the world focus on other sources of energy, and develop and promote renewable sources like solar, wind, geothermal, and others.

Amongst the current renewable energy options, solar power presents the highest potential. "The approximate emission power from the sun is 1.8 x 1011 MW" [1, 2]. Because the nation of India is situated in the sunny belt, it gets 300 days of sunlight. As per NIWE estimates, "India has a solar energy potential of 750 GW" [3]. Under normal conditions, India gets 4-7kWh solar radiation per m^2 [4]. Under the National Solar Mission, "India plans to build large grid connected solar power plants, with a cumulative installed capacity of 20,000 MW by 2020" [5].

Photovoltaic (PV) modules or panels are made from semiconductor materials which have the ability to directly convert sunlight into electricity. Such modules offer us a secure, reliable, low-maintenance and environmentally sustainable source of electricity for a very long time. In order to properly implement a solar PV powered system, prior data, knowledge & understanding of their operation and running performance under varying climatic condition is required [6].

In this work, performance analysis of a 4000W SPV system which was setup on the roof-top of Electrical Department block, Krishna Institute of Engineering & Technology, Muradnagar, U.P., India. on July, 2018 is presented. The setup supplies power to a laboratory in Electrical Department. "The performance of this Photovoltaics (PV) system is assessed on daily basis. Data logging & monitoring is done by Wi-Fi based IoT system that can be accessed from anywhere. In this paper, the development and performance of this PV system is presented for three months from August to October 2018" [1].

The aim of this work is to encourage the utilization of isolated SPV systems in in rural locations & places with difficult terrains. This project has a wide scope for the long-term benefits as well. Once a large data-set is logged, this information can be utilized by creating smart methods to analyze and predict

A Nature-Inspired Metaheuristic Swarm Based Optimization Technique BFOA Based Optimal Controller for Damping of SSR

Rajeev Kumar, Rajveer Singh and Haroon Ashfaq

Abstract In the proposed paper, an innovative method for damping of sub-synchronous resonance in a series capacitor compensated line has been investigated. A nature-inspired metaheuristic swarm based optimization technique BFOA is applied over the optimal control theory for damping and mitigation of sub-synchronous oscillations, with a FACT controller (SVS) connected at the midpoint of a series capacitor compensated network. The analysis has been carried out using IEEE first benchmark model and the entire test system has been simulated using MATLAB software, the simulation results include the eigenvalue analysis which explicitly shows that the application of BFOA on the optimal control theory, the problem of SSR is effectively minimized. Further the time domain analysis for the response curve of rotor angle (Mech-Delta 5) also shows the effectiveness of the proposed BFOA based optimal controller. All the time domain parameters viz., rise time, settling time, overshoot, and peak time is improved by the application of optimal controller which is further improved by the application of BFOA over optimal controller.

Keywords BFOA · Eigen value · Optimal control theory · Static var system · Sub-synchronous resonance · Torsional oscillations · Time domain analysis

1 Introduction

The use of series capacitors in transmission line definitely helps in the improvement of power transfer capability as well as transient and steady state stability limits of power systems and it is also economical compared to the addition of new lines. However, the Series compensated lines having capacitance C have a tendency to produce series resonance at frequencies below the fundamental power frequency. This is called sub-synchronous resonance [1–4]. SSR problem results due to the interaction

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Lecture Notes in Electrical Engineering 607,
https://doi.org/10.1007/978-981-15-0214-9_66

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2nd NATIONAL CONFERENCE
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01 December 2019

CERTIFICATE

This is to certify that Dr./Mr./Ms. Naveen Kumar Assistant Professor of KIET Group of Institutions, Ghaziabad, UP participated in 2nd National Conference on "Wireless Communication and Mathematics" Organized at Punjabi University Guru Kashi College, Damdama Sahib on 01 December 2019. He/She also presented a paper entitled Fuzzy Logic Resource Allocation for OFDM Based Cognitive Radio Networks.

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1st International Conference

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on

Advanced Communication and Computational Technology

(ICACCT-2019)

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This is to certify that Prof./Dr./Mr./Ms. Naveen Kumar Ansari Ahmad

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International Conference on Computational Intelligence and Data Science (ICCIDS 2019)

Capacitance Requirement for Rated Current and Rated Voltage Operation of SEIG Using Whale Optimization Algorithm

Yatender Chaturvedi[a], Sumit Kumar[b]and Vishal Gupta[c]

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Abstract

In today's world non-conventional energy resources are being considered as powerful resources in the field of power generation. To optimize the resources required to generate the power is always be a challenging task. Many meta-heuristic algorithms have been applied for solving the complex optimization problems. Resource optimization is also a n-p hard problem. Whale optimization (WO) is newly developed meta-heuristic performed efficiently for solving complex engineering problems. In this paper WO is used as an optimization algorithm in order to optimize the value of excitation capacitance for rated voltage and rated current operation of self-excited induction generator. The simulation has been carried out on a 5.5 kw rating induction generator and the same has been used for the experimental validation. The results as obtained shows that WO outperformed as compared to other meta-heuristic

*Keywords:*Self-excited induction generator (SEIG), Whale optimization algorithm (WO), Genetic algorithm (GA), Wind energy, balanced operation.Introduction

1. Introduction:

In order to analyze the steady state performance of self-excited induction generators, per-phase equivalent circuit of self-excited induction generator has been adopted which is analyzed using the loop impedance method whereas another approach based on nodal admittance may also be used for the performance analysis of SEIG [1]. The roll

10.1016/j.procs.2020.03.315

Comparison among APSO, PSO & GA for Performance Investigation of SEIG with Balanced Loading

Publisher: IEEE

Yatender Chaturvedi ; Sumit Kumar ; Priti Bansal ; Sushil Yadav **All Authors**

Abstract: In current scenario wind energy is counted as important factor for power generation in order to minimize the gap between generation of power and load demand across the wo... **View more**

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Abstract:

In current scenario wind energy is counted as important factor for power generation in order to minimize the gap between generation of power and load demand across the world. Due to several features, Self-excited induction generators (SEIG) are being actively used for power generation through wind. This paper is targeted on the steady state operation SEIG under balanced operation feeding a resistive load. Three optimization techniques namely APSO, PSO and GA have been considered for the performance investigation of SEIG. The results obtained from APSO, PSO and GA are compared with experimental results on a 5.5 KW rating induction machine. Comparison among optimization techniques APSO, PSO & GA has been made which shows the

References

Citations

Keywords

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effectiveness of optimization techniques as presented for finding of known variables associated with the induction generator.

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Contents

In present scenario energy is the main requirement for the growth and progress of any society. The conventional energy sources like coal, gas etc. used for power generation are pollutant and hazardous which are destroying the nature and our society as well. Continuous reduction in the conventional energy sources used for power generation and its harmful effect on environment are encouraging the researchers to work in the direction of non-conventional energy like wind, solar, geothermal, tidal, biogas etc. Energy generation via renewable energy resources is growing continuously and among them share of energy generation through wind is dominating the others. Currently, wind energy is being used by around one hundred countries in the world on a commercial basis. Among them, the top five countries which are working with energy from wind are China, USA, Germany, India and Spain.

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C.No. NITJSR/EED/EPREC-2020/A/ 160

ISSUE DATE:- 31/05/2020

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This certificate is presented to *Sudhir Kumar Singh*
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in the Electric Power and Renewable Energy Conference-2020 (EPREC-2020)
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SELF-EXCITED INDUCTION GENERATOR: AN INSIGHT

Pragalbha Kant[1], Sunil Kumar[2], Anju Gupta[1], Ruchika Singh[3]

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Abstract- With the ever increasing demand of power for the sustaining of humans civilization and the threat of depletion of conventional energy sources, focus has been centered to the possibilities in renewable energy during the recent past to accomplish the energy requirement. The Self Excited Induction Generator has been identified as an ideal alternative to the well known synchronous generator for meeting the growing demand of electrical energy. As a matter of fact, various researches and experiments have been done to optimize the performance and characteristics of Self Excited Induction Generator. The objective of this paper is to get an insight of the literature of research on Self Excited Induction Generator in the last three decades.

Keywords- Self excited induction generator, Voltage built up, Steady state and transient analysis.

1. Introduction:

To maintain the balance between the supply and demand of electrical power for the much electrified modern world, renewable energy sources like wind energy, solar energy, bio gas etc. have been marked as promising alternatives to replenish the requirement of power [1-6]. The Self Excited Induction Generator, abbreviated as SEIG, being used for the conversion of wind energy into electrical energy, has become a popular alternative source of energy. This is because of some of the outstanding features exhibited by SEIG like its simplicity, robustness, ease of maintenance, lesser unit cost etc. The SEIG is actually an induction machine being operated in the generating mode. A three phase capacitor bank, when connected across the induction machine, provides the excitation, thereby inducing an emf in the winding of the machine. Accordingly, the SEIG, with a three phase capacitor bank as an auxiliary, is called a self excited SEIG. With the three phase capacitor bank being connected, the SEIG becomes the source of power supply in isolated mode. Like any other machine, there are various structural and operational characteristics of SEIG. With the advent of power electronic convertors, the SEIG has been embellished with the precise control over its operating characteristics. The SEIG has some outstanding advantages such as reduced maintenance cost, ruggedness, brushless construction in squirrel cage type, absence of external dc excitation etc.

International Conference on Renewable Power-2020

Certificate of Presentation

This is to certify that Dr./Mr./Ms./Mrs. "Mohammad Shariz Ansari" of "KIET Group of Institutions, Delhi-NCR, Ghaziabad" has presented paper "Techno-Economic Analysis of Diesel/Wind/PV/Battery Hybrid Energy System for Androth Island" in "**International Conference on Renewable Power-2020**" jointly organised by the Electrical Engineering Department, BGSB University, Rajouri, J&K & Electrical Engineering Department, ZHCET, AMU, Aligarh during *July 13 & 14, 2020*.

Ahmed Riyaz
Convener, ICRP-2020

Prof. Atif Iqbal
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Certificate Id:TLAG1U-CE000194

CT | OriginalPaper | Chapter

A Scientific Study on Effect of Polarization in Calculation of Rain Attenuation Using ITU-R Model

Authors: Arun Kumar, Natwar Singh Rathore, Alok Kumar Pandey

Publisher: Springer Singapore

Published in: Renewable Power for Sustainable Growth

Abstract

This paper addresses the current need to work on higher frequency levels for radio wave communication because of need for higher speed requirement in communication system and also because the current frequency spectrum is congested. While establishing radio communication links of higher frequencies it is important to study various problems associated with them. Rain induced attenuation at higher frequency is a major problem. Therefore, a study has been done on rain attenuation and effect of polarization is calculated for six different regions of the world. The simulation results are tested on ITU-R model and various findings throughout the simulation work have been concluded.

Springer Link

Optimal Controller Design for Altitude Control of Modern Airship

Recent Advances in Mechanical Engineering pp 205-211 | Cite as

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Conference paper
First Online: 29 December 2020

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

This paper describes modeling and full-state feedback controller design of airship for stabilization of altitude. The state feedback controller based on linear quadratic (LQ) optimization technique is realized, and performance is compared with pole-placement-based controller. The weighing and regulating matrices are designed and analyzed for the performance of designed controllers for the modern airship. The performance analysis is also presented in this chapter.

Keywords

Full-state feedback controller Linear quadratic regulator Airship

References

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Google Scholar (https://scholar.google.com/scholar?q=Boulet%2C%20J.%3A%20Histoire%20de%20l%E2%80%99H%C3%A9licopt%

Importunity & Evolution of IoT for 5G

Publisher: IEEE Cite This PDF

Anas Ahmad ; Bharat Bhushan ; Nikhil Sharma ; Ila Kaushik ; Saurabh Arora All Authors

Abstract: The following topics are dealt with: Internet of Things; learning (artificial intelligence); data privacy; computer network security; mobile computing; pattern classifica... **View more**

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Abstract:
The following topics are dealt with: Internet of Things; learning (artificial intelligence); data privacy; computer network security; mobile computing; pattern classification; feature extraction; cryptography; cloud computing; Internet.

Published in: 2020 IEEE 9th International Conference on Communication Systems and Network Technologies (CSNT)

Date of Conference: 10-12 April 2020 **INSPEC Accession Number:** 20214113

Analysis of Black-Hole Attack with its Mitigation Techniques in Ad-hoc Network

Ayasha Malik[1], Siddharth Gautam[2], Vikash Kumar Agarwal[3], Nikhil Sharma[4], Ila Kaushik[5]
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nikhilsharma1694@gmail.com[4],ila.kaushik.8.10@gmail.com[5]

Abstract: In wired and wireless communication, providing security is extremely important and challenging. But the flying evolution in communication technology and characteristics of wireless network make this issue even more challenging. In Adhoc network, there is a huddle of autonomous mobile nodes; which dynamically form a temporary multi-hopped, peer-to-peer radio network, without any use of predefined infrastructure. Lack of fixed infrastructure, use of wireless link and mobility of nodes make Ad-hoc networks extremely receptive to rival's hostile attacks, blackhole attack being one among them. This paper includes a brief description of black hole attack and presented a comprehensive survey of its prevention techniques as given by some researchers. The main aim is to find how, when, and why an Ad-hoc network was compromised or involved in commitment with blackhole attack. At last we used ACO (Ant Colony Optimization) technique to prevent the network from blackhole attack by using AOMDV protocol with fitness value (FV-AOMDV). The fitness value is used to find the optimal and secure path from source node to destination node. Conclude the result on the basis of some performance metrics i.e. Packet delivery ratio, Delay, Generated packets and Received packets by using NS-2 simulator. The observed results prove that there is a substantial.

Keywords: *Wireless Network, Blackhole Attack, ACO, AOMDV, Intrusion Detection using Anomaly based Detection*

1. INTRODUCTION TO WIRELESS NETWORKS

A wireless network is a network which create by computer i.e. nodes by using wireless data connection between them. Wireless communication is a method by which cost of wire is reduces [1] Wireless medium is playing a vital role to provide communication to real world by allowing user to take information and service electronically or digitally, spite their topographical site. Wireless connection/communication provide by two types: Infrastructure based (contains Access point) and Infrastructure less (without access point). MANET is infrastructure less network [2]. The wireless links used for interconnection may be terrestrial microwave, communication Satellites, radio and

Security and Trust Issues in Internet of Things: Blockchain to the Rescue

edited by Sudhir Kumar Sharma, Bharat Bhushan, Bhuvan Unhelkar

APHONIC'S VOICE: A HAND GESTURE BASED APPROACH TO CONVERT SIGN LANGUAGE TO SPEECH

Surendra Kumar Keshari[1], Shristi Tyagi[2], Niketa Tomar[3], Smiti Goel[4]
[1,2,3,4]KIET Group of Institutions, Ghaziabad, India

***Abstrac*t -- As everyone knows that language has always been a barrier in the path of communication for the people speaking different languages. A person going to some other country can learn a new language or carry a dictionary to communicate but, specially-abled people such as deaf or profoundly deaf person can only use sign language for communication. In a world where people barely understand this language it does not helps a lot in curbing the issue. So, the purpose of this proposed system is to develop a translation tool which can reduce the communication gap by converting the real-time gesture-based signs to text and finally to speech.This paper will first at discuss the design to recognize the hand gesture as it is one of the fastest way to communicate. And further the discussion will be about recognizing the digit and perform operations in addition to recognizing the English alphabets to form words. The paper reviewed the current study status of application aiming to recognize the hand gestures, symbols and movements to convert it into numbers and alphabets, and further into words and then sentences. According to the research the application will work as a medium in between an aphonic person and a normal person or vice versa. This paper shows the status of the application, customized hand gestures, the methods, analyzing the strength and week points and lists all the challenging problems in current research of hand gestures used for aphonic people school etc.**

Keywords: **Hand Gesture, Study Status, Application, Aphonic people school**

I. INTRODUCTION

A gesture can be described as the movements of hands or faces that express an inspiration or a feeling such as arms crossed over the chest, nail-biting or stroking chin, etc. Apart from body language, hand gestures can be of great help, especially for the deaf, mute or profoundly deafpeople.

The deaf, mute or profoundly deaf person use sign language to communicate with other peoples. However, it is only those people can understand the language who has undergone some special training to learn the sign language. Sign language makes the use of hand gesture along with other non-verbal cues to convey their thoughts. It makes the use of hand shapes, alignment, movements of hands, arms and facials expressions to convey the speaker's thoughts. The notion behind this proposed system is to develop a hand-gestures to speech conversion desktop-based application. The system provides the user i.e., deaf, mute and profoundly deaf person the ability to perform calculations based on hand gesture and recognize alphabets to form words. Further, it conveys the result to the normal people by converting the text result tospeech. Following administrative activities should be automated as follows: -

1. Gesture Calci
2.
a. Instructions
b. Start Operation
1. Input through camera
2. Gesture to digitsconversion
3. N-Digitsformation
4. Arithmeticoperations
5. Text digits to speechconversion

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A smart System for Fake News Detection Using Machine Learning

Publisher: IEEE

Anjali Jain ; Avinash Shakya ; Harsh Khatter ; Amit Kumar Gupta **All Authors**

Abstract: Most of the smart phone users prefer to read the news via social media over internet. The news websites are publishing the news and provide the source of authentication. ... **View more**

Metadata

Abstract:

Most of the smart phone users prefer to read the news via social media over internet. The news websites are publishing the news and provide the source of authentication. The question is how to authenticate the news and articles which are circulated among social media like WhatsApp groups, Facebook Pages, Twitter and other micro blogs & social networking sites. It is harmful for the society to believe on the rumors and pretend

Black Hole Attack and Its Security Measure in Wireless Sensors Networks

Handbook of Wireless Sensor Networks: Issues and Challenges in Current Scenario's pp 401-416 | Cite as

Chapter

First Online: 09 February 2020

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Abstract

Brain Tumor Segmentation Using OTSU Embedded Adaptive Particle Swarm Optimization Method and Convolutional Neural Network

Data Visualization and Knowledge Engineering

pp 171-194 | Cite as

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By Abhishek Sharma, Nikhil Sharma, Ila Kaushik, Santosh Kumar, Naghma Khatoon

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ABSTRACT

< Previous Chapter (chapters/edit/10.1201/9781003054115-13/biometric-monitoring-healthcare-iot-systems-using-deep-learning-shefali-arora-aveen-bhola-gurjot-kaur)

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Comparison of COSYSMO Model with Different Software Cost Estimation Techniques

Publisher: IEEE Cite This PDF

Neha Yadav ; Neha Gupta ; Mukul Aggarwal ; Aruna Yadav **All Authors**

Abstract: Cost Estimation of any software is process of evaluating the estimating cost and effort which is must necessary to build any software system or project for increasing the... **View more**

Metadata

Abstract:
Cost Estimation of any software is process of evaluating the estimating cost and effort which is must necessary to build any software system or project for increasing the output. The basic input is the cost drivers set and the size of code and the output is the effort which is calculated in terms of Person-Months (PM's). To estimate cost for software

Applicability of WSN and Biometric Models in the Field of Healthcare

Nikhil Sharma (HMR Institute of Engineering and Technology, Delhi, India), Ila Kaushik (Krishna Institute of Engineering and Technology, India), Bharat Bhushan (HMR Institute of Technology and Management, Delhi, India), Siddharth Gautam (HMR Institute of Technology and Management, Delhi, India) and Aditya Khamparia (Lovely Professional University, India)

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ost important ingredient in human life. Health is wealth is the most frequent used proverb. A healthy person can perform its entire task with full enthusiasm and great energy and can solve all problems as mind is a powerful weapon, which controls all our functioning. But now due to change in our lifestyles, we are becoming prone to all kinds of health hazards. Due to unhealthy mind, we are not able to perform any tasks. Humans are becoming victims of many diseases and one of the most common reason for our degradation in health is stress. In this chapter, the authors present role of WSN and biometric models such as two factor remote authentication, verifying fingerprint operations for enhancing security, privacy preserving in healthcare, healthcare data by cloud technology with biometric application, and validation built hybrid trust computing perspective for confirmation of contributor profiles in online healthcare data. A comparison table is formulated listing all the advantages and disadvantages of various biometric-based models used in healthcare.

Chapter Preview

Top

Security and Privacy Issues in IoT Devices and Sensor Networks

Advances in ubiquitous sensing applications for healthcare

2021, Pages 211-243

Chapter 10 - Blockchain as a solution for security attacks in named data networking of things

Sukriti Goyal[a], Nikhil Sharma[a], Ila Kaushik[b], BharatBhushan[c]

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https://doi.org/10.1016/B978-0-12-821255-4.00010-9

Abstract

In the world of technology, the Internet of Things (IoT) is a network to link entire things, that is, people, devices, and systems, with each other through an approach of common networking. This technology constructed a way, where many of the routine devices or things are interrelated and easily communicated with, their surroundings to gather or transfer the information over the network without the need of any human-to-system communication or human-to-human communication. It is born with features such as dynamics, scalability, and heterogeneity, and only that network solution can adapt to it which has strategy to incorporate its features. And here comes data centric interaction paradigm, it applies an approach of data naming to comprise the dynamics, scalability, and heterogeneity features to adapt to IoT and composes NDN of things, that is, Named Data Networking of Things (NDNoT). This paradigm

< Security and Trust Issues in Internet of Things (https://www.taylorfrancis.com/books/mono/10.1201/9781003121664/security-trust-issues-internet-things?refId=b1802b96-ca2a-4bee-89a2-a28a28d7fb17)

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Chapter

Blockchain as a Lifesaver of IoT

Applications, Security, and Privacy Services and Challenges

By Sukriti Goyal, Nikhil Sharma, Ila Kaushik, Bharat Bhushan, Abhijeet Kumar

Book Security and Trust Issues in Internet of Things (https://www.taylorfrancis.com/books/mono/10.1201/9781003121664/security-trust-issues-internet-things?refId=b1802b96-ca2a-4bee-89a2-a28a28d7fb17)

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ABSTRACT

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Security review in Software Defined Network

Chaudhary	Mamta Bhusry	Rkagarwal
Dr. Anu Chaudhary	**Dr. Mamta Bhusry**	**Dr. R.K. Agarwal**
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Architectural Model of Security Threats & theirCountermeasures in IoT

Publisher: IEEE Cite This PDF

Tanishq Varshney ; Nikhil Sharma ; Ila Kaushik ; Bharat Bhushan **All Authors**

Abstract: Internet of Things (IoT) depicts a future technology where devices establish a connection with internet for building the intelligent structural system and to implement se... **View more**

Metadata

Abstract:

Internet of Things (IoT) depicts a future technology where devices establish a connection with internet for building the intelligent structural system and to implement self-configuration system IoT is an internetworking of devices which are physically present, function of that device is to sense the data In today's scenario IoT involves with different

Authentication & Encryption Based Security Services in Blockchain Technology

Publisher: IEEE

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Diet Recommendation for Hypertension Patient on basis of Nutrient using AHP and Entropy

Publisher: IEEE

Cite This PDF

Surbhi Vijh ; Deepak Gaur ; Sushil Kumar **All Authors**

Abstract: Hypertension is named as silent killer. It is considered as one of alarming factor for chronic kidney disease, heart failure, impaired vision, Ischemic heart disease, Str... **View more**

Metadata

Abstract:
Hypertension is named as silent killer. It is considered as one of alarming factor for chronic kidney disease, heart failure, impaired vision, Ischemic heart disease, Stroke etc. Hypertension is divided into systolic and diastolic blood pressure. According to studies 90-95% cause of hypertension is change in lifestyle therefore Diet plays essential role to

Evaluation of Accidental Death Records Using Hybrid Genetic Algorithm

Proceedings of the International Conference on Innovative Computing & Communications (ICICC) 2020

6 Pages
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ITER-SOA

Date Written: March 28, 2020

Abstract

Hybrid Genetic algorithms are becoming reasonably important by its ever-increasing demand to solve real world pr
results. In this paper, we present combined approach of support vector machine regression and linear regression fo
been taken from Government of India, which is further divided into various sub categories. Error rate has been calcu
as female candidates has been reviewed by using age as one of the distinguishing parameters.

Keywords: Hybrid Genetic Algorithms, Support Vector Machine Regression, Linear Regression, Random Forest Clas

Evolution of IoT & Data Analytics using Deep Learning

Publisher: IEEE

Ratik Tiwari ; Nikhil Sharma ; Ila Kaushik ; Archit Tiwari ; Bharat Bhushan **All Authors**

Hand Written Digit Recognition using Machine Learning

Publisher: IEEE

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Intrusion Detection and Security System for Blackhole Attack

Publisher: IEEE

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IOT Based Smart Polyhouse System using Data Analysis

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Adesh Kumar Pandey ; Minakshi Chauhan **All Authors**

Abstract:A large part of the world's population depends upon agriculture industry for its source of livelihood. The growth of agriculture industry is bound to the two major parame... **View more**

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Abstract:
A large part of the world's population depends upon agriculture industry for its source of livelihood. The growth of agriculture industry is bound to the two major parameters; quality and quantity yield of the crops. Polyhouse farming is an excellent method which enables the production of crops with minimum resources and efforts and maximum yield by providing a controlled condition environment. Polyhouse is a methodology to grow

Modeling the Optimal Ways for Early Diagnosis of HIV-AIDS and its Preventive Measures

Proceedings of the International Conference on Innovative Computing & Communications (ICICC) 2020

5 Pages
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Directorate of Education, Govt. of NCT

Date Written: May 14, 2020

Abstract

The HIV-AIDS, which is Human Immunodeficiency Virus-acquired immunodeficiency syndrome, is a disease of glol awareness about the disease spread. This disease infects the immune system of the human body and gradually dest diagnosis of HIV/AIDS. The Government, under the "Test and Treat policy for HIV" provides free treatment to HIV p delivery to obtain efficient and effective operations of the healthcare systems. There is high expectation regarding th of various models proposed to early diagnosis of HIV/AIDS patients and highlights their efficiency.

Keywords: CD4 T-cells, Antiretroviral therapy, Long-term nonprogressor, Gene coexpression, HIV disease progressi

Performance Measurement Using Different Shortest Path Techniques in Wireless Sensor Network

Publisher: IEEE

Nikhil Sharma ; Ila Kaushik ; Nanhay Singh ; Ravinder Kumar **All Authors**

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Computers are being essential part of our daily lives. Different solutions came into existence for exchanging information. One of the suited networks based on wireless standard is wireless sensor networks (WSN). These networks comprise of nodes which are randomly distributed in any environment. They operate over radio frequency and

Precedence & Issues of IoT based on Edge Computing

Publisher: IEEE

Sukriti Goyal ; Nikhil Sharma ; Ila Kaushik ; Bharat Bhushan ; Abhijeet Kumar **All Authors**

Abstract: In the network of IoT, a huge amount of data is frequently generated, major messages through complicated networks serving device-to-device communications are swapped and ... **View more**

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Abstract:

In the network of IoT, a huge amount of data is frequently generated, major messages through complicated networks serving device-to-device communications are swapped and also, sensitive smart world frameworks are controlled and monitored by thousands of gadgets and sensors. To extenuate the acceleration of overcrowding of resources in the network, as an approach edge computing, has risen as a modern approach to

Privacy Issues & Security Techniques in Big Data

Publisher: IEEE

Archit Tiwari ; Nikhil Sharma ; Ila Kaushik ; Ratik Tiwari **All Authors**

Abstract: Big Data, as the name suggests is a process of collection of information in a very large amount and storing it in a multidimensional database of various organizations and... **View more**

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Abstract:

Big Data, as the name suggests is a process of collection of information in a very large amount and storing it in a multidimensional database of various organizations and thereby performing Analytical operations on it to increase their efficiency and enhance their ability of decision making. Strategies can be made using this technology which uses real time using Big Data Analytics. The main advantage of the technology of big data is

Producing Energy Using Blind Man Stick

Publisher: IEEE

Depender Kumar Soni ; Nikhil Sharma ; Ila Kaushik ; Bharat Bhushan **All Authors**

Abstract: We all are familiar with the problems a blind person faces while performing several daily life activities. These problems are generally related to walking on roads, walki... **View more**

Metadata

Abstract:

We all are familiar with the problems a blind person faces while performing several daily life activities. These problems are generally related to walking on roads, walking on ramps, movement in staircases, looking for path in crowded streets and market places and many other situations. Of course, many of us come ahead to help them by guiding their way, but sometimes it becomes a matter of self-respect, or say, the person is not

Smart and Sustainable Intelligent Systems

Chapter 25

Study of Various Intrusion Detection Systems: A Survey

Minakshi Chauhan,Mohit Agarwal

Book Editor(s):Namita Gupta,Prasenjit Chatterjee,Tanupriya Choudhury

First published: 24 March 2021
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Summary

Nowadays, Internet-based technologies are extensively being used to transfer, store and process the information. The massive growth of information over the Internet offers a rich environment to the attackers and intruders to expand the attack surface. In Information and System Security, intrusion detection is the act of detecting such actions that attempt to compromise the security of computer systems; Confidentiality, Integrity or Availability of a computer resource. Intrusion Detection is the process of observing and analyzing the activities happening in a computer system to identify any security violating activities. In this paper, the structure of IDS, different types of intrusion detection techniques and various types of attacks have been presented. This paper also presents the comparative study of various intrusion detection systems based on techniques used, various parameters of detection performance and their use in different domains.

Taxonomy of Attacks on Web Based Applications

Publisher: IEEE

Cite This PDF

Ankit Singh ; Aditi Sharma ; Nikhil Sharma ; Ila Kaushik ; Bharat Bhushan **All Authors**

Procedia Computer Science
Volume 167, 2020, Pages 373-381

Time Series Data Prediction using IoT and Machine Learning Technique

Raghavendra Kumar[a], Pardeep Kumar[b], Yugal Kumar[b]

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https://doi.org/10.1016/j.procs.2020.03.240

Abstract

Time series analysis and prediction have been widely accepted in various domains from last two decades. Business analytics, Medical drugs & pharmaceutical, Dynamic Marketing, Weather forecasting, Pollution measures, nancial portfolio analysis and Stock market prediction are the favorite domains among research communities under time series analysis. Since air quality is one of the paramount factors which make life possible on earth and monitoring air quality data as time series analysis is a one of prime area. The most a ected air quality parameters on health are carbon monoxide (CO),carbon dioxide (CO2), Ammonia(NH3) and Acetone ((CH3)2CO). In this paper we have taken the sensor's data of three speci c locations of Delhi and National Capital Region (NCR) and predict air quality of next day using linear regression as machine learning algorithm. Model is evaluated through four performance measures Mean Absolute Error (MAE), Mean Square Error (MS

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CURRENT STATUS OF ARTIFICIAL INTELLIGENCE IN EYE CARE

Akash Aggarwal[1], Roma Ghai[1], Sneha Chaudhary[1]
Department of Pharmacology[1], KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad, UP-201206 (India)

Abstract
While population ageing has become a huge demographic phenomenon all over the globe, patients with eye problems are expected to rise drastically. Early treatment and effective eye disease care are of great importance to avoid vision loss and improve the quality of life. Traditional methods of diagnosis rely heavily on the clinical experience and expertise of physician's resulting in high error rates.
An important area in computer science is Artificial intelligence (AI). AI has an extensive implementation across many medical sectors and is useful especially in ophthalmology and therapy for several eye defects such as Corneal ectasias ,Glaucoma, Macular degeneration related to age, Diabetic retinopathy ,Cataract surgery, prediction of future high myopia and estimation of lens strength or intraocular disease. Therefore, the AI has the ability to radically change the current pattern of diagnosis of disease and generate a substantial clinical impact. U.S. Food and Drug Administration had approved the first advanced A.I diagnostic tool "IDX-DR" to diagnose Diabetic Macular Oedema and in the meantime, low-cost fundus camera based on smartphones such as DIYretcam, T3retcam was also created for imaging analysis. The article discusses how A.I approaches can deal with these complications and illnesses.
Keywords: cataract surgery, diabetic retinopathy, diagnostic methods, fundus camera, glaucoma

Introduction
Artificial intelligence is the analysis of complex information processing issues, mostly rooted in a type of biochemical data processing. The subject's goal is to recognize and solve interesting and solvable problems in the processing of information [1].When new breakthroughs and innovations from technology firms and scientists are being revealed, AI has recently re-entered the science and public consciousness. Apart from its ornamentation and aspirations in science fiction, AI is fundamental to a computer industry, which strives to recognize and create intelligent structures, mostly implemented as software programs. The history of AI is long and goes back to a meeting in Dartmouth in 1956 when the term was first used[2]. AI systems have recently sent massive waves of healthcare, and are currently debating how AI doctors can replace human medical practitioners. Human doctors will not be replaced by machines in the foreseeable future. AI will definitely help doctors make better clinical decisions or even substitute human judgment in certain healthcare fields[3].
In the field of ophthalmology AI primarily represents the recognition of medical imaging and supporting diagnosis, particularly in blind-causing diseases. The execution of the AI technology mainly depends on machine learning which consists of a lot of input experimental mathematical algorithms and models[4]. Fundus photography is a non-invasive approach by clicking on images of the retina, optic disks and macula using retinal cameras. It can diagnose and monitor diseases including DR, glaucoma, retina and macular degeneration related to age and plays a vital role in recognizing preventable blindness causes[5].

A.I. in Glaucoma
Glaucoma is the third most visually impaired eye disease in the world and has a critical effect on global blindness. High intraocular pressure, optical nerve head (ONH), retinal nerve fiber (RNFL) defect and gradual loss of view in patients with glaucoma is affected. The automatic detection of glaucoma-related features has considerable significance for its timely interpretation[6].The Cup to disk (CDR) optical ratio is ideal for detecting glaucoma in patients. AI models can calculate CDR to help diagnose glaucoma at an early stage [7]. Deficiency of RNFL can be the first symptom of glaucoma. During recovery from glaucoma, visual field (VF) defect is an important visual function improvement. The use of ML approaches will substantially improve preperimetric glaucoma VF detection from healthy VFs[8The world's second leading cause of blindness is glaucoma. In 2010 the population affected 60.5 million, and it is estimated that this figure will hit 79.6 million by 2020. In reality, no cure exists and once this occurs, visual impairment is permanent. Early detection and treatment can delay or avoid the disease's progression and can protect against serious vision loss. Several investigators have studied whether glaucoma dependent on retinal images can be immediately identified. Historically, glucose optic neuropathy, including severe or extreme myopia, DR and AMD, with established visual disabilities was the main reasons. Pre-perimetric glaucoma and healthy eyes used in earlier studies different specific forms of perimetry[9].
Chronic primary open-angle glaucoma (POAG) is untreatable neuropathy in combination with normal visual field degeneration and IOP elevations. POAG can lead to permanent loss of vision without early diagnosis and treatment. POAG screening and monitoring are important [10].An AI research in 2013 investigated the development of POAG in 180 patients, with various MLCs and individual characteristics (73 healthy eyes, 107 glaucoma progressed eyes). The features of RNFL alone offered enough details to distinguish between stable and early moderate progression in POAG for MLC to differentiate.Random forest vine and lazy K star were the most probable MLCs. To build cost-effective, flexible or more accurate decision-making processes than current methods AI would use sets of data to screen and guide [11].
There are so many people who are at a higher risk of glaucoma than others. They include patients of diabetic, hypertension, migraine, myopia, hyperopia, and people who are above 40 years12]. Three types of glaucoma are found normally that is, open angle glaucoma, low tension glaucoma, and congenital glaucoma [13].

Diagnosis of glaucoma
A technique scanning laser polarimetry (SLP) is used to evaluate the RNFL for early detection of glaucomatous injury. This system has many potential benefits. Because the RNFL area expects less biological variation from the optic nerve head, a narrower range for standard RNFL measuring can be described by physicians[14]. Another technology laser polarimetery that enables light (780 nm) using a polarized laser diode. It is a confocal ellipsometric laser that tests the absolute delay of the retina and calculates the RNFL (micron) thickness point to point in the peripapillary area from these results [15].
The technique recently used for diagnosis of Glaucoma is the optical coherence tomography (OCT). OCT is a high-resolution technique that produces direct retina observations and RNFL measurements with a high level of test resistance variability.
For the identification of glaucoma AI employs artificial neural networks (ANN). ANN owe their name to the parallelism with the biological nervous system in structure and function. It is composed of a community of neurons. The neuron receives different inputs from other neurons at the same time and adds them according to the weights associated with each connection, generating a response that depends on the amount of inputs received and the weights associated with the links [16].

A.I in Cataract
In computational medicine AI holds great assurance. Much attention has been paid to the development of an all-round expert medical robot with high accuracy in diagnostics[17].Cataract is a cloudy-lens disease that affected

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VARIOUS TYPES OF QUALITY AUDITS IN PHARMACEUTICAL INDUSTRY

Alankar Shrivastava[1], Abhishek Sharma[2]
[1]Associate Professor, Department of Quality Assurance, KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad
[2]Research Scholar, Department of Quality Assurance, KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad

Abstract
Auditing is one of the essential function in pharmaceutical industries. It is one of the essential part of Quality Management System. Quality audits are generally executed by external or independent experts or any team designated by management. Audits can also be performed for suppliers and contractors also. A well-executed quality audit results in overall improvement of the process and ultimate beneficial for the organization in many ways. The weakness and strengths of the process and quality assurance of any procedure can be easily understood by quality audits. This may be the reason that quality audits comprise important part of GMP system not only for the improvement of the internal procedure but also to comply with regulatory authorities. This article includes principle, objectives, various types of quality audits and preparation of audit reports in pharmaceutical industry. The presented review is not only beneficial for academicians but also to the personnel involved directly or indirectly related to audits in pharmaceutical industry.
Keywords: Quality audits, Pharmaceutical industry, Types of Quality audits, GMP, Quality assurance, Quality defects

1. Introduction
The purpose of conducting audit is to verify the validity and reliability of the information: and to provide assessment of control over any procedure or process. It provides basic the understand organizations control over the quality of its products and processes[1],[2]. The audit in simple term defined as:
"The inspection of a process or a system to ensure that it meets the requirements of its intended use"[1]
ISO defines quality audit as:
"Systematic, independent and documented process for obtaining audit evidence and evaluating them objectively to determine the degree to which the verification criteria are met".[3]
Quality audits should not be considered as threats or review of quality of products rather should be one of the mechanism for quality control in pharmaceutical industry. The results of audits and comments of experts for corrective action provides basis for the improvement of quality of process or products. Thus it should involve all parties to work in accordance with established rules to gain the maximum benefits of this practice. The quality audits also serves means to fulfilling the objective of management for assessment of compliance with the establish regulatory guidelines and also provides basis for continuous improvement program through feedback of every successful audit. Any pharmaceutical company capable of manufacturing drug should be capable of demonstrating with absolute reliability under given optimum conditions with uniformity allowing perfect reproduction of batches. Audit of both compliance and performance is essential part in both ISO and in FDA guidelines.[1]

2. Goals of an audit [2]
The important goal of quality audit is to evaluate existing activities and documentation process ensuring meeting required standards and compliance. Independent evaluation of strength and weakness of quality management system always proved to be in favour of industry because of sustain improvement of the process.
Quality assurance and quality control are tow essential process forming backbone of quality programs of pharmaceutical industry and thus proper control of these process will be beneficial in terms of quality end product and customer satisfaction. With proper planning and execution of Quality Audits any organization can achieve its goals easily. Proper compliance will certainly help in building of brand reputation and avoiding fines, deteriorate public reputations, court fines etc.

3. Benefits of auditing [1]
The major benefits of an effective audit system can be summarized as follows:

- Quality management system management
- Weak points detection in advance through identification of deviations of process or situations
- Minimize quality related issues in product
- Periodic data review decreases deviations and improved understanding about process
- Optimization of output through successful audits
- Continuous improvement of process
- Combination of improvement of company's performance, compliance and successful audits will reduce the failure cost
- Improvement of understanding on quality related aspects and increase level of compliance
- Mutual confidence between partners, increase in trade and reliability of product

It is important to ensure preparation of clear documentation of procedure of conduct of all kinds of audits. There should be clear objective with brief explanation about the reason of conduct of audit. Some more points of document shall be:
Frequency of Audit: Method of establishing frequency of audit should be explained. Frequency of audit should be followed and set according to the requirement.
Responsibilities: The responsibilities of every team member od audit should be properly defined and every person should be clear about the procedures and interpretation of operations that are being audited. If required they should be well equipped with the tools e.g. tools related to sampling etc.
Documentation: Proper document should be prepared for every audit which is also help auditors to review any process and also important for regulatory perspective.

4. Types of audits
There are three types of quality audits
4.1. Internal Audits
4.2. External Audits
4.3. Regulatory Audits
4.1. Internal audits:
The other names of this type of audit are First party audit or self audit. The auditors and the process or product being audited belongs to same company. Self audit helps to achieve goals of pharmaceutical industry in a professional way by advising them in improvement of any procedure

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THE APPLICATION AND UTILIZATION OF GAMMA SCINTIGRAPHY AS AN IMPORTANT TOOL FOR EVALUATING TARGETED DRUG DELIVERY SYSTEMS

Anamika Rajput[1], Debaprasad Ghosh[2], Anushka Jain[3], Ashu Mittal[4], Jagannath Sahoo[5]
Department of Pharmaceutics[1], KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad, UP-201206 (India).

Abstract
Gamma- scintigraphy has been derived from the Latin word scintilla, meaning "spark". It is also known as gamma scan. It is an identification test in nuclear medicine. In this, radioisotopes are attached to a drug(radiopharmaceuticals) that are taken internally. It then travels to particular organ or tissue and the emitted gamma radiation is captured by external detectors (Gamma cameras) to form two- dimensional images in similar process to the capture of x-ray images. Gamma Scintigraphy is a widely used technique for development and evaluation of targeted drug delivery systems. The radio labeling is generally achieved by the introduction of an appropriate technetium- 99m or indium- 111 labelled radio pharmaceutical into the dosage form. Pharmaco-scintigraphy provides a sequence related to the site of drug release and absorption. Gamma scintigraphy also provides the information related to the disposition, diffusion and moment of the drug in to the body. Gastro intestinal transit measurement can be accessed through Pharmaco-scintigraphy technique. Pharmaco-scintigraphy can also be used to study multiple-dose study. This review discusses the implications of gamma scintigraphy in the estimation of pharmaceutical formulations including the past applications, current uses and future possible scopes of gamma scintigraphy in the assessment of the performance of various targeted drug delivery systems.

Key words: Gamma-scintigraphy, indium-111, iodine12, technetium-99m.

Introduction

Gamma scintigraphy method is primarily used for the analysis of the functioning of the organ, perfusion, receptor binding, etc. It also provides us with some anatomical insight. Gamma scintigraphy is a major tool that involves the introduction of gamma emitting substance [1]. Visualization is possible by introducing some of the gamma emitting radionuclides internally [1]. The most commonly used radionuclides are Iodine 123, Samarium 153, Indium- 111 (111 In) and technetium- 99m (99m Tc).

Gamma scintigraphy has also been used in the estimation of various drug delivery systems. It is usually applied to evaluate the dosage form intended for the respiratory tract and gastrointestinal tract [1]. For evaluating the amount of drug reaching the lungs, the technique used is called the planar imaging. It is also known as two-dimensional gamma scintigraphy [1]. Gamma scintigraphy can be classified into several different individual techniques, one of which is SPECT (Single photon emission computed tomography). The SPECT technique involves the introduction of cameras equipped with three-dimensional imaging data [2]. SPECT is further sub-divided into two different types based on the resolution, these are Low Resolution Computed Tomography (LRCT) and High-Resolution Computed Tomography (HRCT) [2]. SPECT is more advantageous than 2-D gamma scintigraphy because it allows the determination of regional lung deposition with high accuracy [3]

Gamma scintigraphy also plays an important role in oral drug delivery. Active pharmaceutical ingredients are usually given to the patients in the form of medications generally formulated as either solid, semisolid or liquid dosage forms based upon optimum route of administration, intended target of action, patient palatability etc. So,during the design and development of a particular dosage form, it is necessary to optimize the formulation system correctly in order to obtain the approval for the formulation from the concerned regulatory authorities [5].

This article primarily emphasizes on discussing the methodology, application and utilization of gamma scintigraphy for evaluating the targeted drug delivery system, along with its advantages and disadvantages. This article also provides some brief information regarding the recent advances and future prospects of this technique.

Methodology

Gamma scintigraphy relies heavily upon the detection of the radiation emitted from a radionuclide. The major equipment being used for this purpose is known as a gamma camera. It is equipped with a scintillator which transforms the gamma radiation into an emission of light. The most widely used scintillator is a monocrystal of sodium iodide activated by thallium [4]. The thickness of the crystal is limited to approximately 10 mm to optimize the detection efficiency. Joined to the crystal are the hexagonal array of photomultiplier tubes. They detect the light pulses. The whole arrangement is sheathed inside lead to shield the crystal from superfluous radiation[5]. A collimator made up of lead is placed straight away in front of the crystal to prevent any radiations arriving at angle. Electronic circuitry is used for amplifying the light signal produced in the crystal and for quantifying the intensity of the incident gamma ray and also for locating its origin. Thus, it becomes possible to determine the distribution of the tracer on an image formed as matrix pixels [4].The pulse height analysis improves disparity resolution of gamma camera systems by somewhat eliminating scatter from the final image. Photons travelling directly from their point of origin will produce energy or Z pulses over a relatively narrow range [6]. The ability of a gamma camera to record a diagnostic image depends on the scientific capabilities of the gamma camera and on patient factors such as body habitus [7]. Nowadays, many of the population has tended toward a higher body mass index due to prevalence of obesity amongst the urban and semi-urban populations [8].

While comparing the different gamma-imaging agents,^{67}Ga has several properties which are unacceptable for the clinical nuclear medicine diagnostic imaging. These include the unacceptable physical imaging characteristics of immense high energy emissions (397 keV and 300keV) and a 78-h half-life [11].Indium-111 has farbetter physical imaging characteristics compared toGallium-67 with lower energy emissions (247keV and 172 keV) and a slightly lesser half-life of 67-h. But regrettably Indium-111is comparatively expensive because it is being created by a cyclotron [11].

In nuclear medicine,^{99m}Tc is the most widely used gamma-imaging isotope as about 70% of all gamma-scintigraphy procedures are being performed by using this isotope. It has an ideal short half-life of 6-h and gamma photon energy of 140 keV. Due to these properties the emitted photons of^{99m}Tc escapes the body of the patient without an excessive dose of radiation being absorbed by the body tissues.^{99m}Tc is being generated by its precursor ^{99}Mo.

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ANTI-INFLAMMATORY AND ANTI-ARTHRITIC ACTIVITY OF CHLOROFORM AND ETHANOLIC EXTRACT OF *Punica Granatum Linn.*

Anjali*[1], Praveen K Dixit[1], Ashish[1]

[1]KIET School of Pharmacy, KIET Group of Institution, APJ Abdul Kalam Technical University, Delhi NCR, Ghaziabad, India

Abstract

The study was performed to determine the anti-inflammatory and anti-arthritic action of *Punica granatum's* seed extract using in vitro models as well as their phytochemical analysis. *Punica granatum's* seeds were extracted with ethanol and chloroform solvent and by using HRBC membrane stabilization method and protein denaturation inhibition test in-vitro anti-inflammatory potential was evaluated significantly. The results of the study demonstrate that the *Punica granatum* extracts contain various active constituents having anti-inflammatory activity and HRBC (Human red blood cell) membrane stabilization. Thus, the protein denaturation inhibition method and HRBC membrane stabilization assay showed the significant concentration/dose dependent activity. The result is compared with the reference drug Diclofenac sodium. The present study examined that the ethanolic and chloroform extract of *Punica granatum* seed as anti-inflammatory potential due to presence of alkaloids, gallic and ellagic acids, steroids, tannins, terpenoid etc. and has given a pharmacological evidence for the use of *Punica granatum* as an anti-inflammatory agent.

Keywords: Punica granatum, Anti-inflammatory activity, HRBC membrane stabilization method, protein denaturation inhibition method.

Introduction

Plants has been used for medicinal purposes since prehistoric period and the medicinal plants always have a significant role in developing countries for potent therapeutic agents. Representation of rich in culture, natural and traditional biodiversity gives a unique opportunity for researchers on drug discovery all over India.

Inflammation is a host defence mechanism and a reaction to foreign substance, irritation, and infection to destroy and eliminate physical dysfunction. During inflammatory process, an enzyme, called Lysosomal enzymes is released to cause various disorder that leads to lipid peroxidation of membranes and damage the macromolecules for tissue injury.[1]

The responses involved in inflammation usually changes with time and follow some phases too. The first and rapid phase involved increase in blood flow, oedema, vasodilation, and pain. It mainly occurs within few seconds. The acute and chronic inflammatory phase involved moderate and dramatically increased inflammatory mediators respectively.[2]

Rheumatoid arthritis (RA) is defined as an autoimmune diseases (systemic) that distinguish by destruction in cartilage and bone with chronic inflammation. It mainly causes synovial cell's hyperplasia and angiogenesis of influenced joints. The chronic inflammatory mediators that play an important role in this are TNFα, IL-6, CD4 cells, and macrophages.[3]

Punica granatum L. (Pomegranate or Anar) is a deciduous shrub or small tree, growth of 1.8-4.6m tall, belonging to the family Punicaceae. The fruits of pomegranate itself possess various therapeutically important constituents and many of these constituents are effective in treatments of various diseases.[4] According to the recent and advanced studies, it was found that the Pomegranate whole plant parts contains various chemical constituents like tannins, saponins, ellagic acid, gallic acid, triterpenoids, polyphenol including punicalin, punicalagin, and anthocyanins, etc.[5] All these chemical constituents have nutritional and medicinal use in treatment of arthritis, obesity, cardiovascular disease, neuroprotective, male infertility, erectile dysfunction, infant brain ischemia, cancer, diabetes, skin and dental problems.[6]

Material and Methods

Plant Material

The seeds of *Punica granatum* was assembled from local market of Old Delhi, India in 2019 and its authentication was done by National Institute of Science Communication and Information Resources (NISCAIR), New Delhi, India having Ref. no. NISCAIR/RHMD/Consult/2019/3540-41.

Preparation of plant extracts

The seeds were firstly dried under the shed conditon for few days and then powdered into the course form. The powered seeds, using soxhlet apparatus, were successively extracted with chloroform and ethanol. After 24 hours of extraction the residues were collected and distillation was performed to separate or evaporate the solvent to give the required fractions. The fraction was suspended for concentrated dryness to obtain solid residues.

Preliminary phytochemical evaluation[7]

Both the chloroform and ethanolic extracts of *Punica granatum* seeds was conducted for detection of phytochemical constituents present in it. The screening of phytochemical properties was performed by using these methods as described below.

Detection of alkaloid

- **Mayer's Test** Test sample was tested by adding few drops of Mayer's reagent (Potassium mercuric iodide) and a yellow creamy precipitate formation shows the alkaloids test positive.
- **Hager's Test** Test sample was added with Hager's reagent (few drops)and a yellow precipitate indicates alkaloids presence.

Detection of carbohydrate

- **Molisch's Test** Few drops of reagent was added to the extracts and then few drops concentrated H_2SO_4 was poured by the side of the test tube. When a reddish violet ring appears at the junction of the two liquids, it indicates the positive sign for carbohydrates.
- **Fehling's Test** Fehling solution A and B was added equally to the sample extract then heated till yellow or brownish red cuprous oxide precipitate was formed for carbohydrate indication.

Detection of saponins

- **Foam Test** The extract was mixed with normal water (2-3ml) and shaken until the froth or foam formation. If the froth would last in 10-15 minutes, saponins was detected in the sample.

Detection of flavonoids

- **Ferric Chloride Test** Add ferric chloride (few drops) to the sample extract and flavonoids presence was indicated by blackish red colour formation.
- **Lead Acetate Test** In the test sample add 4-5 drops of lead acetate for the formation of a yellow precipitate to indicate flavonoids in sample.

Detection of steroids and triterpenoids

- **Salkowski Test** Few drops of Chloroform was added in the test sample and then treated with concentrated

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ARTIFICIAL INTELLIGENCE-HEALTHCARE, CURRENT TRENDS ANDFUTURE

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Abstract:AI the term broadly refers to computing technologies that resemble processes associated with human intelligence, such as reasoning, learning and adaptation, sensory understanding, and interaction. There is no universally agreed definition of AI. AI address to imitate the human intellectual functions. It is bringing a standard to healthcare sector, co-powered by increasing availability of healthcare data and momentum of analytics techniques. We present the current situation of AI applications in public healthcare and discuss its future. AI can be applied to various types of healthcare data for both analytical and non-analytical areas. AI is being trialled for a range of healthcare research purposes, such as detection of disease, management of chronic conditions, delivery of health services, and drug discovery. AI include the various techniques such as machine learning methods used for structured data, modern deep learning, and the classical support vector machine and neural network, and the as well as natural language processing for unstructured data. Cancer, cardiology, and nerve system they are major disease areas where AI tools are used. This full paper presents a review on details of the AI application in early detection and diagnosis, treatment, as well as conclusion prediction and evaluation. We wind up with the correlation of AI systems, such as IBM Watson, and hurdles for real-life deployment of AI.

Key words: Artificial Intelligence, analytics techniques, healthcare- research, Prediction- prognosis evaluation, sensory understanding.

1. Introduction

Artificial intelligence (AI), a human intelligence cloning, enables machines and computer systems to perform in a remarkably intelligent manner. AI system excises in a way that helps its analytical self to unimaginably maximize its possibilities of success.[1]

AI is a modern technique useful in medical healthcare. With the help of AI, doctors could easily diagnose and treat the disease and related symptoms.[2] AI is not a substitution of physicians but a catalytic tool that assists the physician to make batter clinical decisions towards individual patients thus boosting the customary decisions. This article represents the current trends of AI and future aspects as well. Day by day AI is getting increasingly refined at doing the tasks, which are otherwise done by humans, more competently, accurately, speedily, and with competitive cost.[3] The potentiality of both robotics and AI in the public healthcare sector is truly immense, becoming an indispensable part of the healthcare ecosystem.

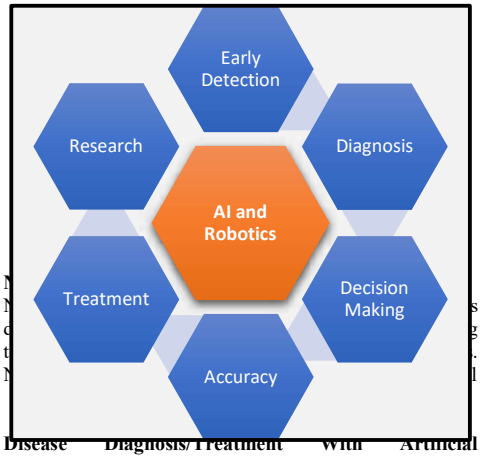

Fig. 2

Disease Diagnosis/Treatment With Artificial Intelligence

In the case of chronic diseases, AI provides an early diagnosis. Such as "Lab-on-a-chip" devices that are used to detect and monitor the infected cells of bacteria or virus an invention of AI. The following example does support the argument.[5] an application of smartphone "AiCure" that takes care of patient adherence to the medical prescriptions. This in time reminding makes sure especially for geriatric patients to take their medication on the proper time to meet the tasks ordained by their doctors. AI models can better use in treatment processes based on patient's history too.

Predicting the future with AI is no more a magic art. Several platforms provide AI software development. For exampleTensorflow, Cloud Machine Learningplayment, Ayasd, etc.

AI is used in the working of the app Ada Health Companion to operate a chat-bot, which combines the information about symptoms, obtained from the user, with additional data to offer plausible diagnoses.[6]

Applications Of Artifical Intelligence In Research And Healthcare

Medical investigation

One of the uses of AI is in the analysis and identification of patterns in large and complicated datasets at a faster rate and better precision than has been possible previously. It can be used in the search of the experimental literature for related studies and also to even combine varied kinds of data in the field of new drug discovery.

Clinical application

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NANOROBOTICS: APPROACHES, APPLICATIONS AND FUTURE PROSPECTS

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Abstract
Nanotechnology has major impact in many fields like medicine and electronics. Nanorobotics is an emerging field dealing with minute things at molecular level. They can perform a particular function with precision at nano-scale dimension. Nanorobots in medical and pharmaceutical field would particularly use in the treatment of diseases such as Alzheimer's and Cancer. Nanorobots play a significant role in the field of biomedicine.Nanorobotic technology is also used in the elimination of faulty part in our DNA structure. These nanorobots can also be used as targeted drug delivery system as they are able to carry and deliver drugs into defective cells.Nanorobot is a magnificent tool for future medicine. Various approaches, concepts of design of nanorobot are proposed which shows rapid progression in this field. The aim of this review is to providebrief information about the nanorobotic technology with special focus on prospective applications in terms of pharmaceutical and medical field and the future prospects of this technology.

Keywords: Nanorobots, Nan robotics, Nanotechnology, Biomedical.

Introduction

Nanorobotics is a science that deals with designing and developing nano-size bio responsive system which are able to diagnose and deliver the drug to the targeted size [1]. The components of nanorobots consist of motors, power supplies, onboard sensors, manipulators and molecular computers. Nanorobots could carry and deliver drug to the target site. These Nanorobots will be capable of repairing tissues, cleaning blood vessel and airway and even likely to counteract the aging process. Nanotechnology consists of characterization, production and utilization of nanoparticles in medical field [2]. As the biomedical technologies require innovative systems to replace the typical procedures, the requirement for selective drug delivery system is increasing day by day. We can replace the traditional methodologies and instruments by designing a nano-scale delivery system. Nanorobots are the feasible solution to this and can overcome some other medical challenges. Nanorobots will have the ability of actuation, sensing, signaling, information, processing, intelligence, manipulation and surge behavior at nano-scale [3].

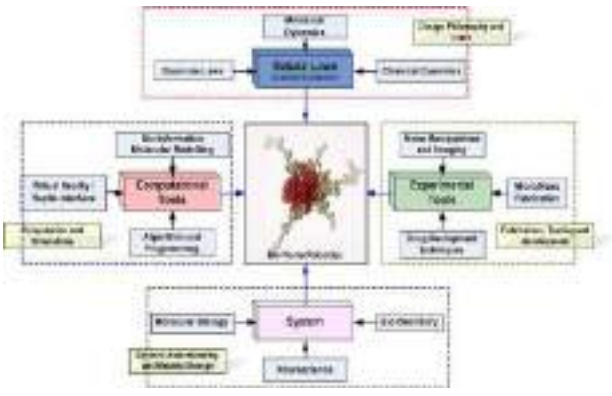

Fig.1: Nano robotics: Amultidisciplinary area [3].

Nanorobot is the minute structure that can easily transverse the human body. The scientific studies conclude that the exterior of the nanorobotsismade from carbon atoms in a diamonded structure because of its inert properties. Glucose and oxygen might be a source of impelling force and nanorobot will have other molecular components depending on its particular function [4]. Very large number of Nanorobots are required to work together to perform miniscule function as they would be microscopic in size. These Nanorobots swarms both those which are not able to replicate and which are capable of unconstrained replication in the natural environment are found in many science fiction tale such as the Borg, Nanoprobes in Star Trek [5].

Different approaches of nanorobot

Biochip

Biochip are applicable for fabrication of Nanorobots for healthcare application such as for surgical instrumentation, diagnosis and drug delivery. Currently Biochip is used for manufacturing by electronic industries. Nanorobot with biochip can be merged in nano-electronic devices which will make it capable of teleoperation and allow advanced capabilities for medical instrumentation [6,7].

Bacteria Based

This approach utilizes biological microorganism such as Escherichia Coli bacteria. This model uses flagellum as driving force for propulsion. In this biological integrated device, electromagnetic is also applied to control the motion [6,8].

Positional Nano Assembly

Robert Freitas and Ralph Merkle in 2000 were developing the agenda specially for developing positional-controlled diamond mechanic synthesis that would be able to fabricate diamonded medical nanorobots.

Nubots

Nubots is an abbreviation for "Nucleic acid Robot". Nubots are the molecular tools at nano-scale. Biological circuits gates based on the DNA material have been fabricated as molecular machines to allow in-vitro delivery of drugs for selective health problem [9].

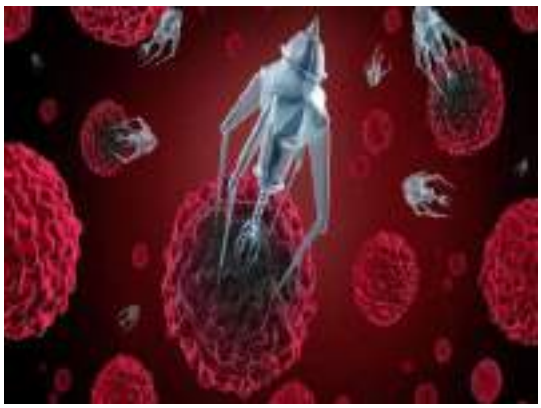

Fig.2: Nano robot treating cancerous cell [10].

Mechanism of nanorobots

Nanorobots with implanted nano-bio sensors and actuators is considered to be the latest prospects for providing the advanced medical devices to doctor. Controls are sought to effectively

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ASSESSMENT OF ANTI-INFLAMMATORY AND ANTI-ARTHRITIC POTENTIAL OF *JUSTICIA GENDARUSSA* LEAF AND STEM IN FCA INDUCED ARTHRITIS IN WISTAR RATS

Ashish[*1], Praveen K. Dixit[2], Anjali[3]

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Abstract

Justicia gendarussa Burm f. (family Acanthaceae) is also known as willow-leaves in English and commonly also known as Nili-Nirgundi, it is native to china and also very commonly found throughout the vastly part of India and Andaman islands. It is traditionally used to treat various diseases such as wound healing, anti-inflammatory, anti-oxidant, anti-proliferative, anti-arthritic etc.

The basic focus of this study is to find-out the anti-inflammatory potential of ethanolic and chloroform extract of leaf and stem part of *Justicia gendarussa* by using protein denaturation method and (HRBC) human red blood cell membrane stabilization method.

Keywords: Anti-inflammatory, *Justicia gendarussa*, Acanthaceae, HRBC, Protein denaturation

Introduction

Inflammation is a defense mechanism of host response to the external inflammatory reactions that leads to the increase synthesis and release of the various inflammatory mediators, they play the crucial role in the restoration of the cellular structure and their function.[1]

Inflammation is a protective reactions of the human immune system against various sort of detrimental stimuli like as pathogens, damaged cells, toxins (Biological and Chemical toxins) or irradiation and acts by to inhibiting the pathway of these inflammatory responses.[1]

However the prolonged inflammation increase the chances of the severe cellular injury and play a very crucial part in the pathogenesis of the various inflammatory diseases.[1]

The beginning of inflammatory responses when the activation of the leukocytes occurs in inflamed tissues. An enzyme Phospholipase A2 (PLA2) breaks the membrane phospholipids and liberates the membrane bound archidonic acid (AA) and lipoxygenase (LOX) to synthesize the various sort of inflammatory mediators.[2]

At the level of tissue the sign and symptoms is redness, swelling, heat, pain and loss of function, while on the circulatory events they occur in the process of inflammatory events include increase vascular permeability, migration and accumulation of leukocytes and synthesis and release of various sort of inflammatory mediators.[3]

Activation of Inflammatory Pathway

The pathway of the inflammation involves in the pathogenesis of a number of acute or chronic inflammatory diseases and they also share the common inflammatory pathway in various sort of inflammatory diseases.

Activation of the intracellular inflammatory signaling pathway activates the production or synthesis of the various kind of inflammatory mediators. The main foremost inflammatory stimuli, which include biological products and cytokines such as interleukin-1β (IL-1β), interleukin-6 (IL-6), and tumor necrosis factor-α (TNF-α), mediate inflammation through interaction with the TLRs (Toll like receptors), IL-1 receptor (IL-1R), IL-6 receptor (IL-6R), and the TNF receptor (TNFR). Stimulation of inflammatory receptors play the major role in the activation of various signaling pathways inside the inflammatory cells, including the mitogen-activated protein kinase (MAPK), nuclear factor kappa-B (NF-κB), and Janus kinase (JAK)-signal transducer and activator of transcription (STAT) pathways.[3]

In the response against the extracellular stimuli, like bacterial lipopolysaccharide (LPS), is stimulated and promote the inflammatory genes transcription factor like NF-κB. Activation of subsequent pathway promote the transcription of a number of genes involved in inflammation, such as cyclooxygenase-2 (COX- 2), inducible nitric oxide synthase (iNOS), and specific cytokines. The inducible iNOS promotes the synthesis and releasement of a colossal quantity of nitric oxide, which they play a vital role in pathophysiology of the disease. The induction of the COX-2 is depend on various kind of stimuli and mainly responsible in the synthesis of larger amount of the pro-inflammatory prostaglandins on the place of inflammatory reaction. The other pathway involve pro-inflammatory mediators like leukotrienes (LTs) which is synthesized by the action of membrane arachidonic acid through the involvement of the 5-LOX pathway are involved in a different sort of homeostatic biological reactions and different kind of allergic responses.[3]

There are some plants having analgesic and anti-inflammatory activities now become popular for the modern medicine system. So many plants which belongs to the family of the acanthaceae having the wide range of pharmacological and biological activity.[4]

Complementary and alternative medicine (CAM) is therapy of the disease by using the natural product they implicate the various sort of approaches like as herbal medicines. CAM steer relevant novel knowledge of the natural product therapy by the ethnopharmacologists and also helps to the person involves researchers and prove their clinical efficacy. In this category one important plant having the crucial medicinal value is *Justicia gendarussa* Burm f., belonging to the family Acanthaceae.[5]

Material and methods

Plant Materials

The aerial part (leaf and stem) of *Justicia gendarussa* (F. Acanthaceae) were procured from Delhi, India and the plant authenticated by National Institute of Science Communication and Information Resources Delhi (Ref No- NISCAIR/Consult/2019/3539-40).

After procurement, the leaf and stem were shade dried and grounded into a course powder and kept into container for use in the study.

Preparation of Extract

Aerial part of plant (leaf and stem) was extracted by using the solvent ethanol and chloroform through the soxhlet apparatus. Extract (JGLC, JGLE and JGSE) was filtered and evaporate to dryness and to get the dry extract. The extract was kept in vacuum desiccators until use. These extracts were screened for the presence of phytoconstituents like steroids, triterpenoids, alkaloids, saponins, phenolics, flavanoids, etc.

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TELEPHARMACY: A NEW CONCEPT FOR PHARMACY PROFESSION

Ayasha Saiffi[1*], Priyanka Bansal[1], Bhuwanendra Singh[2], Shekhar P. Kushwaha[1], Gaurav Kumar[1]
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Abstract
The word "tele" is a term of Greek language "Telos" which is used for "at a distance", so Telepharmacy is a distribution of medication and providing pharmaceutical care using telecommunications to patient at a distance by a registered pharmacist. In telepharmacy profile pharmacist play a crucial role in the supply of pharma services. Pharma professional can minimize the adverse drug event by reviewing the medication orders. This concept is rapidly growing field, which has a very good focused impact on healthcare delivery in many areas. Backwoods area and communities, generally lack of easy access to Pharmaceutical care services due to some geographical and demographical factors, thus it is a rapidly increasing area in rural zone which include communication between pharmacist and patient. The objective of this review is to find out how telepharmacy is recently being practiced within rural zone and community, its usefulness, and how it is being control. on the other hand, it can minimize travel time and other extra expense, which are major obstacle for elderly and disabled veterans of rural community. Now a day, it is still a new approach, and there is a slow implementation of new laws to regulate this field, although professional and technical innovations are being used.

Keywords: Pharmacist, Pharmaceutical care, Patient counseling, Rural area and Telepharmacy.

Introduction: Telepharmacy is providing the pharmaceutical services to the patient by means of telecommunication in such a way when there is no direct contact of patient with pharmacist. In telepharmacy patient counseling is done through videoconferecing [1]. "Telepharmacy is a novel approach which can be used when pharmacist is physically absent to supply the quality of pharmaceutical care which is needed."
- Allie Woods, ASHP. Telepharmacy is still a new concept, and there is a lack of laws, although pharama professionals are being involved. The zones which include telepharmacy services, there is a deficit of symmetry in rules and regulation among various legal judgements. Accomplishment and effectuation of complete and systemic telepharmacy rules are still a challenge. The success of this services depends on an efficient internet connection [2].

Kinds of Telepharmacy:

Indoor patient (remote order-entry review): This type of pharmacy are related to inpatient pharmacy which runs under the supervision of professional pharmacist at a remote location of a hospital performing remote order-entry services.

Remote dispensing (retail/outpatient/discharge): A Retail telepharmacy, is a certified pharmacy staffed by a professional pharmacy technician . A qualified pharmacist controls the technician and reviews prescriptions. Remote dispensing telepharmacy is just like a traditional pharmacy, except the professionalist is located on off-site.

Intra Venous admixture: The JCAHO describe Intra Venous admixture as, "the formulation of pharmaceutical related brand which essentially requires the calculated addition of a medicament to a 50 mL or larger bag or bottle of i.v fluid."

Remote counseling: Remote-patient counseling balances to pharma professional in providing patient guidance via a live-and-interactive video conferencing [3].

There is a very less chances in telepharmacies error rate just about ≤ 1%, approximately 50% positive change over traditional method. – United State Health and Human Services department. In rural areas there is a need of qualified pharmacist because of severe pharmacist storage. In rural zone, some communities do not possess a pharmacist, medicine center or pharmacy. Telepharmacy concept helps in availabling resources to supply pharmaceutical care, product and services to rural patients and remote zone of their states [4]. Pharmacists have extensive knowledge and skills that certify them to helps in reduction in the risk of medication related errors and Adverse Drug Events and to balanced medication-related outcomes in hospitalized patients [5].

Recent Telepharmacy Programs:

Pharmacist-Conducted clinics**:** Pharmacists, employed under collective practice agreements with doctor and using technology and the net, give patient care by checking lab test results, adjusting and providing medications, and controlling chronic diseases.

In house limited drug distribution organisation: Before doctor can write prescriptions for some medicines (such as, dofetilide and alpha one- proteinase inhibitor), professionals must ensure the clearly defined criteria have been encountered (i.e, lab tests are strickly performed or other precautionary ways performed). Some sofisticated pharmacy organizations show lab test record and other important patient related info at the same time of prescription refill. Computer and other personal digital assistant are utilized during home visits. Pharma professionals and nurses can become more effective when they use technology such as lappy, hand-held computers, tablets and—ultimately—wearable computers when they reach patient homes. documentation is streamlined, paperwork is uniform, and technical programs (including CDROMs) are available. High effectiveness means that much more patients can be seen. Patient information is downloaded routinely in every evening and shared with other staff members. A link system is developed between the patient and the care team staff members that permits larger number of direct interactions and Supportive knowledge-based relationships. Call centers services and the net are being used to create supportive educational-based relationships between patients and healthcare professionals. The aim is to develop closer direct interactions between healthcare professionals and patients or consumers by providing suitable choice and well defined access through branded programs and services [6].

Telepharmacy is a recent developing concept which appears to be using technology that showed a unique and innovative way to deliver quality pharmacy related services to rural and regional field [7]. on the other hand it minimize travel time and other expense, which are major obstacle for elderly and disabled veterans of rural area[8]. A number of hospitals, medical store, clinics, and medical centers in rural area are currently facing the shortage of local pharmacy services where medications are provided without the involvement of a pharmacist[9, 10]

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FORECAST IN PHARMACEUTICAL INDUSTRY USING ARTIFICIAL INTELLIGENCE, CURRENT AND FUTURE ASPECTS

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Abstract: "Forecasting" The term broadly refers to the process of prediction as per the customer's demand based on the huge historical sales data in the pharmaceutics industry. The aim of forecasting help to understand the market value and enable to predict the optimum level of customer demands. There by business management facilitate to augment the future requirements from the previous sales quantity documents by considering both major and minor factors in broad spectrum. This full length Paper discuss the details of marketing, new product launch and specialized aspects such as orphans and bio-similar drugs. Artificial intelligence(AI) plays a strategic role to forecast the probable market requirements in advance for the industry and prepares to face future challenges. Forecasting could be multi directional, application based on various approaches of pharmaceutical industry such as Artificial neural network topology (ANN), Adaptive Network Based Fuzzy Inference System (ANFIS) which can be applied as a neuro fuzzy approach and proposed model approaches. This paper presents a detailed account on the key role of AI pertaining to the techniques that help pharmaceutical industry supported by applications, illustrates, effectiveness and approach.

Key words: Artificial intelligence, Artificial neural network topology, business management, forecasting techniques, pharmaceutical industry.

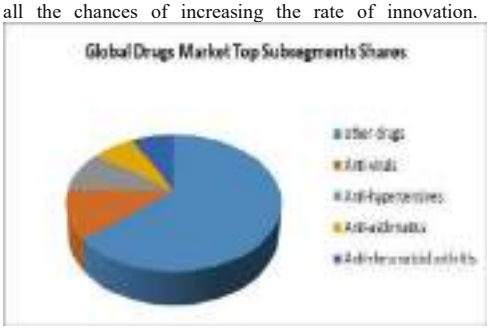
Introduction

"Forecasting" is the process of using the pattern contained in huge historical past sales data to predict future values. Forecasts are helpful to predict the future levels of sales, demand, inventories costs, imports, exports, and prices among others in the forms of numeric. The aim of forecasting is to guide the management to plan the requirements for marketing effort, material, personnel, production and market shares of the competitive products as well as marketing conditions are assist. Clear and well-prepared forecasts should be accurate enough to allow for better future planning and control could not be validated without the forecast. Demand forecasting is one of the main inputs when developing long-term strategic plans. It is a method of analysing the past and current historical data to determine future values. Hence, forecasting is the making of predictions about the future performance based on past and current huge data. Forecasting is necessary because in recent era, health and treatment services are facing issues. AI application in the pharmaceutical industry is beneficial for attaining strategic records.

1.1 Forecasting in the Pharmaceutical Industry

In 2018, the Business Research Company has published a blog in *Market Research.com* that examined the largest pharma market globally is for major industries like Piroxicam Glaxo, Dolonex, Felden and Piroxicam Pfizer etc. Which are huge giants in the manufacturing of drugs for long term treatments such arthritis, osteoporosis, tunnel syndrome, tendonitis etc. This division counted for 14% of the global total in 2017. Cardiovascular, oncology and anti-infective are the drugs rated as the 2nd, 3rd and 4th largest markets.

Up to 2021, the fastest-growing segment of the global pharma market will be occupied with drugs for treating metabolic diseases, thyroid related and pituitary gland. This segment would constantly grow at 9%rate and their recent growth is of 11.6% high but, the forecast would be that it will grow more to capture the 5th position of market size in future. Largest sub-segment of the global pharmaceutical industry is the anti-diabetics drugs worth over $85 billion in 2017; 2nd are the anti-viral and 3rd comes to the anti-hypertensive. Drugs for some of the less prevalent cancers drugs are the fastest growing sub segments. Because the USFDA has allowed a less rigorous regulatory procedure and lower endpoint benchmark for cancer drugs, there are all the chances of increasing the rate of innovation.



Materials and methods

2.1. Structure of the pharmaceutical industry

It is one of the main process of planning for forecasting in pharmaceuticals industry. It gives the information about which products are purchased, when, where and in what quantities. By incomplete forecasting techniques pharmaceuticals manufactures are affected. In a developed pharmaceutical market where predations are made using large data comparisons and AI, are seen on both valuable in terms of information and balanced market power about each product. In other words obtaining the forecasting techniques' by using terms & conditions, systematically sharing all available information and independently to develop demanding scenarios from political terms and conditions with greatest accuracy could be achieved by modern technology of AI.

Fig2.1. Complex structure of pharmaceutical market

All pharmaceutical companies are in a close relationship with pharmacy (wholesaler & retailer), doctors and patients. All pharmaceutical formulation should manufacture according to guidelines such as Food and Drugs Administration (FDA) and Goods Manufacturing Practices (GMP). For the new challenges of the modern economy. For new drugs development manufacturing management and supply chain cause the progressive effect on pharmaceuticals companies that help the economy growth for any country in the world.

2.2The proposed methodology

There exists an implicit and explicit assumption in direct human judgements with limited quantitative data. Two

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QUALITY BY DESIGN (QBD) AND MULTIFUNCTIONAL EXCIPENTS: A NOVEL HEAD-BRIDGE FOR THE RESEARCH &FORMULATION DEVELOPMENT

Gaurav Bhardwaj[1*], Shubham Sharma[2], Amrita Mathur[3] and Anuj Pathak[4]
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Abstract
The pharmaceutical industry demands innovation in short period of time so as to gain access to new products in market and has undergone a paradigm shift from traditional quality by testing (QbT) to the systematic quality by design (QbD) approach for attaining efficient development of drug products with enhanced quality and resource economics. Pharmaceutical formulators are demanding more performance and functionality from pharmaceutical excipients. Basically formulation development is nothing but playing with different additives of formulation. QbD and multifunctional excipients give patients a more effective and safe formulation. We play a critical role in ensuring reliability, efficacy, cost reduction, increasing production performance and helping to deliver a stable dosage type that is unaffected by process parameter variations or other ingredients. The need of the day is to improve drug formulations by reducing the investment in number of excipients. Implementing QbD and using multifunctional excipients have become a widely applicable production technique and go far beyond the pharmaceutical industry.This work approaches to give a insight to researchers that how working with multifunctional excipients and following QbD methodology beneficial, safe and effective formulation

Keywords: Quality by Design (QbD), Multifunctionality of excipients.

Introduction

The changing scenario of the pharmaceutical industry to fulfill global requirements is increasing the commercial pressure on research and development sectors to reduce duration of formulation development for increasing the launch of new pharmaceutical product into the market [1] while pharmaceutical QbD is an advanced methodical approach in formulation and development that starts with pre-defined objectives and emphasizes process and product understanding and quality control and risk management [2].

Sensibly all pharmaceutical products contain excipients, which are added for the purpose of controlling release profile, patient acceptability, improving statbility of formulation and increase rate of production [3]. Therefore, formulators are demanding more performance and functionality from pharmaceutical excipients. Basically formulation development is nothing but playing with different the additives of formulation composition [1-3].

Excipients participates an important role in the formulation development processes. They carry out an extensive range of functions to offer desired properties for the finished drug formulation. There are 13 categories of excipients for solid dosage forms and more than 1200 types of excipients. As per the International Pharmaceutical Excipients Council (IPEC) the essential excipients are binders, disintegrants, fillers, lubricants, glidants, compression aids, colors, sweeteners, preservatives, suspending /dispersing agents, film formers/coatings, flavors, and printing inks. In the similar manner QbD has facilitate the advancement and continuous development of drug product throughout the product lifecycle [4].

According to ICH Guidelines the Quality By Design is defined under the ICH guidelines as "A systematic strategy to develop a better understanding of predefined aims and emphasize on the product, manufacturing process and process control, based on sound science and quality risk managements". It also draws a relationship between pharmaceutical industrials and drug regulatory authorities to move ahead in a holistic, scientific, risk based and practical approach for pharmaceutical product development [6].

Also, these both approaches i.e. use of multifunctional excipient and following QbD strategies offer more effective, cheaper and safer finished products. They play a crucial role in achieving improved manufacturing efficiency, stability, cost effectiveness, and help to produce a robust formulation that is impervious by changes in standards [7].

The aim of this systematic review is provide a insight towards use of multifunctional excipients with following guidelines of QbD as they both are well- characterized and reliable development effort that can be established with a high degrees of assurance to regularly control to produced the data and finished product to meet out predefined criteria when operated within defined precincts [8].

Definitions

Excipients

The approved pharmaceutical ingredients that are introduced into the formulation to increase the bulk and stability are inert in nature and safe for human use. Excipients of the formulation also promote accuracy, stability and precision. They are used in the formulation for masking of the taste, enhance the flowability, improve the bulk density and control the release rate of the drug [9].

Co-processed excipient

According to the IPEC (international pharmaceutical excipients council) these are the combination of 2 or more compandial or non compandial excipients. These excipients are capable to modify the physical properties of the drug product, which is not possible with simple mixing and without chemical change [10].

Synthetic Excipients

These types of excipients are use for the prepration of tablet and solid dosage forms. With the help of these excipients we can improve binding ability, decreses the die wall friction between tablet and tablet punching press and maintains the pH also [10].

Multifunctional excipients

It is a combination of co-processed and preprocessed excipients that provides more than one functions to the formulations. For example silicified microcrystalline cellulose processed combination of colloidal silicon-di-oxide and micro crystalline cellulose [1, 9-10].

QbD

Quality by design is a systematic perception to widen a quality based and predefined objective of pharmaceutical finished product [11].

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ANTIOXIDANT EFFECT OF ALCOHOLIC AND HYDRO-ALCOHOLIC EXTRACT OF *TERMINALIA ARJUNA & SYZYGIUM CUMINI.*

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Abstract

Objective The objective of the present analysis was to evaluate the antioxidant effect of Alcoholic and Hydro-Alcoholic extract to *Terminalia arjuna & Syzygium cumini*

Results An Ash value of the drug gave the organic composition or the earthy matter and other impurities with the drug. Both *Terminalia arjuna* and *Syzygiumcumini* plants extracts showed the presence tannins, phenolics, alkaloids, amino acids & proteins, saponins and flavanoids. The maximal activity of Standard (Ascorbic acid) against DPPH is 95.94% as shown in Table 4. IC50 has found to be 1.56 µg/ml in Figure 1. The maximal activity of Alcoholic extract of *Terminalia arjuna* against DPPH is 85.96% and IC50 has found to be 20.05 µg/ml in Figure 2. The maximal activity of Hydroalcoholic extract of *Terminalia arjuna* against DPPH is 90.63% and IC50 value has found to be 55.39 µg/ml in Figure 3. The maximal activity of Alcoholic extract of *Syzygiumcumini* against DPPH is 88.86% and IC50 values has found to be 24.39 µ/ml in Figure 4. The maximal activity of Hydroalcoholic extract of *Syzygiumcumini* against DPPH is 90.37% and IC50 value has found to be 33.05 µg/ml in Figure 5 respectively.

Conclusions: From the above study it can be evaluated that the high content of phytochemicals which are known to exhibit medicinal as well as physiological activities in *Terminalia arjuna* and *Syzygiumcumini* Alcoholic and Hydro-alcoholic) can explain its antioxidant activity.

Introduction

Diabetes mellitus is a gathering of metabolic disorders which is described by high levels of glucose in the body because of imperfections in insulin resistance, insulin activity, or both [1]. Type 1 diabetes & Type 2 diabetes are the two major subgroups of DM. In Type 1 Diabetes, there is blood sugar problem which is caused by deficiency of insulin or in Type 2 Diabetes insulin resistance, Insulin inadequacy or deficiency implies there is of breakdown of their insulin producing cells so that sufficient insulin isn't being made by the pancreas [2]. It has been demonstrated that impaired antioxidant defense system and oxidative stress will be elevated in patients with diabetes mellitus. Elevated glucose levels initiates peroxidation of lipds and harm cells is due to hyperglycemia and complications of diabetes [3].

Terminalia arjuna (*T. arjuna*, -Family: Combretaceae), is a significant therapeutic plant generally utilized in restorative details for a few afflictions. It is found in abundance throughout Indo-sub-Himalayan tracts of Uttar Pradesh, Madhya Pradesh, South Bihar, Delhi and Deccan region near ponds and rivers. It is also found in forests of Sri Lanka, Burma and Mauritius. [4] *Syzygiumcumini*(Linn.) Skeels (Myrtaceae) usually known as Indian blackberry, Jamun, is a huge tree disseminated all through Upper Gangetic Fields, Bihar, Orissa, planted in West Bengal, Deccan, Konkan area, all woodland region of South India, additionally, developed in Thailand, Philippines, Madagascar and developed broadly all through Africa, Caribbean and Tropical America [5].

The importance of herbal medicines to treat Diabetes mellitus looks advantageous. Many work has been done in *T.arjuna*and *S. cumini*on DM. So, I have to focusing to analyze the efficacy of composite extract of *Terminalia arjuna* and *Syzygiumcuminicum vitro* antidiabetic activity.

Material and Methods

Plants material and Preparation of Alcoholic and Hydro alcoholic extract

The Stem bark of *Terminalia arjuna* and seeds of *Syzygiumcumini*were purchased from Delhi, India and identified by the NISCAIR – National Institute of Science Communication and Information Resources, Delhi, India. The powdered drug of *Terminalia arjuna* and *Syzygiumcumini*was extracted with Alcoholic Ethanol 90% and Ethanol 50% and Water 50% using the Soxhlet method. The extracts was filtered separately and evaporated to dryness to yield the dry extracts. The dry extracts was kept in a vacuum desiccators until use. A crude residue (15g) of *Terminalia arjuna* and *Syzygiumcumini*were obtained giving a yield of Alcoholic were 7.90% and 4.78% and Hydro alcoholic were 7.80% and 6.90% respectively.

Morphological evaluation

Color: The untreated piece of the two medications were taken exclusively and shade of the medications were inspected under daylight.

Odor and Taste: A little segment of the two medications were taken independently, gradually and more than once breathed noticeable all around over the materials and analyzed the scent.

Size and Shape: Width and length of the underlying foundations of *T. arjuna* and *S. cumini* were estimated with the assistance of scale. State of roots were affirmed by contrasting and writing.

Standardization of plants:

Determination of moisture content:

The powdered drug 10g of both *Terminalia arjuna* and *Syzygiumcumini* were taken and placed in moisture dise and dried to constant weight in oven at 100- 105°C. After drying for 30 minutes, Constant weight is reached when two consecutive weighings and cooling for 30 minutes in a desiccator, show not more than 0.01 g distinction. Finally,moisture content was estimated legitimately in rate [6] [7].

% of moisture content = Weight loss × 100 / Weight of the sample

Determination of Ash values:

Total Ash values

Weighed 3gm of powdered drug of *Terminalia arjuna* and *Syzygiumcumini* and incinerated in silica dish at a temperature no longer exceeding 450°C till free from cooled, weighed and carbon. The Total ash value of % was calculated with reference to air dried drug [6] [7].

Total ash value = Weight of ash × 100/ Weight of drug

Acid Insoluble Ash

Boiled the ash acquire for 5 minutes with 25 ml of Dil. HCl. Collected the insoluble matter in ash less filter paper. The insoluble matter was washed with hot water and ignites to a constant weight. The acid insoluble ash of % with reference to air dried drug was calculated [6] [7].

Extractive values of Bark powder:

Alcohol soluble extractive.

Weighed about 5gm of powdered drug of *Terminalia arjuna* and *Syzygiumcumini* were taken in a Stoppard conical flask. Include 100ml of alcohol and shake continually for 6hr in an electric shaker, permitted to represent eighteen hours. After the eighteen

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ANTIOXIDANT EFFECT OF ALCOHOLIC AND HYDRO-ALCOHOLIC EXTRACT OF *Tinospora Cordifolia & Juglans Regia*

[1*]Kapil Kumar, Praveen K. Dixit[1]& Harshit Takru[2]
[*]KIET School of Pharmacy, Ghaziabad

Abstract

Aims The objective of the present study was to evaluate the antioxidant effect of Alcoholic and Hydro-Alcoholic of *Tinospora cordifolia& Juglans regia*

Results The result showed that the alcoholic and hydroalcoholic extract of *Tinospora cordifolia & Juglans regia* contains physico-chemicals, toxic heavy metals, microbial contaminants within the limits as per WHO guidelines. Alcoholic and hydroalcoholic extracts showed positive result for the presence of alkaloid, carbohydrate, flavonoids, proteins and amino acids, fixed oil and fat. In the DPPH radical scavenging activity, alcoholic extract of *Tinospora cordifolia* (53.06%) and IC50 was found to be 8.583 µg/ml, hydroalcoholic extract of *Tinospora cordifolia* (66.78%) and IC50 was found to be 4.106 µg/ml, alcoholic extract of *Juglans regia* (63.53%), IC50 was found to be 6.459 µg/ml, hydroalcoholic extract of *Juglans regia* (95.82%) IC50 was found to be ~30.335 µg/ml respectively.

Conclusions Results revealed that *Tinospora cordifolia* and *Juglans regia* possess anti-oxidant property.

Introduction

DM is a metabolism infection wherein an individual has high glucose level, described by, glycosuria, hyperglycemia, hyperlipidemia and negative nitrogen balance coming about because of deformities in insulin emission, insulin activity, or both. Over time, having too much glucose in your blood cause health problems.[1] Unique cells in your pancreas increment of glucose and discharge insulin in your blood. Insulin has a variety of employments, however one of its primaries is to assist decline with blooding glucose levels. Type 1 diabetes is otherwise called insulin-subordinate diabetes. Less basic diabetes. It used to be called adolescent beginning diabetes, since it regularly starts in adolescence. It happens when your body assaults your pancreas (b-cell destroy) with antibodies. The organ is harmed and doesn't make insulin.[2] Many of the medical issues that can accompany type 1 happen on account of harm to minor veins in your eyes (called diabetic retinopathy), nerves (diabetic neuropathy), and kidneys (diabetic nephropathy).[3] Type 1 additionally have a higher danger of coronary illness and stroke. [4] DM ketoacidosis is a complication of Type 1 DM. Symptoms – Infection, Trauma, Hypotension, Coma. Type 2 DM. Type 2 DM used to be called non-insulin reliant or grown-up beginning diabetes. More common diabetes (90%). [17] This can create type 2 diabetes at any age in any event, during youth, center – matured and more established individuals. Moderate ted in beta cell. [5] Reduce sensitivity of peripheral tissue of insulin receptor. Excess hyperglycemic hormones. Gestational diabetes develops in some when they are pregnant. [6] This type diabetes goes away after the body is born. Secreted at low levels during fasting (basal insulin secretion). Pancreas insulin production in type 2 diabetes. [7] Gestational DM is a metabolic and inconvenience issue in pregnancy, come to fruition in one -14% of patients relying upon the populace portrayed and the enteria utilized for treatment. [16]

Tinospora cordifolia (*T. cordifolia*, Family: Menispermaceae), is an important plant widely used in medicinal formulations for several for example fever, diabetes Mellitus, Allergic, Antineoplastic, Leprosie, Malarial, Inflammatory, Fertility. The tree is long, deciduous plant that develops to 1 meter (3.3 feet) high and 0.5 meters (1.65 feet) wide broadly spreading climbing bush with a few extended twining branches. Stem of this plant is fairly succulent with long, filiform, beefy and moving in nature. Airborne roots emerge from the branches. The bark is velvety white to grey in shading and profoundly left sparally. [9] *Juglans regia* (*J. regia*, Family: Juglandaceae) this are effective antidiabetic, antioxidant, anti-allergic, anti-stress, Antineoplastic, Anti-inflammatory, ant obesity, antifungal, Antiproliferative, Antiviral, Anticancer, Antihemolytic this is Description kernel description 3.5–5 cm in diameter, globose or slightly ridge, not splitting, edible, with a rich flavor. [8]

Material and Methods

Plants material and Preparation of Alcoholic and Hydro alcoholic extracts

The stems of *Tinospora cordifolia* & Fruit of *Juglans regia* were purchased from Chawla & Co. Delhi, India and identified by Dr. Sunita Gargot NISCAIR – National Institute of Science Communication and Information Resources, Delhi, India with Reference No. NISCAIR/RHMD/Consult2018/3264-65-1 of *Tinospora cordifolia* and Reference No. NISCAIR/RHMD/Consult2018/3264-65-2 of *Juglans regia*. The powdered drug of *Tinospora cordifolia* dry and *Juglans regia* was extracted with C_2H_5O & (50:50) and H2O with Ethanol 100% using Soxhlet method. The extracts were filtered separately and evaporated in rotatory evaporator to dry to yield the desert extracts. The dry concentrates were kept in a vacuum desiccator until use. [10]

Morphological evaluation

Colour the untreated pieces of the two medications were taken exclusively and shade of the colours were analysed under daylight. *Odour and Taste* An exceptionally short part of the two medications were, gradually and more than once breathed noticeable all around over the materials and inspected the smell. *Size and Shape* Width and length of the foundations of *Tinospora cordifolia* and *Juglans regia* were estimated with the assistance of scale. State of stem & kernel were affirmed by contrasting and writing.

Standardization of Plants

Determination of Moisture Content

Put 1.0g of stem powder of the *Tinosporacordifolia* and 1.0g of kernel talc of the *Juglans regia*, in fix weighted in disc for estimate of moisture content, its withered at 105 c for five hr in warm oven after 5 hours out of hot oven, reduced the temperature in a desiccator for 30 minutes and weighted of without time waste after that repeat the procedure moisture disc when come the same weight of moisture disc after that the moisture talc was calculate of in mg/gram of air- dry sample. [13], [14]

Determination of Extractive Values

5g crumb of TC and *Juglans regia* have been seized and individually macerated with 100ml of dissolvable (for example ethanol, Methanol, water, chloroform, ethyl acetic acid derivatives and oil ether) in a shut cup for 24 hours, shaking habitually for the initial 6 hrs and permitted to look for 18 hrs, at that point separated with playing it safe against loss of dissolvable. Ultimately dried at a hundred and five and weighed. The % of the alcohol soluble, water soluble, had been calculated with regards to air dried crumb of TC and *Juglans regia*. [13], [14]

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DEVELOPMENT AND METHOD VALIDATION OF ORLISTAT BY UV-VISIBLE SPECTROPHOTOMETRIC METHOD FOR ITS QUANTITATIVE DETERMINATION IN BULK DRUG AND PHARMACEUTICAL FORMULATIONS

Kiran Sharma[1], Jagannath Sahoo[1], Alka Verma[1]
[1]KIET School of Pharmacy, KIET Group of Institutions, Delhi-NCR, Ghaziabad affiliated to Dr A.P.J. Abdul Kalam Technical University, Lucknow, Uttar Pradesh

Abstract
A simple, fast, selective, accurate and specific UV-Visible spectrophotometric technique was developed for the estimation of Orlistat in bulk drug and capsule dosage formulations. The drug detection was carried out by using UV-Visible spectrophotometer at λ max of 217.5 nm using methanol as solvent and the procedure employed extraction steps for the drug from the formulations. The method was validated for specificity, linearity, accuracy, precision, limit of detection (LOD), limit of quantification (LOQ), robustness and ruggedness according to the present ICH guidelines. The calibration graph was linear in the concentration range of 1 to 10 µg/ml with the correlation coefficient of 0.9993. The accuracy was found to be in between 99.3 and 100.9 %. The precision amongst six samples preparations was 0.42% with LOD and LO Q values 0.07 and 0.238 µg/ml, correspondingly. The percentage recovery of the drug was found to be 100.2% which indicates that there was no interference of the capsule excipients with the method and it can be suitably employed for regular estimation of Orlistat in bulk drug, marketed formulations and other dosage forms.
Key words: Orlistat, UV-Visible Spectrophotometer, ICH guidelines, validation

1. Introduction

Obesity is very common problem with young generation, as well as old people due to lifestyle changes and junk food. To treat this problem now a day's people uses a drug known as Orlistat. Orlistat usually acts by blocking the lipase thus reducing the aborption of fat that you eat or keeping it from being absorbed by our body. This medicine reduced the total calorie intake from the diet. It is mainly used with consultation from a health provider to reduce body fat. Xenical and Alli are some marketed drugs available for the orlistat as OTC drug in some of the countries.

Orlistat is a saturated derivative of lipstatin as shown in figure 1, which a storng innate inhibitor for pancreatic lipases which was obtained from the bacterium Streptomyces toxytricini. It was chosen over lipstatin for obesity treatment due to its quality and safety [1].

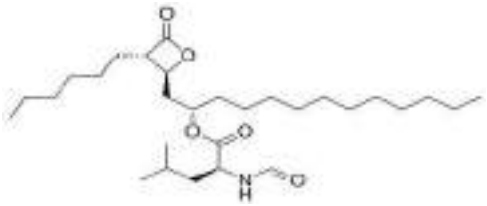

Figure 1: Structural formula for Orlistat

Orlistat acts by blocking the gastric and pancreatic lipase, these are the enzymes which break down the fat present in the intestine into triglycerides. When the function of these enzymes are blocked, then triglycerides from the diet are not able to get hydrolyzed into free fatty acids and thus get excreted from the body without being absorbed through feces [2].

Thioesterase domain of fatty acids synthase (FAS) was recently found to be block by the Orlistat drug. These enzymes were found to help in proliferation on cancer cells but do not affect the normal cells of the one body [3]. The probable adverse effects of orlistat are like blocking of the cellular off-targets or low bioavailability. One study depicted chemical proteomics approach to look for new cellular targets of Orlistat including drug other targets [4].

Orlistat was normally taken as the dose of strength 120 mg three times in a day previous to the meals as per the standard prescription of the drug. It also reduces approximately around 30% of intake dietary fat from being absorbed by the body [5].

Various analytical methods have been reported using HPLC, LC-MS, UPLC and other techniques for analysis of Orlistat in plasma and urine. So many formulations are available in market as single drug and in combination with other drugs, which calls for the requirement for a method which is simple, easy, fast, responsive, accurate, specific and reliable method for the determination of Orlistat in pharmaceutical formulations as well as in bulk drug. The main objective of the current work is to prepare a method for the routine analysis of Orlistat by UV-Visible spectrophotometer. The proposed method decreases the analysis time for the drug while avoiding any interference from the excipients or other ingredients of the formulation [6].

2. Materials and Methods

2.1. Materials

Orlistat was obtained as a gift sample from CMG Biotech Pvt. Ltd, India. Methanol AR Grade used was of Merk Chemicals, India. Marketed formulations (A, B & C) are purchased from the local market with drug equivalent to 60, 120 & 120 mg of orlistat. All the supplementary chemicals and reagents used in the study were of high quality grade.

2.2. Method development

2.2.1. Instrumentation

Double beam UV-Visible spectrophotometer model (Kyoto, Japan) 1601 with 10mm cell length and quartz cells were used for the analytical purpose and method development.

2.2.2. Standard stock solution

The Orlistat stock solution with concentration of 10µg/ml were prepared in methanol. The various dilutions were prepared from the stock solution by diluting 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 ml upto 10ml with methanol to get the different dilutions of the drug from 1 to 10 µg/ml.

2.3. Method optimization

2.3.1. Selection and Optimization of Solvent

Solvents have a very profound effect on the quality and the sharpness of the peak. Various solvents like methanol, chloroform, acetine, water were used to get the best peak in a particular solvent. All solvents were optimized and out of them methanol was found to give satisfactory results relating to quality and shape of the peak. Methanol also showed no

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FORCED DEGRADATION STUDIES FOR DRUG PRODUCTS AND DRUG SUBSTANCES: SCIENTIFIC AND REGULATORY DELIBERATIONS

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Abstract

Forced degradation experiments are important tool to evaluate the stability of a drug substance and understand its impending impact on a drug's purity and potency as well as on patient safety. Forced degradation is degradation of new drug product and drug substance at conditions more harsh than accelerated conditions. It is required to exhibit specificity of stability indicating methods and it also provides an insight into degradation pathways and degradation products of the drug substance and helps in elucidation of the structure of the degradation products. The U.S. Food and Drugs Administration (FDA) and International Council for Harmonization (ICH) guidelines affirm the requirement of stability testing data to understand how the quality of a drug substance and drug product changes with time under the influence of various environmental factors and demonstrate certain degradation conditions like oxidation, light, dry heat, hydrolysis, basic, acidic, hydrolysis etc. ICH Q1A, QIB and Q2B exemplify the forced degradation studies. The degradation products appearing during manufacturing and stability studies are required to be reported in the dossier submitted for product registration (ICH Q3B(R), 2003). Hence, the ICH guideline Q1A(R2) (2003) require forced degradation study on drug substances to provide data on decomposition products, which can be used to establish degradation pathways, intrinsic stability of the molecule and validation of SIAM (Q1A (R2), 2003).

Keywords: ICH, preformulation studies, forced degradation, stability.

Introduction:

The ICH guideline Q1A on Stability Testing of new Drug Substances and Products gives indications for the testing of factors which may be liable to change during long storage and are likely to affect quality, safety and efficacy. It must be done by validated stability indicating testing methods. It is mentioned that forced degradation studies [1] or stress testing at extremes pH, temperatures in 10 °C increments above the accelerated temperatures and under oxidative and photolytic conditions have to be carried out on the drug substance so to set up the stability characteristics and degradation pathways to back up the appropriateness of the proposed analytical procedures.

Objectives of forced degradation (FD) studies [2,3]:

These studies are carried out to achieve the following purposes:

i) To ascertain the degradation pathways of drug products and drug substances.
ii) How each one of these factors has the capability to accelerate, catalyze or mediate one or more of the various degradation reactions like oxidation, hydrolysis, photolysis (photolysis) or some other unwanted conversion of the drug product or drug substance and understanding the degradation mechanism.
iii) To find out the intrinsic stability of a drug substance in formulation.
iv) Development of stability indicating assay of method already developed. Establish shelf life of drug products or establish a re-test period for the drug substance and recommended storage conditions.
v) To provide information on drug substance or product characteristics. Identification of potential degradants.
vi) To generate more stable formulations.
vii) To differentiate degradation products that are related to drug products from those that are generated from non-drug product in a formulation.
viii) To explain the structure of degradation products.
ix) Process development, design and optimization of manufacturing process.
x) To understand the chemical properties of drug molecule.
xi) Formulation design.
xii) To generate a degradation profile similar to that of what would be observed in a formal stability study under ICH conditions.
xiii) Packaging development, and
xiv) To solve the stability related problems.
xv) Stability studies are used to provide data to support registration submission, clinical trials, or commercialization.

Regulatory guidelines

Various International guidelines recommended FD studies ICH guidelines sometimes apply only to the marketing applications for new products and do not cover the part during clinical development. The ICH guidelines that are applicable to forced degradation studies are [4,5]:

a. ICH Q1A: Stability Testing of New Drug Substances and Products,

b. ICH Q1B: Photo stability Testing of New Drug Substances and Products,

c. ICH Q2B: Validation of Analytical Procedures: Methodology.

ICH Q1A (Stress testing): Recommended conditions for conducting FD studies on drug products and drug substances. The recommendations are to check the results of temperature (above that for accelerated testing, i.e., >50°C), oxidation, humidity (75% relative humidity), and photolysis. Wide pH range should be taken into account in the testing of suspension or solution.

ICH Q1B: Recommended approaches to evaluating the photo stability of drug products or drug substances. For drug substance and drug product FD conditions are specified in Section II and Section III respectively. FD studies exposure levels are not defined. Photo stability testing can be performed in solid or in suspension/solution. These samples are then used to develop a stability indicating method. Some of the degradation products formed during FD studies may not really be empirical to form during stability studies in which case they need not be examined further [6].

ICH Q2B: Gives guidance to validate the analytical methodology. To prove specificity, in section B 1.2.2

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COST ANALYSIS OF PHARMACOTHERAPY IN DIFFERENT INTENSIVE CARE UNIT

Mandeep Kumar Arora[1], Roopa Rani[1], Ashok Jangra[1], Jagannath Sahoo[1]
[1]KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad

Abstract

The present study was conducted with the aim to study pattern of morbidity, cost of pharmacotherapy and the outcome in patients in medical, surgical and respiratory intensive care units of a tertiary care centre in the setting of a peripheral medical college in western UP. The data of patients from completed case record files was obtained from case record section of and retrospectively analysed. Maximum patients were from rural area (86%) and predominance of male (56%) patients were observed. Observed morbidity pattern in MICU includes cardiovascular and cerebrovascular events, trauma, metabolic events, liver diseases, gastrointestinal disorders, haematological and renal complications, poisonings, infections, and acute abdominal conditions, and pneumonias, obstructive and restrictive respiratory conditions. Mean duration of stay was 6.36 days and ranged from 1-35 days with survival rate 80%. Treatment cost in medical, surgical and respiratory intensive care units was Rs.7062.5, Rs. 6529.43 and Rs. 8901.17 respectively and overall mean cost was Rs.7264. Daily cost of treatment was 1750 in MICU, Rs.1424 in SICU and Rs.2342.94 in RICU. Overall cost of drug treatment per day was Rs.1825.40 Cost of medicine was less in surgical cases. Overall 326 different types of drugs were prescribed, of these 84% were by brand names and 16 % by generic names. 45% were given as injectable and 55% by oral or other dosage forms. Antimicrobials were used in all the (100%) patients, monotherapy with antimicrobials was used only in 15% cases, two AMA were used in 56%, three in 26% and more than 3 in 3% cases. Taken together, branded antimicrobials were the major contributors for the overall cost of pharmacotherapy. Government initiative for the production and supply of antibiotics in major hospitals by generic name along with rationale use of antibiotics may reduce the overall cost of pharmacotherapy.

Keywords- ICU; Pharmacoeconomics;

Introduction

The Intensive Care Unit (ICU), an integral part of the health care system. Although most ICUs are found in high-income countries, they are increasingly a feature of health care systems in low- and middle-income countries. Basic care in ICU is generally perceived as costly and expanding [1]. It remains a test to precisely survey the cost of serious care because of absence of institutionalized philosophy. There is likewise significant heterogeneity amongst Nations and even inside the Nation in assignment of assets, dissemination of basic care administrations and cost of work force and cost of medications [2]. The unbreakable quality and immaterialness of a few human services results is likewise a worry, especially while assessing cost viability. Each intensivist ought to effectively include in understanding the expenses in their individual unit and how it identifies with remedial movement, case blend and clinical result. So as to enhance examination of costing information from various ICU, a working gathering distinguished six 'cost squares' i.e. expenses of staff, clinical help administrations, consumables, homes, non-clinical help administrations and capital gear [3]. There are just not many examinations investigating expense of concentrated care in India. It is assessed that there are around 70,000 ICU beds accessible including numerous types and over all clinics and little time nursing homes in India that oblige five million patients requiring ICU confirmation consistently [4]. Tragically, the normal man sees that marvels consistently occur in ICU and does not have a sensible desire for basic care result. Consequently, quiet moderateness to get to basic care administrations turns into an essential factor and from a specialist Organization's point, installments may turn into an issue.

Pharmacoeconomics can be characterized as the branch of financial matters that utilizations money saving advantage, cost-viability, cost-minimization, cost-of-disease and cost-utility examinations to look at pharmaceutical items and treatment systems [5]. Learning of pharmacoeconomics is along these lines essential for clinical pharmacologists who are associated with advancing objective recommending [6] or in clinical preliminaries which fuse a financial segment. The significance of pharmacoeconomic data to medicinal services chiefly rely on the perspective from which the investigation is directed. In the course of the most recent decade there has been enormous enthusiasm for financial assessments of social insurance programs, particularly in the pharmaceutical field. It's worthwhile to note that, a few governments run ICUs where expenses of care may surpass accessible subsidizing, are noted to have restricted assets, absence of foundation, prepared intensivists and care staff. Thereby, interest for cost of medicinal services are expanding in all Nations. With a specific end goal to comprehend the cost, it is imperative to understand the present association of basic care benefits in India, present study was designed to evaluate the cost of ICUs in Private hospital.

MATERIAL AND METHOD

- Setting of the study:
  - ✓ The study was conducted in Chhatrapati Shivaji Subharti Hospital, Meerut
- The completed files of patients after discharge were procured from record section of hospital in a random order.
- The record of 100 medicals, surgical and respiratory intensive care unit patients were obtained.
- The confidentiality of patient's identity was maintained.
- Data was recorded-
  - ✓ Patient initial
  - ✓ Age
  - ✓ Sex
  - ✓ Rural /Urban
  - ✓ Morbidity /disease
  - ✓ Drugs prescribe with:
  - ✓ Formulation
  - ✓ Dose
  - ✓ Frequency
  - ✓ Duration of treatment
  - ✓ Patients outcome
  - ✓ Duration of stay in hospital

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THIAZOLO[2, 3-B]QUINAZOLINES DERIVATIVES AND HYBRIDS: A NOVEL EMERGENT ANTITUMOR AGENT

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Abstract

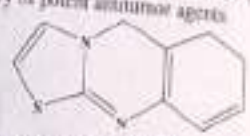
This review is focused on recent summative overview of thiazolo[2,3-b]quinazoline derivatives and its hybrids as a novel antitumor agent. Thiazolo[2,3-b]quinazoline is a class of fused nitrogenous heterocycles that are of substantial curiosity due to assorted range of their pharmacological potential. Among a wide diversity of nitrogen heterocycles, thiazolo[2,3-b]quinazoline have been explored for developing pharmaceutically imperative molecules. Countless derivatives of quinazoline are used in the pharmaceutical, medicine and agriculture due to their diverse range of biological activities like anti-inflammatory, antimicrobial, diuretic, antiallergic, anticonvulsant, antihypertensive and antiparkinsonian. As per present scenario it has been observed that most of the thiazolo[2,3-b]quinazoline imparted antitumorigenic action. They exhibit action comparable to antimetabolites from the group of folic acid analogues of chemotherapeutics. This opinion survey assemble literature work done by researchers recently on thiazolo[2,3-b]quinazoline for their antitumor potential. This review also aims to confer potential future directions on the expansion of more effective and precise analogues of thiazolo[2,3-b]quinazoline for various antitumorigenic targets. Collectively, all these findings suggested that thiazolo[2,3-b]quinazoline derivatives could be potential drug candidates to treat carcinogenic conditions.

Keywords: Thiazolo[2,3-b]quinazoline derivatives and hybrid, antitumor agent

Introduction

Thiazolo[2,3-b]quinazoline is a class of fused heterocycle quinazolines derivatives well known for diverse range of activity[1]. It is interesting to note that available chemical literature represent several organic compounds containing a fused heterocyclic ring, i.e., Thiazolo[2,3-b]quinazoline (1) makes a broad class that attracted attention in the ancient few years owing to its wide range of pharmacological activities, especially anti-inflammatory, antimicrobial, diuretic, antiallergic, anticonvulsant, antihypertensive and antiparkinsonian.

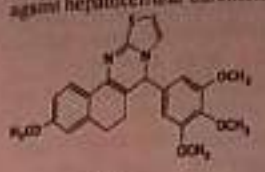
It has been found that thiazolo[2,3-b]quinazoline analogues are center of attraction from last few decades due to possess a broad spectrum therapeutic potential in variety of pathological conditions[2]. Thiazolo[2,3-b]quinazolines were establish to own a significant antitumor activity[3]. Literature survey suggested that thiazolo[2,3-b]quinazoline analogues and its complex hybrid with other fused moieties exhibits antitumor action acting as an inhibitor of antifolate thymidylate synthase and a few of these are now in clinical development[4-7]. Researches synthesized and tested a wide range of thiazolo[2,3-b]quinazoline derivatives and hybrid for their significant cytotoxic potential. It has been observed that this class of heterochemical have a significant potential to control proliferation in carcinogenic cells[8-9]. These preliminary biological screening of the diverse range of molecules offer an excellent framework in pharmaceutical field, and which may lead to discovery of potent antitumor agents.



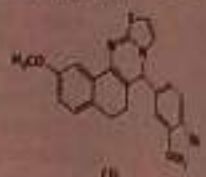
Thiazolo[2,3-*b*]quinazoline

(1)

Keshari et al (2017) synthesized a library of novel thiazolo[2,3-b]quinazoline analogues via one pot synthesis method and screen the complete range of compound using in-silico and in-vitro procedures and found a compound named 2-methoxy-4-(2-methoxy-6,7-dihydro-5H-benzo[h]thiazolo[2,3-b]quinazolin-7-yl)phenol (2) and 3-methoxy-7-(3,4,5 trimethoxyphenyl)-6,7-dihydro-5H-benzo[h]thiazolo[2,3-b]quinazoline (3) are active against hepatocellular carcinoma on albino wistar rats[10].



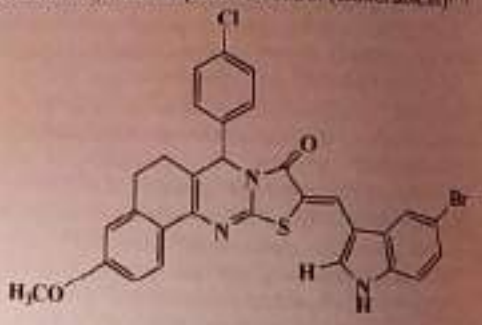
(2)



(3)

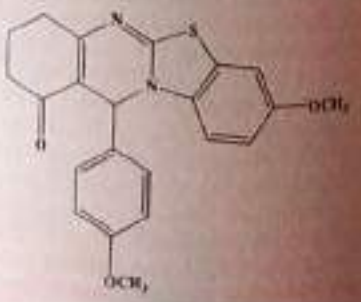
Gali et al (2015) synthesized a collection of novel derivative of thiazolo[2,3-b] quinazoline derivatives followed by Knoevenagel condensation under conventional method. All the synthesized compounds were screened and evaluated for their in vitro antitumor activities.

10-((1-bromo-1*H*-indol-3-yl)-methylene)-7-aryl-7,10-dihydro-5*H*-benzo[*h*]thiazolo[2,3-*b*] quinazolin-9(6*H*)-ones derivative (4) have exhibited excellent activity against MCF-7 (breast cancer cell line) than the positive control (Doxorubicin)[11].



(4)

Sangshetti et al (2014) synthesized benzothiazole[2,3-b]quinazolin-1-ones from aminobenzothiazoles, cyclic 1,3 diketone, and aromatic aldehydes via one pot green synthesis method. All the synthesized compounds were subjected to chemical and biological screening for their anticancer potential. 8-methoxy-12-(4-methoxyphenyl)-2,3,4,12-tetrahydro-1H-benzo[4,5]thiazolo[2,3-b]quinazolin-1-one (5) was found the most active member of this newly invented category during study[12].



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NANO-PARTICULATE CARRIER SYSTEMS IN RHEUMATOID ARTHRITIS MANAGEMENT

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[2]Department of Pharmaceutical Sciences, Indira Gandhi University, Meerpur, Rewari, Haryana, 123401, India.

Abstract
In modern practice rheumatoid arthritis is a well known autoimmune disease. The main aim of this review is to establish the evidence in favour of nanocarriers over conventional therapeutic approaches to treat the various pathologic conditions of arthritis efficiently. This review provides a complete account that why the nanocarriers are more preferable over other delivery system used in arthritis treatment for delivery of various therapeutic agents. In this review all those characteristic features are mentioned which are responsible for making the nanocarriers more efficient to deliver a therapeutic agent at desired site in various biological condition inside the body. In this review, all those aspects are discussed which are responsible for maintaining the pharmacokinetic challenges inside the body. This review is helpful to understand all the patients' complaints which mainly occur due to treatment by drugs given by conventional drug delivery system.

Key words: Rheumatoid arthritis, Nano-particulate carrier systems, nanoparticles, Gene therapy

1. Introduction

Inflammation, joint pain and degeneration mainly occurs in synovial lining but inflammation also occurs in other organs and tissues e.g. lungs, pericardium, pleura and sclera. About 1% of world population is affected by rheumatoid arthritis (RA) and women are affected three times more often than man. Onset is most frequent between the ages of 40 to 50 years, but the people of any age can be affected. It is Arthritis is a systemic, progressive and degenerative autoimmune joint disease. In arthritis well understood that there is no single cause for development of the rheumatoid arthritis in any men **[1].** The development of arthritis is showing multi interacting mechanism. Genetic components, environmental condition, hyper activity of immune system against self molecule are some causes that can develop the disease.

Actually the main cause of RA is auto reactivity of immune system against self molecule due to environmental trigger and genetic susceptibility **[2, 3].** Genetic susceptibility causes majority of RA cases (40-60%) **[4],** specific genes on chromosome-6 play role in genesis and severity of RA. HLA (Human Leukocyte Antigen) is defined as special type of cell surface protein encoded by MHC. 70% of arthritis patients (Caucasian) have HLA-DR4 class-2 antigen but Native Americans those have HLA-DR9 (3.5 times greater) Polymorphic gene causes the development of RA **[2, 5].** In addition environmental trigger like Smoking, alcohol, periodontitis, infectious agent may also cause RA **[2, 5, 6].**

2. **Infectious agent causing RA**

The microbial agents which cause infection via which RA further occurs includes P. gingivalis, parvovirus, hepatitis virus, human immunodeficiency virus (HIV), P. mirabilis, Epstein-barr virus (EBV), mycoplasma, cytomegalovirus (CMV),herpes virus, human T-lymphotropic virus 1 (HTLV-1), enterobacterium, mycobacterium, Streptococcus, pyogenes (S. pyogenes) and Salmonella. Inflammatory processes in condition of RA are induced by T-cell, B-cell and Macrophages, Plasma cell including cytokines, growth factor, and adhesion molecule and matrix metallo-protein. After presentation of antigenic peptide the T-cells become activated, initially causing pain and swelling **[2, 7]**. Separately two sets of T-cells called $CD4^{+}$-Th1 and Th2 cell release the various cytokines by which inflammatory responses are propagated. Th1-cell releases IL-2, IFN-γ, TNF-α, GMSF (Granulocyte Macrophage colony Stimulating Factor) which causes the delayed hypersensitivity seen during early onset RA and Th2-cell releases IL-4, IL-5, IL-6, IL-10 affects B-cell differentiation and activation which mediate the enhanced production of Rheumatoid factor (Anti IgG- antibody). Separately IL-1, IL-6, IL-8 and TNF-α cause bone and cartilage destruction **[2, 4, 5, 7].** RF-IgG complex is dangerous because it cannot be cleared by complement system and so this complex causes inflammation by stimulating macrophages. RF-IgG complex binds on the surface of macrophages by receptor FcR-ша (CD-16a). These receptors present only on surface of RA affected tissue macrophages.

3. Therapeutic option for RA treatment -

After understanding the pathophysiology of RA several drugs have been used widely. There are many categories as mentioned NSAID'S, immunosuppressant, glucocorticoids, biologics and last one is kinase inhibitors. Previously NSAID'S were used most widely in RA treatment for lessening the pain, but it is not used longer owing to its several limitations such as limited effectiveness, serious adverse effects, and inability to modify disease course. Hence, Immunosuppressive drug are used for RA treatment in combination with NSAID'S **[8].** Except corticosteroids all immunosuppressive drugs can be possibly used for suppressing the rheumatoid process and bring about an emission. Immunosuppressive drugs do not possess the anti-inflammatory and analgesic action. These drugs are also called as disease modifying anti rheumatic drugs (DMARD) or slow acting anti rheumatic drug (SAARD). Corticosteroids are especially employed as adjuvant to NSAID'S alone or along with DMARD'S. In modern practice, combination therapies of NSAID'S and suppressive drug have been used increasingly to suppress the disease as soon as possible or to induce remission. Corticosteroids are an effective therapeutic option for RA treatment used in combination-therapy along with NSAIDS or DMARD. Glucocorticoids are more effective than DMARD'S and biologics in early phases of RA **[9].** Biologics in RA treatment may create a revolution in treatment strategies. Biologics include mainly inhibitor or antagonist of those cytokine that are interlinked with the pathogenesis of RA. Basically these are TNF-α, IL-1β and IL-6 inhibitors or antagonist such as B-cell depleting agents and T-cell costimulator or modulators. The success ratio of biologics based therapy is generally 60-70%. TNF-alpha inhibitor-MTX combination has been investigated for improving arthritic threat **[10].**

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ROLE OF ARTIFICIAL INTELLIGENCEIN TREATMENTOF HYPERTENSION- A REVIEW

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Abstract

Nowadays Artificial Intelligence methods are becoming very popular in medical applications due to high reliability and ease. Hypertension is a principal for cardiovascular disease. Currently, around a third of people with hypertension are undiagnosed and those who are diagnosed in which around half of them are not taking antihypertensive medications. The World Health Organisation measures that high blood pressure directly or indirectly causes deaths of at least nine million people globally every year. The full article studies the capacity of variously designed & trained Artificial Neural Network to predict the possibility of occurrence of Hypertension in a mixed (healthy & hypertensive or both sexes) patients. In this review article, the introduction or survey of different artificial intelligence methods adopted by researchers for diagnosing or predicting hypertension will be explained in detail.

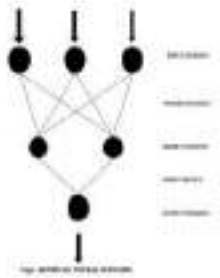
Keywords: Artificial Neural Network, Hypertension, Health Surveillance, Fuzzy system, Self-monitoring

Introduction:

Hypertension has been distinguished by WHO as one of the most vital risk factors for mortality worldwide and is responsible for the deaths of nearly nine million people annually. In the UK, the National Institute for Health and Care Excellence defines high blood pressure also known as hypertension, as a clinic blood pressure of 140/90 mmHg or higher confirmed by thefollowing ambulatory blood pressure monitoring daytime average of 135/ 85 mmHg or higher [1]. Hypertension risk increases in older age whilst its control becomes difficult with rising age. To correctly evaluate the risk of permanent hypertension in a patient, doctors analyzevarious other factors from physical examinations of the patient. These factors incorporate heart conditions, diabetes, renal conditions, etc. Researchers have been suggesting artificial intelligence techniques including Neural networks and Fuzzyto estimate hypertension risk [2]. Artificial neural networks render a sturdy tool to help doctors to analyze, model and make sense of complicated clinical data across a wide range of medical applications [3]. In the practice of medication, Artificial neural networks are now being actively applied in areas of cardiology, pulmonology, genetics and clinical chemistry [4]. This articleisdesigned within different sections as follows: The next two sections present a brief introduction to Artificial Intelligence techniques i.e. Artificial neural network and fuzzy techniques respectively.

Artificial Neural Network

Artificial Neural Networks are electronic models based on the neural arrangement of the brain. The brain learns by experience. These biologically inspirited methods of computing may be the progression in computing application. Whenever we discuss a neural network, we should alsousually say -Artificial neural network, they typically consist of hundreds of simple processing units that are wired mutually in a complicated communication network. Each unit or node is a clear model of genuineneuron which sends a new signal if it receives anadequately strong input signal from the other nodes to which it is connected [5]. Neural networks are based on invented neurons, which are joined together in a type of way to form networks. The Neural Network relates the human brain in the following two ways: I- A neural network acquires data throughout learning. II- A neural network's data is stored inside the interconnection strength known as synaptic weight. These weights describe the strength of the connection within the neurons. Each neuron has a united activation function which is performed on the input to get the output.



Fuzzy System

The methods of Artificial Intelligence have broadly used in medical applications for diagnosis and treatments such as Fuzzy expert systems, neural networks, etc. Henceforth, this study is intended to apply in the fuzzy system to diagnose hypertension disease. A human brain works with fuzzy concepts, now those computers may be artificially made fit with such concepts with the use of fuzzy systems. A fuzzy system composes of a fuzzy rule base and a Fuzzy Inference.

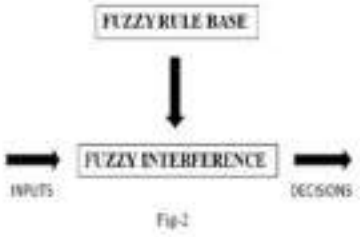


Fig-2

The fuzzy system liesin four parts is fuzzy rule base, fuzzy interference engine, Fuzzification, and defuzzification[6].

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ADOPTING *IN SILICO* DRUG DISCOVERY TECHNIQUES: NEED OF THE HOUR

Preeya Negi*, Surya Prakash, Vaishali M. Patil
KIET School of Pharmacy, KIET Group of Institutions, Delhi-NCR, Ghaziabad, India

Abstract
Over the last two decades, the computer modeling/simulation software has secured a reliable place in various research labs involved in drug discovery and development. The softwarehas found to be successful in replacing the robots and reagents during high-throughput screening to investigate potential drug or lead candidates. The advantages of *in silico* methods are unlimited and have contributed towards faster, efficient methods with overcoming budgetary restrictions specifically for academic labs. Some of the Government Agencies are taking initiatives towards set up of the labs. With the advent of artificial intelligence (AI) in health care, the understanding and adopting application of *in silico*/computational approaches is getting convenient. The manuscript describes recent developments and requirements for effective application of *in silico* tools for drug development.

Keywords
In silico methods, Drug discovery, Drug development

Introduction
Over the last two decades, the computer modeling/simulation software has secured a reliable place in various research labs involved in drug discovery and development. The software has found to be successful in replacing the robots and reagents during high-throughput screening to investigate potential drug or lead candidates. The advantages of *in silico* methods are unlimited to screen a library of thousands of compounds and predict biological activity profile of non-synthesized compounds. These can be used for predicting mechanism of action, toxicity (carcinogenicity, teratogenicity, cardio toxicity, skin sensitization, etc.), pharmacokinetic properties as well as drug-likeness index. Some of the *in silico* methods applied at various stages at drug discovery process are shown in figure 1. This has contributed towards faster, efficient methods with overcoming budgetary restrictions specifically for academic labs that cannot afford purchase or synthesize thousand of compounds for *in vivo* and/or *in vitro* screening for various disease conditions. Various academic *in silico* labs are functioning and have been acknowledged for their efforts for drug discovery. Some of the Government Agencies are taking initiatives towards set up of the labs or making available required resources such as Department of Biotechnology (India) [1], Organization for Economic Co-operation and Development (OECD) [2], European Chemicals Agency (ECHA) [3] etc.
With the advent of artificial intelligence (AI) in health care, the understanding and adopting applications of in silico computational approaches is getting convenient. The academic institutes rely on various open source platforms/software to set up in silico facilities to give early exposure to undergraduates and graduates from various disciplines like applied sciences, pharmacy, biomedical sciences and bioengineering. The four in silico methods applied for drug design, lead discovery and modification are depicted in figure 2. In silico drug discovery process can be categorized in three stages [4].

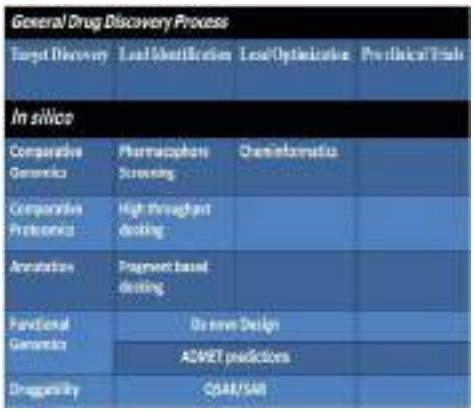

Figure 1: General drug discovery process and related *in silico* approaches

Stage 1
It involves selection of a target and preparing a heterogeneous molecule library that is to be tested against the target. This isdone through virtual screening either by molecular docking or building structures at active site by using De novo design methods.
Stage 2
The selected promising hits are then checked for their specificity by docking at binding sites of previously known drug targets.
Stage 3
Detailed *in silico* absorption, distribution, metabolism, elimination and toxicity (ADMET) studies are done for selected molecules and the molecules that pass these studies are termed as leads.

Figure 2: *In silico* methods for drug design

Some of the *in silico* tools, techniques and software are as narrated in Table 1.

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DESIGN OF EXPERIMENT APPROACH IN HPLC METHOD DEVELOPMENT AND VALIDATION

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Abstract

Design of experiment approaches is an important adjunct to the HPLC techniques as because a large number of variables can be controlled at a time to obtain the optimum conditions for the desired responses. Also they can effectively determine the most optimum conditions for desired results in limited number of trial runs. In the current work we have discussed the various chemometric techniques in HPLC for a) Dissolution studies by HPLC analytical method development in view of increasing replacement of conventional detectors with mass detectors and increasing value of stability indicating assays. b) validation using design of experiments techniques. Different types of experimental designs and their particular use in specific situations using the statistical models in design of experiments have been highlighted. The progression of design of experiments to the Quality by Design model has been described. Chemometric techniques and different methods of peak separations have been reviewed.

Key words: Design of experiment, Optimization Designs, Method Development/Validation, Mathematical Modelling.

1.0 Introduction

Chemometrics, [1] has become a well-known branch in analytical chemistry in recent years. A large number of data is generated in modern analytical technique using high performance liquid chromatography (HPLC) because of several variables used in analytical measurements. Due to its large number of variables, the process becomes crucial and needs to be properly adjusted before every single run. Hence deeper understanding of the process becomes important. Thus, the statistical analysis of the processes by means of chemometric tools have become favorable i.e. in demand because of several advantages, such as reduced number of experiments, less solvent consumption and decreased labor work. Due to a large number of variables (mobile phase pH, buffer concentration, flow rate, column temperature, detector wave length, etc.) the optimization of HPLC methods for attaining the desired separations are complicated procedure [2]. These techniques helped in the development of statistical models which explained the significance of these variables on the desired responses.

The peak separations in HPLC mostly depended on adjustable mobile phase variables such as viscosity, flow speed, buffer pH, content and certain innate attributes of matrices, stationary phase type, surrounding factors like temperature etc. [2]. For a long time, the HPLC methods have been developed by laborious trial and error approach by changing one factor at a time and keeping other factors as constant. This approach involved a lot of time, is costly and a laborious procedure besides being unable to remove flaws, erratic, and even complete failure [3].

A large number of book chapters, review articles, research articles have been reported on chemometrics thus emphasizing its increasing importance in analytical chemistry. Rozet *et al.* described design of experiments, an important feature of quality by design methodology to describe the design spaces [4]. Number of approaches of experimental design methods have been examined for detecting and removing the impurities in environmental analysis. [5]. Certain complex extraction procedures involving experimental designs have been reviewed for some analytical methods [6]. Dejaegher & Heyden have reported some recent advances in optimization procedures using experimental designs [7].

But still a detailed review of QbD design of experimental techniques in HPLC method development and validation is desired. In the present work we have presented a detailed recap of reported articles on design of experimental techniques for analytical method development and validation on HPLC. The list of experimental design techniques for method development and validation of chromatographic methods are given in Table 3.

2.0 Mathematical Experimental Design Model

The mathematical model is an expression denoting the relationship between the independent variables and the dependent responses. It presents a way to depict the relation between the variables and the responses. Mainly it is a set of polynomials. Given below are the most commonly used mathematical equations 1 to 3 of the linear model.

$$R(y) = a_o + a_1 X_1 + a_2 X_2 \quad \text{(i)}$$

$$R(y) = a_o + a_1 X_1 + a_2 X_2 + a_{12} X_1X_2 \quad \text{(ii)}$$

$$R(y) = a_o + a_1 X_1 + a_2 X_2 + a_{12} X_1X_2 + a_{11} X_1^2 + a_{22} X_2^2 \quad \text{(iii)}$$

Where, R(y) denotes the response. X_1 and X_2 are the independent variables, a_o is the intercept a_1 and a_2 are first order criteria, a_{12} is an interaction criteria, a_{11} and a_{22} are second-order criteria, respectively.

The variables of equation (i) and (ii) are linear showing a plan surface and a distorted plane respectively. The quadratic variables in equation (iii) shows a distorted curved plane. The 3-D plots describes the effect of independent variables on the responses. The contour plots shows the parts of the response peaks. The design of experimental technique helps the analyst to understand the relationship between the critical responses and independent variables, the interaction between them and other complexities [8,9]. The data given by the mathematical model are analyzed statistically and inferences are made using multiple linear regression [10]. Flow diagram of the statistical regression model for the HPLC method development and validation is shown in Fig 2.

3.0 HPLC Method Development

A pictographic Fish-Bone figure (Fig. 3) shows the number of variables affecting the response factors. The multivariate design of experiment technique is used to revamp the response factors by adjusting the independent variables simultaneously. Against this if a univariate

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EDUCREATION
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TROPANE ALKALOIDS ESTIMATION IN SUSPENSION CULTURES OF *Datura innoxia* Miller.

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Abstract

The tropane alkaloids present in Datura species mainly atropine and scopolamine have been used in various pharmaceutical preparations for their therapeutic activities and hence, these alkaloids are in demand. The amount of solanaceous alkaloids present in Datura innoxia is in small quantity, hence the aim of present study was to develop a tissue culture technology to produce its constituents in high concentration on liquid medium and to estimate the production of these tropane alkaloids in the cultured cells. A rapid, efficient and reproducible callus culture protocol was successfully established for Datura innoxia germinated seedlings on the MS medium supplemented with various growth hormones, resulting in a creamy soft callus. The callus developed was transferred onto a liquid MS medium and was maintained for 100 days resulting in cellular aggregates. The estimation of total Tropane alkaloids in D.innoxia plant organs and suspension cultured cells was done using Vitali-Morin reaction. The content of Tropane alkaloids was found to be higher in genetically transformed culture. The results obtained revealed that the suspension culture of Datura innoxia can be used as an alternative source for production of Tropane alkaloids.

Keywords: Tropane alkaloids, Datura innoxia, Suspension culture, scopolamine, Vitali-Morin reaction

Introduction

Datura innoxia has been used extensively in traditional system of medicine as preanaesthetic agent, in ophthalmology, as antispasmodic drug [1,2]. The natural source of these alkaloids are a very few solanaceous plants and it has always been an effort of the researchers to increase the content of these alkaloids in plants either growing naturally or in cultured conditions. *Datura* species have served as model plants for the development of tissue culture technologies for understanding the process of plant regeneration and a lot of work has already been attempted on increasing the content of the alkaloids in *Datura* species [3,4]. The present study deployed the plant *Datura innoxia,* developing a tissue culture technology to produce its main product scopolamine, an extensively used pharmaceutical, in high concentration on solid and liquid medium. It was done by monitoring the effect of different hormonal combinations on the development of fast-growing cells and by studying the production of the tropane alkaloids in the cultured cells of *Datura innoxia* in MS basal medium.

Materials And Methods

The seeds of *D. innoxia* **(Fig. 1a and 1b)** were collected from the plants growing in the Herbal Garden of Jamia Hamdard, New Delhi, in the months of September and October. The identification of plant material was done by Raw Materials Herbarium and Museum, National Institute of Science Communication and Information Resources, New Delhi.
The previously scarified obtained from disease free plants of *D. innoxia* were treated with a very dilute soap solution for 1 min and then washed thoroughly under running tap water followed by rinsing with double distilled water for 3-4 times. *D. innoxia* seeds were surface sterilized by 1% sodium hypochlorite treatment for 10 min, followed by repeated washings with sterile double distilled water [5,6]. All the experimental work was carried out under strictly aseptic conditions in laminar air flow bench fitted with a bactericidal U.V. tube. The floor of the chamber was thoroughly swabbed with cotton dipped in alcohol. The surface of all the vessels and other accessories such as instruments (spatula, forceps, scalpels, blade and gas burner) were also cleaned with alcohol. The chamber was then sterilized with U.V. rays continuously for 1hour. Body parts inside the inoculation chamber such as hands and arms were scrubbed with alcohol before inoculation.
For increase in % germination of seeds, they were treated aseptically with gibberellic acid (10 ppm) and warm water for 1 hour. Then seeds were transferred aseptically with the aid of sterile forceps into sterilized petridishes having sterile cotton pad and filter paper, moistened with sterilized water and wrapped with aluminium foil. These petridishes were then kept at room temperature. The 12 days old germinated seedlings **(Fig.1c)** were inoculated in sterilized solidified slants containing Murashige and Skoog (MS) medium.

Fig. 1a: *Datura innoxia* plant

Fig. 1b: Seeds of *Datura innoxia*

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EDUCREATION
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SEPARATION AND ISOLATION OF SWERTIAMARIN FROM *ENICOSTEMMA LITTORALE* BLUME BY USING FLASH CHROMATOGRAPHY

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Abstract
Swertiamarin was successfully separated and isolated from *Enicostemma littorale* by using flash chromatography technique. Swertiamarin, was obtained as colorless crystals with a yield of 10.25% with purity (~98%) from the mixture containing swertiamarin. Identification and structure elucidation of isolated swertiamarin was done by melting point, TLC fingerprinting, HPTLC and different spectroscopic techniques (MS, FTIR, and ^{1}H-NMR), respectively. In this study, the fast, simple and efficient isolation of swertiamarin was carried out by flash chromatography which can be applied to the preparation of reference substance of Swertiamarin. So using this method the pace of research on swertiamarin will be increased.

Keywords: *Swertiamarin, flash chromatography, separation, isolation, Enicostemma littorale.*

1. Introduction

Separation and isolation of pure phytoconstituents from the extracts of natural sources mostly done by applying chromatography. However, it is very difficult that the pure phytoconstituents is obtained in a single step purification process and it can be easily achievable by the combination of one or more chromatography techniques [1]. Here, we report the efficient isolation of swertiamarin from Mamejava (*Enicostemma littorale* Blume) alcoholic extract using flash chromatography (CombiFlash Rf 200 Teledyne Isco, Nebraska, USA). Swertiamarin is the phtyoconstituent of plants like *Anthocleista procera*, *Enicostemma littorale, Swertia chiraytiya, Swertia davidi, Swertia patens, Swertia mileensis, Swertia pseudochinesis* [2,3] and represented as a biological lead compound of *Enicostemma littorale.* Swertiamarin displays a variety of pharmacological actions [3,4,13–19,5–12]. The separation, isolation and purification of bioactive compounds with purity, good quality as well as in quantity from a crude extract or fractions of an extract is a long and expensive process. Flash chromatography gives a inexpensive solution for the separation of mixtures from natural products which require moderate resolution [20]. It provides good separation in a short time under a proper chromatographic condition [21,22]. Thus, the separation of swertiamarin from *Enicostemma littorale* by flash chromatography which has not been done earlier.

Isolation of swertiamarin was done by solvent fractionation [18], column chromatography using silica gel (60-120 mesh) [23–25] and by centrifugal partition chromatography [25] from different *Enicostemma* and *Swertia* species. In our previous report, isolation of swertiamarin by using column chromatography with improved yield of swertiamarin was done [19]. But, column chromatography is considerable time consuming [26] for the separation and isolation of swertiamarin from different plants. In search of new fast and less time consuming process, we developed a method for the isolation of swertiamarin by fractionation of *Enicostemma littorale* alcoholic extract by column chromatography.

2. Materials and Methods

2.1 Equipment's and Materials

Rotary evaporator (R-210) was used for solvent evaporation and pre-coated TLC plates (silica gel 60 F254 (E. Merck), p- anisaldehyde reagent (Spectrochem), UV-cabinet (CAMAG), silica gel (particle size 40–60 µ/230-400 mesh) (Merck, Germany), melting point apparatus (VEEGO-VMP-PM), twin trough TLC chamber (10x10), HPTLC (CAMAG) were used during swertiamarin isolation. The solvents used for flash chromatography were analytical grade and were purchased from Fisher Scientific. The separation of SWR was carried out on an automated flash chromatography system (Combi*Flash* Rf 200, Teledyne Isco, Lincoln, NE, USA).

2.2 Collection and authentication of plant material

Whole plant of *Enicostemma littorale* Blume (ELB) was collected from Dharampur, Valsad district in November 2012, authenticated by a taxonomist and identity confirmed by referring to Flora of Gujarat [26]. Voucher specimen no. NIPER-A/NP/1112/05 was preserved at NIPER- Ahmedabad, India. Plant material was dried in a hot air oven at 37°C, powdered and stored in an air tight container for further use [27].

2.3 Factionation of Enicostemma littorale Blume alcoholic extract by column chromatography

Powdered material (100 g) was extracted with absolute alcohol (5 x 200 ml) on a shaker at 70 rpm until the extraction no observation of swertiamarin (SWR) was found in thin layer chromatography (TLC). The solvent was removed under reduced pressure at 40°C in a rotary evaporator. The alcoholic extract obtained was treated with cold diethyl ether to obtain 29.5 g of a precipitate. The precipitate was loaded on a chromatography column with slurry of silica gel (60–120 mesh, E. Merck, Germany) and elution was done with petroleum ether followed by gradient elution containing ethyl acetate (0–80%). Ethyl acetate/petroleum ether (81:19 v/v) fractions were monitored by co- thin-layer chromatography (co-TLC) for swertiamarin. Fractions containing SWR were pooled and concentrated to dryness. The weight of dried mixture of compounds was 200 mg which was further subjected to flash chromatography separation.

2.4 Sample Preparation for Flash chromatography

Before preparation of empty solid sample cartridge it was assured that it had a bottom frit or not. The sample mixture (200 mg) was dissolved in binary solvent system (chloroform and methanol) and adsorbed on silica gel (40-60 µm (240-400 mesh) by using rotary evaporator under reduced pressure. The sample was loaded into cartridge which was tapped on bench top to settle the mixture. The frit was placed on the top of cartridge and forced down against the mixture using plastic plunger. The extra residual powder inside the cartridge was wiped out and capped. The solid sample cartridge with cap was loaded on the sample injection port.

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EDUCREATION
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COMPARATIVE SUCCESS OF NATURAL SUPERDISINTEGRANT AND SYNTHETIC SUPERDISINTEGRANT IN IMMEDIATE RELEASE TABLET OF AMLODIPINE FOR ANGINAPECTORIS MANAGEMENT

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Abstract

Immediate release/fast distintegrating tablet has been recognized ever increasing in demand during last some decade inpharmaceutical field. Amlodipine is a long-acting calcium channel blocker dihydropyridine derivative commonly used for the treatment of angina and hypertension. Oral bioavailability is restricted due to high first-pass metabolism.To overcome this problem in the present investigation immediate release tablet of amlodipine developedby usingsynthetic superdisintegrant(sodium starch glycolate) SSG and natural superdisintegrant(locust bean gum)at different concentration and their combination and the comparative success of natural and syntheticsuperdisintegrant in disintegration time by direct compression. Precompression parameter like angle of repose, moisture content, particle size estimation, bulk density, tapped density, carr'sindex, hausner ratio and post compression parameter like thickness ,drug content, wetting time , uniformity of weight , friability, dispersion time, disintegration time(DT), in vitro dissolution study , stability study are studied. F5 formulation showing maximum optimum activity optimize in form of immediate release tablet of Amlodipine.

Keywords: AmlodipineDirectcompression ,Disintegrating time ,Locust bean gum, Sodium starch glycolate .

Introduction

Oral route is highly appropriate and most favored route of administration due to different factors such as ease of administration, high patient compliance, self-medication, accuracy in dosing one major drawback of this type of dosage is dysphagia (difficulty in swallowing) in geriatric, and another are patient suffering fromAlzheimer ,Parkinson diseases , sudden allergic episode, thyroid disorder ,motion sickness also result to non -patient compliance. To solve this problem major new approach in different form are present one of them is novel drug-delivery system main target to enhance the patient compliance safety and efficacy profile of the dosage form by formulating immediate release tablet .The development of solid dosage immediate release tablet result to enhance the oral dissolution fast absorption which ultimately increase thebioavailability of the drug. Immediate release tablet are formulated by various method such as directcompression solid dispersion method, lyophilization sublimation method, melt extrusion method , wet granulation method, compression molding method theyreveal the different disintegration property . The basic method for the developingof immediate release tablet in this paper use of synthetic as well as natural superdisintegrantad comparative success in the disintegrating rate . In the research study SSGused as synthetic superdisintegrant and locust bean gum use as natural superdisintegrant screened out and using direct compression method for the preparing of immediate release tablet of amlodipine. .Angina pectoris is chest pain that is caused by heart muscle ischemia due to coronary artery obstruction or spasm. Amlodipine is a long-acting derivative of dihydropyridine commonly used for treating chronic stable angina, vasospastic angina and hypertension. It inhibitsthe calciumion transmembraneinfluxinto vascular smooth muscle and cardiac muscle. Peak plasma concentrationsarereached 6-12 h. It has oral bioavailability of 64-90% and half-life of about 30-50 h. Amlodipine belongs to BCS class 1 (Highly solubility Highpermeability)More ever, drug molecule that undergoes pre-gastric absorption when formulated as immediate may show increased oral bioavailability.It provides good stability, appropriate dosing, easyproducing. In the present research we have deal with the development of safe and effective immediate release formulation of amlodipineby direct compression method withlow disintegrating time andadequate hardness and excellent release profile.

Materials And Methods

Material

Amlodipine and sodium starch glycolate is obtained from the Aurobindo pharmaceutical, Hyderabad,mannitol, microcrystalline cellulose PH 102, flavour, Locust bean gum, Magnesiumstearate ,Talc obtained from KIET school of pharmacy, Ghaziabad, India. The other ingredient wereused of standard grade of laboratory.

Methods

Immediate release tablet containing 10 mg of amlodipine were prepared by Direct compression method.It is one of the simplest and cheapest method widely used to formulate variety of tablet because it require less processing steps as compared to another techniques. All the required quantity of ingredients sodium starch glycolate, locust bean gum in the different ratio, MCC PH 101, lactose pass through the 60 no sieve before mixing and add 10 mg amlodipine the mix the blend thoroughly magnesium stearate, talc and mint flavour were added in the last and mixed. The powder blend evaluated for the pre compression parameter and after the evaluation powder blend punch by single stationary punching machine with 6 mm flat punch.

Table 1: Formulation of amlodipine immediate release tablet.

Batch No.	F1	F2	F3	F4	F5
Ingredients	**Formula (mg per Tablet)**				
Amlodipine	10	10	10	10	10
SSG	2.5	1.5	3.5	2.5	3.5
Locust Bean Gum	1.5	2.5	2.5	3.5	4.5
MCC	95	93	90	89	85
Mannitol	46	48	49	50	52
Magnesium Stearate	3	3	3	3	3
Talc	2	2	2	2	2
Total	150	150	150	150	150

Determination of λ max of amlodipine

The UV spectrum of amlodipine was obtained by using a UV-visible spectrometer (UV-2450, Shimadzu). Accurately weigh 10 mg of the drug added to 100 ml of

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EDUCREATION
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DEVELOPMENT AND CHARACTERIZATION OF A NANOEMULGEL FORMULATION OF CURCUMIN FOR THE TREATMENT OF SKIN INFLAMMATION

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Abstract
The main objective of this study was to formulate and characterize nanoemulsion gel formulation for poorly water soluble drug and to improve the permeability and solubility and to sort out the issues related to Curcumin. The Various Nanoemulsion constituents like oil, surfactant and co-surfactant was carefully chosen on the basis of their solubility and ability of emulsification with each other. Nanoemulsion was prepared using spontaneous or self emulsificationtechniquewhich was further incorporated into HPMC K4M to convert it into nanoemulsion gel. The nanoemulsion gel contains 1ml olive oil, 1ml Tween20 as a surfactant, 3ml PEG400 as a co-surfactant, 1ml water, 50mg drug, 5ml of Ethanol and 2% of HPMC K4M. Drug loaded nanoemulsion gel were characterized for particle size by using viscosity, percentage entrapment efficiency, in-vitro drug release and spreadability.HPMCK4M (2%) was found to be appropriate for forming a gel of prepared nanoemulsion according to its ease on spreadability and consistency. The in-vitro permeation of Curcumin was enhanced in comparison to conventional Curcumin. The limitations of poor bioavailability and low stability of Curcumin can be overcome by the formulation of nanoemulsion gel. The hydrophobic drug like curcumin can be effectively used in the nanoemulsion gel formulation. Spontaneous or self emulsification technique was found suitable for nanoemulsion gel formulation of curcumin.

Keywords: Curcumin, nanoemulsion, gel, spontaneous technique, skin disorders.

Introduction

Skin inflammation is one of the most common issue in dermatology. Inflammation is a defense mechanism of the body as it is serves as the natural way of protecting itself against the injury and various infections. Skin inflammation is the occurrence of rashes followed by skin itching and redness and it may can lead to chronic conditions like dermatitis, allergy, acne, sun burn, rosacea and psoriasis. There are basically different types of skin inflammation that is acuteinflammation and chronic inflammation. Acute inflammation is the body's instant response to negative stimuli.While chronic inflammation is due to the environmental stresses and unhealthy lifestyle habits. Curcumin (1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione) is a constituent of Curcuma longa family belonging to Zingiberaceae, chemically known as diferuloylmethane is one of the famous ingredient in Indian spice and recognized for its extensive medicinal properties due to its anti-inflammatory, anti-microbial,anti-oxidative, anti-carcinogenic and anti-mutagenic. There are some of the novel formulations of curcumin which have being developed are Liposomes, transdermal patch, solid lipid nanoparticles, nanoemulsion and microspheres etc.

The Oral administration of curcumin is hindered due to the poor bioavailability as it undergoes extensive first pass metabolism discovery process so that suitable data as such physical and chemical data is attained. Melting point of curcumin was determined using Capillary tube method.

Solubility Studies

The solubility study of the curcumin was carried out by taking 2ml of different oils in small stoppered vials and the excess amount of curcumin was added into it. The tightly stoppered vialswas kept in mechanical shaker for 72hrs at 37±5ºC to reach the equilibrium. From the mechanical shaker the sample was removed and centrifuged for 15min at 2000rpm. After centrifugation supernatant was taken and filtered by usingthe membrane filter of size 0.44µm and appropriately diluted with ethanoland amount of drug content was measured using UV-visible spectroscopy at 424nm. The same method was followed for determining the solubility in surfactant and co-surfactant of curcumin.

Determination of melting point

For the determination of the melting point of the curcumin capillary tube was being used. In a capillary tube a specific amount of the curcumin was taken and was closed at one end of it and kept in the apparatus used for melting point determination ,further the temperature was recorded.

mainly due to unconjugated curcumin molecule, which is hydrophobic in nature that means it is very poorly absorbed in gastrointestinal tract after the oral ingestion of curcumin a very lesser traces of curcumin is found in blood and tissues. Incontrast topical formulation of curcumin showed better absorption through skin specially when the skin barrier becomes weak as in case of skin injury, infection and in diseased condition.Topical formulations of curcumin are helpful in many of the skin conditions but particularly associated with skin injury and skin inflammation. Most of the inflammatory diseases occurs mostly near the surface of the body(locally), topical application of curcumin on the site of
inflammation can leads to advantageous effects of delivering the drug directly to the diseased site and producing its local action. These are the factors which are responsible for potential topical therapeutic value of curcumin more promising than oral administration ofcurcumin.

Nanoemulsion gel is basically is the combination of the emulsion and the gel together where the emulsion can be used in both of the types that is O/W and W/O as a vehicle for delivering the drug into the skin. These nanoemulsion gel has many advantages over classic emulsion or classic gel like easy spreadability, lesser greasiness, thixotropic, water soluble, easy removal from the skin, bio-friendly and longer shelf life of it. The nanoemulsion gel has being formulated to overcome the low viscosity issues related to nanoemulsion which restricts the topical application of it and the another factor is the presence of ingredients of nanoemulsion gel namely oil, surfactant and co-surfactant escalate the permeation of the drug by enhancing the partition coefficient of the drug towards the skin. The topical nanoemulsion gel is superior over the conventional formulations of the hydrophobic drugs because of its better permeation and enhanced therapeutic efficacy. Thus the nanoemulsion gel has all the positive aspects to become safe, effective and well accepted drug delivery system for topical delivery of hydrophobic drugs.

Materials and methods

Materials

Curcumin was obtained from Central Drug House(New Delhi), HPMC K4M was obtained from Sigma Aldrich (Delhi), PEG 400, Tween 20 and Olive Oil was purchased from Central Drug House (New Delhi). All other chemicals were of analytical grade.

Preformulation studies

Preformulation studies is the process of optimizing the drug delivery through the determination of the physical and chemical properties of the drug molecule that will affects the drug performance and development of the safe and effective dosage form. These preformulation studies confirms that there is no barrier towards the product development. It is a initial step in the drug

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MANAGEMENT OF OBESITY BY DIFFERENT STRATEGIES

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Abstract
Obesity is a problem in developed countries like the US as well as in developing nations like India. "It is so frequent that obesity is one of the major contributors to ill health in replacing traditional public health issues, including malnutrition and infectious disease."The World Health Organisation and national health institutes define obesity in Class I, Class II and Class III (as 30-34.9, 35-39.9 and greater than 40) is further characterized by BMI. Sympathomimetic drug like phentermine has cardio stimulative properties. It's been tested only in short-term trials and is a controlled substance in the United States. Orlistat is the appropriate medication in this group and is approved for the use in teenagers. Lorcaserin is an agonist of a specific receptor serotonin 2c. It is notable for its tolerability and low side effect rate. Physical training helps combat the permissive and wealthy environment that predisposes individuals with reduced obesity to gain weight.

Keywords: Agonist, Obesity,Receptor, Sympathomimetic, weight

Introduction

Obesity is a disease caused by a health damaging buildup of extra fat [1]. The rising prevalence of obesity(defined as a BMI >30 kg/m^2) requires preventive measures to decrease the potential health and economic costs of this issue worldwide [2].Before the early 1970s, severe obesity was extremely rare but has since increasing faster than obesity, with no clue of retard [3].It is a very complex medical condition that arises from the genotypical vs. environmental factor interaction [4]. Obesity has been recognized for over 40 years as a major public health issue. It continues to rise rapidly among those who are overweight. The growing trend of diabetes is driven primarily by obesity. Genetic factors provide an important explanation for these events and account for up to 20% of the BMI variance; environmental factors also play a significant role[5]. obesity is also an important factor in many illnesses that are non-transmitted, including diabetes mellitus, cardiovascular disease and cancer [6].

In addition to the short-term extreme weight loss, the first diagnosis of overweight and obesity patients requires an intensive procedure, which involves diet and nutrition, regular physical activity and behavioral change [7].Obesity treatment today incorporates hypocaloric diet, surgery and medications. Hypocaloric diets are sluggish to achieve desirable results whereas pharmacotherapy and surgery are costly in addition to their dangerous side effects [1]. This article reviews the strategies for the management of the obesity and their outcomes.

Epidemiology

Although the epidemic of obesity began to rise sharply in the 1980s, it was only since 1997 that the WHO and many national governments understood the importance of obesity as a serious public health problem that affects both developed and developing countries.The epidemic of obesity in children and adults showed that this appears to be steadily rising, with 20% of all adults already obese in most European countries and higher rates often found in the countries of Southern, Central and Eastern Europe. Likewise, the Middle East is extremely obese and is also the most prevalent country in the world for type 2 diabetes [8]. The two countries with the greatest rates of overweight and obesity were the American and the European ones. Throughout the Americans, overweight prevalence increased from 45.3 per cent to 64.2 per cent and obesity prevalence increased from 12.9 per cent to 28.3 per cent (from 1980 to 2015).The highest rates for both obese and overweight are in the US and Mexico. The overweightprevalence in the European region rosefrom 48 per cent to 59.6 per cent and that of obesity from 14.5 per cent to 22.9 per cent from 1980 to 2015. The rates ofprevalence of overweight and obesity within each of these two areas were fairly consistent across countries. Turkey and the USA have respectively had the highest excess weight and obesity levels in 2015, while France and Colombia have respectively the lowest prevalence rates in the American and European areas [9].The prevalence of obesity is growing, but only a few countries have tried to quantify the economic costs of obesity [10].

Different strategies used for the management of obesity

Diet

Dietary counseling is a pillar of the treatment for weight loss. The majority of the dietary regimens suggested for losing weight, focus on energy content and the content of macronutrients.NIH(National Institute of Health) advises that persons with overweight or obese Class I and two or more risk factors may limit their consumption of energy by 500 kcal per day.People with Class II and Class III obesity should aim to limit their energy intake by 500–1000 kcal per day. A weight loss of 0.5 kg per week can be accomplished with a reduction of 500 kcal per day energy intake[11].

Obese people generally prefer highly processed foods with simple sugars to complex / raw carbohydrates and therefore a diet that promote consumption of sugars and refined carbohydrates that can exacerbate weight issues and facilitate dyslipidemia, especially in those with resistance to insulin. Due to the questionable effectiveness of these diets, there has been an increase in the interest in very low carbohydrate ketogenic diets (VLCKD), or simply ketogenic diets (KDs)[12]. There are also various types of diets used for controlling weight like low carbohydrate diet, low-fat diet, low-glycaemic-index diet, high protein diet [13].

Exercise

For overweight and obese adults, exercise leads modestly to weight loss. Exercise can reduce abdominal fat. Exercise increases mobility for cardiorespiratory fitness, it can help to keep weight loss. Exercise must be an integral part of the treatment for losing weight and itsmaintenance [7].Exercise alone is not an efficient way to achieve the initial weight loss, although most people who are overweight or obese prefer to choose exercise as their first interventional choice [11].Regular physical activity prevents weight gain which often goes hand in hand with aging. Increasing physical activity helps in the determination of the negative energy balance needed in weight loss. Thermodynamic principles make it very difficult for humans by exercise alone to lose significant amounts of weight or at least to lose weight quickly [14].

Pharmacotherapy

Drugs are the last attempt to retain optimum weight. Weight slips insidiously on, so instead of instantly it should be taken off in a slow and steady manner. Medicines assist in the treatment. Drugs alter the human body's basic metabolic process and thus regulate its weight. The side effects weigh the benefits out. Drugs targeting obesity are a long-term solution to obesity. There are number of drugs available in the market like orlistat,

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ROLE OF ARTIFICIAL INTELLIGENCE IN HEALTH CARE

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Abstract
Artificial Intelligence (AI) has wide-reaching potential and deals with various technical tasks, which would otherwise only be expressed in human brain. AI helps in investigation of new drugs as well as target based drug development, which reduces the cost and time consumed for of research and development. There are several pharmaceutical branches, where AI approaches (algorithms, machine learning, natural language processing, etc.) are used for the diagnosis and treatment of diseases ultimately leading to benefits of human being. AI based methods have been applied reasonably in various pharmaceutical areas for development of biogenic eyes, artificial taste buds and drug development and drug discovery software. This paper gives a summarised overview of role of AI in various sectors of health care with its pros and cons.

Keywords
Artificial Intelligence, Healthcare, Drug Discovery, Machine learning

Introduction

Artificial Intelligence (AI) is now becoming an important part of drug development. As we have massive amount of data which now looking for human genetic medicines specifically for their treatment. Human Genome Project (HGP) is one of the common example and most important part of AI. As AI is considered be coming true of a fantasy in pharmacy field with respect to designing of more efficient drug by using human genetic code with the help of different software. These kinds of evolutionary practices in the field of health care, day by day leads to the acceptance of AI in health system. Today AI is to be considered more efficient and effective over human beings. The ability of AI of recognizing patterns and recalling from its previous data base for diagnosing conditions is considered to be its greatest strength. AI can also detect the right people for clinical trials. So if we look at the stages of the drug development process for which AI is being adopted [1-5].

Early stage includes the identification process of the drug which you might have studied in HGP and also looking for ways to improve different molecular reactions. AI can also work's biased in research by analysing the chemical, molecular and medical data for identifying new targets.

Types of AI in Health Care

a) Machine Learning:
It is a method by which scientist learns the human data in statistical form for predicting the patient's disease and its treatment. Convolutional Neural Network (CNN) is the advanced form of machine learning which was inspired by the connectivity pattern in between the neurons which represents the formation of the animal visual cortex [6-10].

b) Natural Language Processing:
Understanding the human language and making its sense has been the motive of AI researcher's from 1950's. Natural Learning Processing (NLP) basically includes various applications such as recognition of speech, text analysis, and translation and may more.

c) Rule-Based Expert System:
In the field of heath care rule based expert system is being pre-dominantly used commercially since 1980's. These rule based expert system were broadly employed in health care field for clinical decision support purposes for about couple of decades and still being widely use today [10].

d) Physical Robots:
About 200,000 of physical robots every year are installed in industries across the world. USA became the first country in 2000 to approve surgical robots for their surgeons to enhancing their abilities to create veracious and slightest incisions, wound stitching etc. Gynaecologic surgery, prostrate surgery, and neck and head surgery are the various surgeries in which physical robots are involved [11].

Application of AI in Healthcare

AI is implemented in healthcare with the primary aim to analyze relationship between disease prevention and patient outcomes. Some of the major areas with effective AI implementation are narrated below [12-14].

1. Management of medical record and other data.
2. Designing of treatment.
3. Digital consultancy.
4. Management of medications.
5. Creation and designing of drugs.
6. Monitoring of health.
7. Reduction in error of dose.
8. Participation in clinical trials.

Diagnosis

Artificial Intelligence can also be used for the detection of Alzheimer's disease (AD) as the doctors came to know that by using artificial intelligence they have detected that the patients suffering with this disease most often use proper nouns instead of using pronouns in their early stage of disease. Google is also helping artificial intelligence in detecting the various deficiencies in human body just by recognising their facial expressions. AI is focusing on reducing the cost and improving quality of medicines for patients [15-20].

Treatment

BENEVOLENT AI has identified the drug which can prevent the death of neurons and prevents humans from diseases of motor neuron. Scientists were not much familiar with Artificial Intelligence at the early stage in the terms of clinical trials for their identifications [21-26].

Patient Engagement and Adherence

Patient engagement and adherence has been the greatest problem of health care and the ultimate barrier between ineffectual and satisfying health outcome. Increment in the active participation in their self well-being and care, the better will be the results. Failing to make essential behavioural acclimation and not following the treatment course or not taking the prescribed drugs on time is the biggest problem [28, 29].

AI Ethics in Health Care

In the last few years, AI has impacted the healthcare sector. The requirements for ethical implications are increasing as there is a need to minimize ethical risks associated with AI implementation. Some of the risks are threats to privacy and confidentiality, informed consent, and patient autonomy. The ethical policies are needed to be framed and implemented to consider integrate AI in clinical practice. Some of the important points to be considered for the need of AI ethics are as follows [30].

- Privacy and data security of the patient.
- Transparency towards patient.
- Patient should not be discriminated.
- Safety assurance of the patient.
- The use of artificial intelligence must be in the favour of the patient.

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EDUCREATION
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FORMULATION AND EVALUATION OF INTRAGASTRIC SUSTAINED RELEASE MUCOADHESIVE ORAL TABLET OF BACLOFEN

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Abstract

Mucoadhesion occurs between two surfaces, one of which is a mucous membrane and another is drug delivery system. The bioavailability of baclofen by increasing the residence time of the drug by preparing gastroretentive mucoadhesive sustained release matrix tablet. Baclofen comes in the category of skeletal muscle relaxant. It is slightly Mucoadhesion had been a topic of interest in the design of drug delivery system to prolong the residence time of the dosage form with the under lying absorption surface to improve and enhance the bioavailability of the drugs. soluble in water, very slightly soluble in methanol, and insoluble in chloroform.It inhibits monosynaptic and polysynaptic reflex transmission at spinal level, probably by stimulating the GABAB receptors which in turn inhibit the release of found to be dependent on the composition of the polymer in the tablet.

Keywords: Mucoadhesion, Bioavailability, Mucoadhesive retention time, Mechanism of mucoadhesion

Introduction

Baclofen, a centrally acting skeletal muscle relaxant, it is found to be fast absorption and elimination pattern and having absorption window in the upper gastrointestinal tract which may lead to low bioavailability[1].Gastro retentive dosage forms are designed or formulated to sustained and prolong the release of drug to the stomach[2].An ideal dosage form is one, which attains the desired therapeutic concentration of drug in plasma and maintains constant for entire duration of treatment. This is possible through administration of a conventional dosage form in a particular dose and at particular frequency[3].Reduction in fluctuation in steady state levels and therefore better control of disease condition and reduced intensity of local or systemic side effects [4].Fast GI transit results in an incomplete release of drug in the absorption zone and diminishes the efficacy of the dose[5]. Theadvantages of controlled drug delivery system over the conventional dosage form are as follows

- Improved patient convenience and compliance due to less frequent drug administration.
- Increased safety margin of high potency drugs due to better control of plasma levels.
- Maximum utilization of drug enabling reduction in total amount of dose administered[6]

The present investigation aimed to improve the bioavailability of baclofen by increasing the residence time of the drug by formulating gastro-retentive mucoadhesive sustained release matrix tablet [7]. Different formulations of mucoadhesive Baclofen tablets were prepared using a different concentration of guar-gum, carbopol 974P, and combination of both.[8]

Materials and Methods

Materials

Baclofen was procured from KIET School of Pharmacy. Carbopol, Guar gum, Lactose (Anhydrous), Magnesium Stearate, Talc was obtained from KIET School of Pharmacy. glutamate and aspartate. Tablets were prepared by direct compression technique and evaluated for hardness, weight variation, thickness, content uniformity, swelling index, mucoadhesive force, mucoadhesive strength and in vitro drug release. Formulation B3, containing carbopol and guar gum was found to control the release of Baclofen for more than 12 hrs with cumulative percentage of drug release 70.67%. The mucoadhesive studies revealed that batch B3 found to be good mucoadhesive strength and mucoadhesive retention period. For all formulation's kinetics of drug release from tablet followed by Matrix and Korsemever Peppas Model, which states that the release of might follow Non-Fickian diffusion as predominant mechanism of drug release. The swelling and bioadhesion ability were

All other reagents and chemicals used were of analytical reagent grade.

Methods

Preparation of Mucoadhesive Tablet using Direct Compression Method

Sustained release mucoadhesive oral tablet of Baclofen was prepared by Direct Compression Method.

- All the ingredients of tablet are blended in mortar with pestle to obtain uniform mixing.
- The powder of the tablet was then compressed on 08 mm flat surface punch by tablet machine.
- Tablets of Batch B1and B2 contain only single mucoadhesive polymer.
- While Batch B3 contain combination of mucoadhesive polymer.

Table 2. Composition of Baclofen Mucoadhesive Tablet

Code	**B1**	**B2**	**B3**
Ingredients	**Unit Formula (mg per tablet)**		
Baclofen	30	30	30
Carbopol	43	-	45
Guar-gum	-	30	15
Magnessium Stearate	1.5	1.5	1.5
Talc	1.5	1.5	1.5
Lactose	72	87	57
Total	**150**	**150**	**150**

Evaluation Of Powder Blend

Bulk Density (Db)

It is the ratio between total powder mass and bulk powder volume. It was measured by pouring the weighed powder into a measuring cylinder (passed through standard sieve # 20), and the initial weight was noted. This initial volume was referred to as bulk volume. According to the formula mentioned below, the bulk density was calculated. It is in gm / ml, and is given by

Db = M/ Vb

Where, M and Vb are powder mass and bulk powder volume, respectively.

Tapped Density (Dt)

It is the ratio of total powder mass to the powder volume that is tapped. Volume has been measured 750 times by tapping

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EDUCREATION
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DIFFERENT STRATEGIES IN DRUG DESIGNING INCLUDING CHEMOGENOMICS

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Abstract
Chemogenomics unites the most influential ideas in current science and Biology, connecting combinatorial Chemistry with genomics and proteomics.chemogenomics , or concoction genomics, is the foundational screening of focused synthetic libraries of little particles against singular medication target families (model : GPCRs, atomic receptor, kinases and proteases and so forth.) With a definitive objective of distinguishing proof of novel medications and medications targets. Present day chemogenomics is an extraordinary order concentrating the organic impacts of substance mixes on a wide range of natural targets. In the present science, finding of medication structure any sort of malady put a significant job. Medication Institute and Pharma Companies continually doing research with new item under bioinformatic ways. These looks into completed distinctly for their business reason and beat the challenge. Medication configuration, frequently alluded to as reasonable medication configuration, is the creative procedure of finding new medicine dependent on the information on a natural objective. Furthermore, there are various procedures are likewise used to structure a medication.

Keywords: Chemogenomics , Drug design , Drug targets , Strategies.

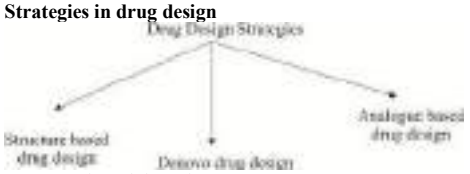
Introduction

Modern chemogenomics is a unique control concentrating the organic impact of concoction mixes on a wide range of natural targets. By and by, bits of knowledge from chemogenomics are progressively utilized for the reasonable aggregation of screening sets and for the sound plan and combination of guided concoction libraries to quickened tranquilize Discovery. Be that as it may, thinking about enormous measures of existing synthetic and organic information (mixes targets and examines), investigation and compelling investigation of the information speak to an intricate issue. Right now explicit issues related with the chemogenomics based information mining methodologies including chemogenomics databases. And furthermore examines about the systems of medication configuration steps engaged with tranquilize planning strategies of medication structuring and procedure of medication planning.

Information mining procedures in the structure of GPCR focused on compound libraries

There are a few strategies for projection calculation dependent on neural and measurable methodologies . uncommonly, topology and separation safeguarding mappings model self arranging highlight guide of Kohonen or separation saving non direct mapping of Sammon. Utilized self sorting out maps (SOM) for examination and of representation of various gatherings of GPCR ligand based on7 determined atomic descriptors. Right now, (1400 mixes). Adreno receptor agonists (433 mixes) had all the earmarks of being grouped at unmistakably various zones of the guide. Such maps for specific gatherings of ligands can be utilized for anticipating potential subtype explicit movement. A virtual screening technique dependent on a topological pharmacophore comparability and SOM was applied to streamlining a library of P1 purinergic human A2A receptor enemies. At first, a SOM was created utilizing a lot of organically tried atoms to built up a primer structure movement relationship (SAR). A combinatorial library configuration was performed by anticipating practically collected new particles onto the SOM. A Small center library of 17 chose combinatorial items was integrated and tried. By and large satire planned structures yielded are triple littler restricting consistent (33 versus-100 nm) and 3.5 - overlap higher specifically (50 versus 14) than the underlying library.A most particular compound uncovered a 121 crease relative selectivity for A2A versus A1. This outcome exhibited that it was conceivable to plan a little, action advanced centered library with an improved property profile utilizing the SOM virtual screening approach. The methodology may be especially helpful in ventures where structure best plan can't be applied on account of an absence of receptor structure data, for instance in the numerous tasks targeting discovering vagrant G protein coupled receptor (oGPCR) modulators. By difference to SOM, non - straight maps (NLM) speak to every single relative separation between all sets of mixes in the 2D form of descriptors space. The separation between two focuses on the guide straightforwardly reflect likeness of the mixes.

Strategies in drug design



Structure based drug design

There must be integral restricting district present in restricting site of receptor or catalyst.

The medication would then be able to be combined and tried for movement. On the off chance that it demonstrates dynamic, the objective protein can be solidified with the new medication authoritative to restricting site and afterward X-beam crystallography and sub-atomic displaying can be utilized again to distinguish the structure of complex and to check whether restricting occurred true to form. This is called structure-based medication plan.

Denovo drug design

- Involves the design of Novel drug structure based on the knowledge of binding site alone.
- This can lead to a novel lead compound successfully, which can then be a start point of structure based drug.
- Position of atoms in crystal structure is accurate to 0.2–0.4Å.
- Flexible molecules are better than rigid as they find alternative binding conformation
- Hit and trial.
- Chances of hitting ideal structure are poor.
- Denovo does not identify whether the structures identified will have favourable pharmacokinetics/safety.

Analogue based drug design

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APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN MEDICAL DATA RETRIEVATION AND ITS IMPACT ON DISEASE DIAGNOSIS

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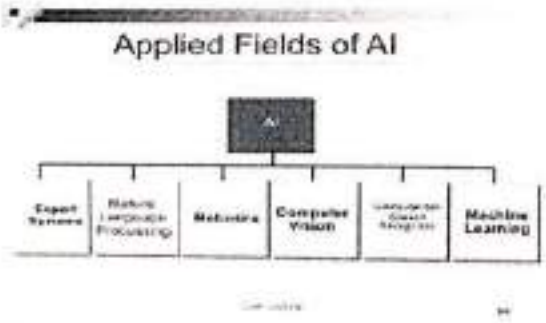
Abstract
Man-made brainpower is a part of software engineering that means to make wise machines , which turns into a fundamental piece of innovation industry. Man-made brainpower in medicinal services is the utilization of complex calculations and programming to imitate human perception in the investigation of muddled restorative information particularly. Artificial knowledge is the capacity for PC calculation to inexact ends without direct human information. It is bringing a change in perspective to social insurance information and Rapid program of investigation methods. Computerized reasoning can be applied to different kinds of medicinal services information (sorted out and disorderly information) mainstream man-made brainpower strategies incorporate machines learning technique for composed information, for example, the old style bolster vector machine and neural system and the advanced profound learning just as Natural Language Processing, for example, python for chaotic information. The essential point of wellbeing related man-made reasoning application is to investigate the connection between counteraction or treatment systems and patient results.

Keywords: Algorithm , Aritificial intelligence , Healthcare , Neural Network.

Introduction

The expression man-made consciousness is when all is said in done alludes to figuring advances that comparative procedures related with human knowledge, for example, thinking ,learning, neural getting, change and connection. By and by, most uses of man-made reasoning are restricted in that they are just ready to complete explicit assignments or take care of foreordained issues . Man-made brainpower in an assortment of ways, drawing on standards and instruments including from maths, rationale and Biology. The primary highlights of current computerized reasoning is that they are continuously ready to comprehend differed and disorderly kinds of information, for example, Natural Language content and pictures. Al has been the best sort of computerized reasoning in most recent years and is the hidden methodology of a significant number of the applications by and by being used.



Types of artificial intelligence of appropriateness to Healthcare

Artificial intelligence is not single technology , but preferably a group of them . Almost all of these technologies have instant appropriateness to the Healthcare area, but the particular operation and job they support change broadly some specified artificial intelligence technologies of excessive significance to Healthcare are explained and report below:

Al

Machine learning is a use of man-made brainpower that enables frameworks to automated gain and improve from episodes without being communicated modified. Al focus on the improvement of PC programs that can get to information and use it learn for themselves.

Profound learning

Deep learning is a piece of a more extensive level of Al strategy situate on counterfeit neural systems with delineation learning. Learning can be super plan, semi superintend or un superintend.

Neural network

Artificial neural network or assembler system are computing system roughly effects by the biological neural network that initiate animals brains. Such frameworks "learn"to execute task by wearing model for the most part without being program with task explicit principles.

Advantages of artificial intelligence

Decrease in human blunder

The expression " Human mistake" was conceived in light of the fact that human commit errors every now and then, PCs, be that as it may, don't commit this error on the off chance that they are customized accurately.

Faces challenge rather than people

This is one of the most stretched out bit of leeway of man-made consciousness. We can defeat any hazardous impediments of people by creating and man-made reasoning robot which thus can do the things for us.

Accessible 24 x 7

A normal human will work for 4 to 6 hours daily barring the breaks.

Aiding in tedious employments

In our everyday work , we will perform numerous monotonous works like sending an expressing gratitude toward mail, checking certain reports for blunders and a lot more things. Utilizing computerized reasoning we would productivity be able to robotize this Mundane undertakings and can even evacuate "Exhausting" assignments for people and treat them up to be progressively imaginative.

Computerized help

Some of the profoundly propelled associations utilize advanced help to interface with clients which spares the requirement for HR. The computerized help likewise utilized in numerous sites to give things that clients need.

Quicker choices

Using computerized reasoning nearby different advancements we can settle on machines take choices quicker than human and complete activity snappier.

Day by day applications

Daily applications, for example, Apple Siri, window 's Cortana, Googles OK Google are regularly utilized in our every day schedule whether it is for looking through an area, taking a selfie, answering to a mail and some more.

Challenges of artificial intelligence

Significant expenses of creation

The refreshing of man-made reasoning needs are utilized Range because of their Complex structure of apparatus, fix and their support.

Making human apathetic

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EDUCREATION
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FORMULATION, EVALUATION AND CHARACTERIZATION OF ATORVASTATIN CALCIUM DISPERSIBLE TABLET

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Abstract
The main objective of the present study reported here was to produce a formulation of dispersible tablet of Atorvastatin calcium which provides rapid dissolution and rapid disintegration as compared to the conventional oral volume type. In order to identify the best formulation different trials has been study for different batches of different formulation methods. Here three methods with different excipients combination has been studied i.e. First method with direct compression, Second method with Dry granulation method and the third method were for wet granulation method was studied. In the first method all the batches of direct compression the disintegration time was found to be more than 1 min. In second method the same problem was found for dissolution and disintegration time was not suitable as the tablet take more time to disperse. Lastly In wet granulation method in which total four batches has been performed with change in excipients amount. In all four batches 1st and 4th trial was compared on dissolution basis study. In both the trials the difference is only with one excipients with MCC 101 in trial F-1 and MCC 102 in F4. On comparison it was found that the F4 trial with excipients MCC 102 showed good dissolution and disintegration behaviour in respect to F1 trial of wet granulation method. The stability performance has been done simultaneously on initial condition and accelerated condition at 40 °C and 75% RH and it was found that the Short-term stability studies on the promising formulation having no significant changes in drug content. Final tablet was optimized on the basis of drug content analysis, disintegration and by dissolution study. The formulation of F4 with the excipients MCC 102 by wet granulation was found to be best in comparison to other batches of different methods formulation.

Key Words:*Dispersible tablets, Atorvastatin, Wet granulation.*

Introduction

The basic aim of every formulation is to provide a safe and effective dosage form. Instead of having so many benefits of conventional dosages form sometimes do not prove useful in certain situation like in case of swallowing, elder patient because of tremors and dysphasia, in condition like nausea the patients who are disabled and mentally ill. The objective behind the present study formulation, development and characterization of Atorvastatin calcium tablet is to provide a fast dissolution and disintegration of drug in short time in order to provide rapid action.

Introduction to Dispersible tablet

Definition is according to European pharmacopeia**: -** They are the uncoated and film-coated tablets intended to be dispersed in water before administration giving a homogeneous dispersion. Oral dispersible tablets (ODTs) are uncoated tablets intended to be placed in the mouth where they disperse rapidly before being swallowed .

The ideal properties of a drug for oral dispersible tablet having:-

- Having the ability to permeate the oral mucosa.
- Ability to diffuse and partition into the epithelium of the upper GIT.
- Due to small size there will be no any moderate in molecular weight.
- Having low dose drug most preferable less than 50 mg.
- Having good stability of drug in water and saliva.

Introduction to drug (Atorvastatin calcium)

These drugs having the structural analogues of HMG – coenzymes A reductase. They work on the principle of inhibiting the rate limiting enzyme (HMG –coenzyme A reductase) in the biosynthesis of cholesterol in the liver. By inhibiting this enzyme, it significantly reduces plasma levels of total cholesterol, Low density lipid and Apo B. It also decreased the plasma triglycerides and a small increase in plasma level of HDL [1].

Another HMG –CoA reductase inhibitors include the diallyl disulphide (DADS) and diallylthiosulfinate. DADS are an organosulphur compound derived from garlic. It reduces the cholesterol synthesis by 10-25% at low concentration. Bis-(3-(4-nitrophenyl) prop-2-ene) disulfide, a new derivative of diallyldisulfide, is effective in reducing plasma total cholesterol [2].

Introduction to Disease Hyperlipidemia is a disease condition in which one or more of the plasma lipids including triglycerides, cholesterol, cholesterol esters and phospholipids and or plasma lipoprotein including very low density lipoprotein and reduced high density lipoprotein levels increase [3,4].

Experimental Method

Preparation Of Tablet By Wet Granulation Method

Weight intragranular part as per the formula. Pass through the sieve number # 40.With the help of Rapid mixer granulator, granulate with polysorbate 80 (1gm) and water (50 gm)**.**After that keep the blend in hot dry oven at 60°C for drying purpose. Check the LOD until it comes to 1 %.Now weight the extra granular part as per the formula. Pass the MCC 102, Acdisol and aerosil through the sieve number # 40 and magnesium stearate through #60.Mix the intragranular part with extra granular part by using the double cone blender. The resulting powder mixture was then compressed into tablets using rotary tablet machine equipped with 6.40 mm round concave punch. Sufficient pressure is applied to keep the hardness 4kg/cm2.

Invitro Drug Release Behaviour Of The Dispersible Tablet By Wet Granulation Method

Buffer

0.05M phosphate buffer prepared as follows. Dissolve 6.8g of monobasic potassium phosphate in 900 mL of water. Adjust with 6 N sodium hydroxide to get a pH of 6.8 and dilute with water to 1L. Medium: Buffer; 900mL Apparatus 2: 75ppm Time: 5, 10, 15, 30 min. Diluent: Acetonitrile and water (50:50).

Standard stock solution

Weigh and transfer about Atorvastatin calcium working standard equivalent to 25 mg Atorvastatin into 25 ml volumetric flask. Add 15 ml diluent and sonicate for 10min or until dissolve. Dilute with diluent to the volume.

Standard solution

For 10 mg: Pipette2 ml of above standard stock solution to 200 ml volumetric flask. Dilute with dissolution media to the volume.

Test Preparation

Drop one tablet in each dissolution vessel and run the dissolution apparatus at specified time at specified rpm. After specified time interval withdraw specified volume and replace it with replenish dissolution medium. Filter through 0.45µm nylon filter.

Calculation Formula

% Atorvastatin dissolved (C 33 H 35 FN 2 O 5

"Equation (1)**"**

$$AT/AS \times WS/DS \times 900/ 1 \times P/100 \times 1/C \times F \times 100$$

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COMPARATIVE STUDY BETWEEN NATURAL SUPER DISINTEGRANT AND SYNTHETIC SUPER DISINTEGRANT IN THE FORMULATION OF IMMEDIATE RELEASE TABLET OF FENOFIBRATE

Amrita Mathur*, Somya Sharma, Shubham Sharma*, Kartik Sharma, Gaurav Bhardwaj, Anuj Pathak*, Abhay Bhardwaj, Daksh Bhatia.

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Abstract

Several dosage forms had been developed so as to release the drug immediately after administration and drug will slowly or incompletely dissolve in gastrointestinal tract. BCS classify, Fenofibrate under Class II (Solubility low and Permeability high). Fenofibrate is a drug used to lower the lipids which is difficult to solubilize in water. It is found that the rate of dissolution and bioavailability is less. Hence, the drug is formulated using different Super disintegrant such as Locust Bean Gum (Natural), Croscarmellose Sodium and Sodium Starch Glycolate (Synthetic) in addition to increase the release rate of drug from dosage so as to raise thesolubility, oral usage rate and dissolution. The evaluation based on physiochemical substances and invitro dissolution examination was operated for the planned granules and tablets. It was observed that using the Locust Bean Gum, immediate release tablets with proper hardness, disintegration time and increased dissolution percentage can be formulated.

Keywords: *Anti- hyperlipidaemic, Croscarmellose Sodium, Locust bean gum, Fenofibrate*

Introduction

The oral way is most prominent and exists as perfect way for curative agent distribution due to small price therapy, construction and calmness of direction leading to upraised patient consent levels. Now appropriate therapeutic situation, many patients desire rapid commencement of action and wherefore immediate release of medication desired. To overpower these advantages, the pharmaceutic dosage form of immediate release has originated as substituted oral dosage forms that immediately disintegrate and dissolve to relief the medicines [1,2]. Immediate relief drug delivery system is based on a single or multiple- unit reservoir or matrix arrangement, describe to deliver immediate levels of drugs in a short time.Dose delivery with immediate release is desirable for drugs with long organic half-life, immense bioavailability, lower approval and lower half-life elimination [3].

Disintegrants are the factorscombined to the tablet and in certain enclosed formulations to stimulate the splitting of tablet and capsule "slugs" into smallerpiece in an aqueous conditionto rise of release of drug material. For disintegrating function,ability to interact strongly with water is crucial. The working of disintegrating activityisfusion of swelling and/or wicking and/or damage [3,4]. Disintegrating agent are required if a rapid event is desired, as in the case of pain recovery or pain relievers. Where the disintegrant starts to lose (part of) its performance during storage, the desired effect can be delayed or not occur at all [5]. Super disintegrant are classified in naturaland synthetic super disintegrant.

Natural superdisintegrants include ispaghula husk mucilage, locust bean gum, agar, alginates and so on.Synthetic superdisintegrants comprised of cross-linked polyvinyl pyrrolidone (Crospovidone, Polyplasdone xl, xl10), microcrystalline cellulose (Avicel), modified cellulose (Croscarmellose Sodium, ac-di-sol), sodium starch glycolate (Explotab, Primogel) [6].There are three approaches of disintegrating into the formulation: intragranular (Inside Addition), extragranular (Extraneous Addition), partly intragranular and extragranular [7-9].Fenofibrate can be classified as a BCS class II drug which haspronounced bioavailability effect on food [10]. Fenofibrate is used primarily to treat primary hypercholesterolemia or mixed dyslipidemia. It works by lowering the levels of low-density lipoprotein (LDL), very low-density lipoprotein (VLDL), and triglycerides and by increasing levels of high-density lipoprotein (HDL) [11-13].Moulding, lyophilisation, or freeze drying, direct compression, spray drying, and sublimation are the highest popular preparation methods.One of the approaches allowing the fusion of a superdisintegrant into the formulation is direct compression [14]. The aim of this paper to examine the comparison of variance super disintegrant and their efficacy in stimulating disintegration and dissolution of active ingredients from Fenofibrate's directly compressed tablets.

Materials *and Methods*

Materials

Fenofibrate was procured fromKIET School of Pharmacy. Microcrystalline Cellulose (MCC), Corn Starch, Croscarmellose Sodium, Sodium Starch Glycolate, Locust Bean Gum, Magnesium Stearate, Talc was obtained from KIET School of Pharmacy.

Preparation of Fenofibrate Immediate Release Tablet Using Direct Compression Method

Fenofibrate, Microcrystalline cellulose (MCC), Corn Starch were mixed in a polybag for 15 min withSuper disintegrant, passed through the 60# sieve. This combination was 5 minutes long kneaded with magnesium stearate and talc and processed as direct compression using 6 mm flat-faced rotary tablet machine punch. For all formulations, compression force was maintained constant. The magnesium stearate level for all formulations was set at 3per cent.

Different Synthetic (Croscarmellose Sodium, Sodium Starch Glycolate) and Natural Super disintegrants (Locust Bean Gum) were used at 5% & 7.5% in tablets.

Table 1: Different Composition of Fenofibrate Immediate Release Tablets

Lot No.	F1 (5%)	F2 (7.5%)	F3 (5%)	F4 7.5%)	F5 (5%)	F6 (7.5%)
Ingredients	Unit Formula (mg per tablet)					
Fenofibrate	40	40	40	40	40	40
Microcrystalline Cellulose (MCC)	130	125	130	125	130	125
Corn Starch	10	10	10	10	10	10
Croscarmellose Sodium (Ac-di-sol)	10	15	-	-	-	-
Sodium Starch Glycolate	-	-	10	15	-	-
Locust Bean Gum	-	-	-	-	10	15
Magnesium	6	6	6	6	6	6

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CURRENT UPDATES ON NANOTECHNOLOGY IN DRUG DELIVERY: A REVIEW

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Abstract

The utmost developing wing in pharmaceutical science is known as 'Pharmaceutical nanotechnology' which presents various new devices, opportunity, extension in the application of disease diagnosis and therapeutics. The potential of nanotherapeutics to provide targeted drug delivery, enhance drug solubility, expand drug half-life, improve a drug's therapeutic index, and reduce a drug's immunogenicity has resulted to revolutionize the treatment of many diseases. One of the most potent nanosystems is nanoemulsion having the droplet size ranging to submicron size. Nanoemulsion (also known as mini emulsion) are clear oil-in-water (O/W) or water-in-oil (W/O) droplets with a mean particle size between 100 and 500nm. The major components of nanoemulsion are oil, water, surfactant and co-surfactant (additionally). The stableness of nanoemulsion formulation can be constant/continuous by a surfactant and co-surfactant. Nanoemulsion has been considered as a promising method due to its advantage such as easy preparation, optical clarity, solubilizing for both hydrophilic and hydrophobic drug, less energy required and an additional advantage of greatly bypass the barrier and improve the drug targeting.

KEYWORDS: *ANN, Characterization, Nanotechnology, Nanoemulsion, Patent, Regulatory aspects, Techniques*

Introduction

Nanomedicine is the practice of nanotechnology to medicine and is vision to have animmense part on public health. It uses nanosized tools for the diagnosis, prevention, and treatment of diseases and enclosevarious definite application areas: drug delivery, drugs and therapies, in vivo imaging, in vitro diagnostics, biomaterials, and active implants. Over the decades, momentous development has been made in the field of nanomedicine, arise in a number of products, including therapeutics and imaging agents, enabling more potent and less toxic therapeutic and diagnostic interventions.[1]

Nanoemulsions are o/w emulsions with a nano-size from 50 to 1000 nm. Generally, the moderate droplet size is between 100 and 500 nm. The particles can prevailO/W or W/O, where the core of the particle is either oil or water, respectively. Nanoemulsion also include the surfactants approved for human consumption and common food substances that are "Generally Recognized as Safe" (GRAS) by the FDA and additionally a co-solvent. These emulsions are easily composed in giant batches by mixing a water-immiscible oil phase with an aqueous phase under high shear stress, or mechanical extrusion process.[2]

The major advantages of nanoemulsion include targeted delivery of drugs,solubilising for both hydrophilic and hydrophobic drugs, competence to protect drugs from degradation with long period stability thus making an ideal drug delivery system. The repetition and dose of injections can be diminished throughout the therapy as the release pattern of drugs takes place in a sustained and controlled mode over long duration.[3]

Nanoemulsion show extreme potential for the future of cosmetics, diagnostics, drug therapies and biotechnologies. Nanoemulsion have applications in distinct fields such as in cancer treatment, in drug targeting, as a mucosal vaccine, as a vehicle for transdermal drug delivery and lipophilic drug as a self-nanoemulsifying and solid self-nanoemulsifying drug delivery system, etc.[4]

Diminishing droplet sizes to the nanoscale induce some interesting physical properties, such as optical transparency and unusual elastic behaviour. Nanoemulsions are part of a vast class of multiphase colloidal dispersions. Despite some lyotropic liquid crystalline phases, also known as "mesophases", and "micro-emulsions", may occur to be related to nanoemulsion in composition and nanoscale structure, such phases are actually quite different.[2]

Nanoemulsion can be accomplished into several dosage forms, like liquid, cream, spray, gel, aerosol, foam and can be administered by variable routes like topical, oral, intravenous(i.v.), nasal, pulmonary, and ocular.[5]

Types of Nanoparticles[6, 7]

There are many types of nanoparticles (NP) with different size, shape, composition and functionalities. The major characteristics and functionalities of each NP are relevant for biomedical research. Some of them are;

Nanoemulsion (NE) has been considered as a promising method due to its advantage such as easy preparation, optical clarity, solubilizing for both hydrophilic and hydrophobic drug, less energy required and an additional advantage of greatly bypass the barrier and improve the drug targeting.

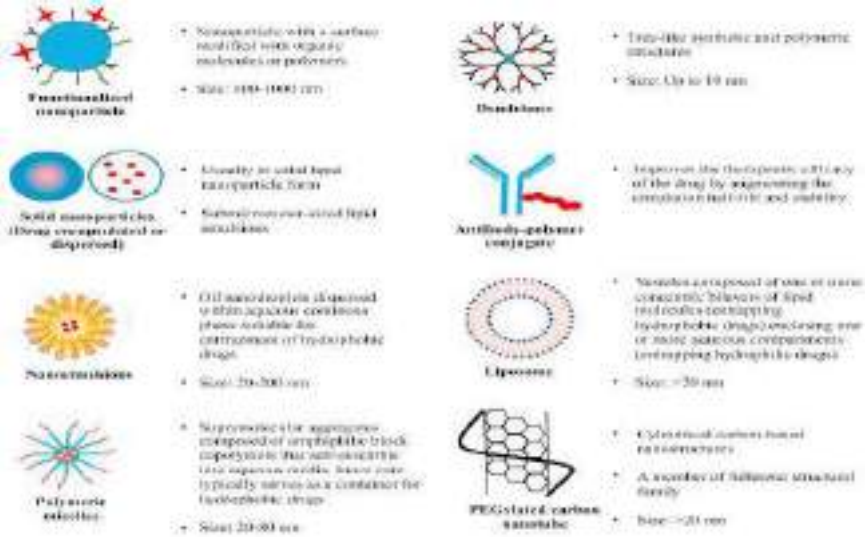

Fig. 1 nanoparticles types

CHAPTER 3.2

Pre-clinical models of Depression: Nehavioral and Molecular Perspective

Ashok Jangra & Ashok Kumar Datusalia

Abstract

Depression is a common, recurring, heterogeneous and potentially lethal psychiatric disorder that affects 350 million people across the globe. Core symptoms of depression include depressed mood, loss of interest, anhedonia, loss of energy, distorted thoughts, self-guilt, irregular patterns of sleep and appetite, and suicidal ideation. Animal models of depression play a crucial role in the screening and development of new antidepressant drugs during preclinical studies. Despite the high prevalence, substantial social and economic burden of depression on human population, its underlying etiology and pathological mechanisms are still not completely explored. Because some unique and multifaceted characteristics of depressive illness such as depressed mood, suicidal tendency are the major obstacles to be modeled in animals. An ideal animal model of depression offers opportunities to understand underlying molecular and genetic pathological mechanisms involved in the depression. Limited efficacy, delayed action and more side effects of the current antidepressant medications warrant a need to develop a novel antidepressant, which will be more efficacious and show a promising approach for the treatment of depression. In the past years, different animal models of depression have been proposed to screen the new pharmacological agents. Out of these, some animal models of depression are pharmacologically sensitive, and can thus utilize in the screening of new antidepressant drugs in rodents. These models are mainly based on actions of known antidepressants or responses to stress or both. The present chapter focuses on

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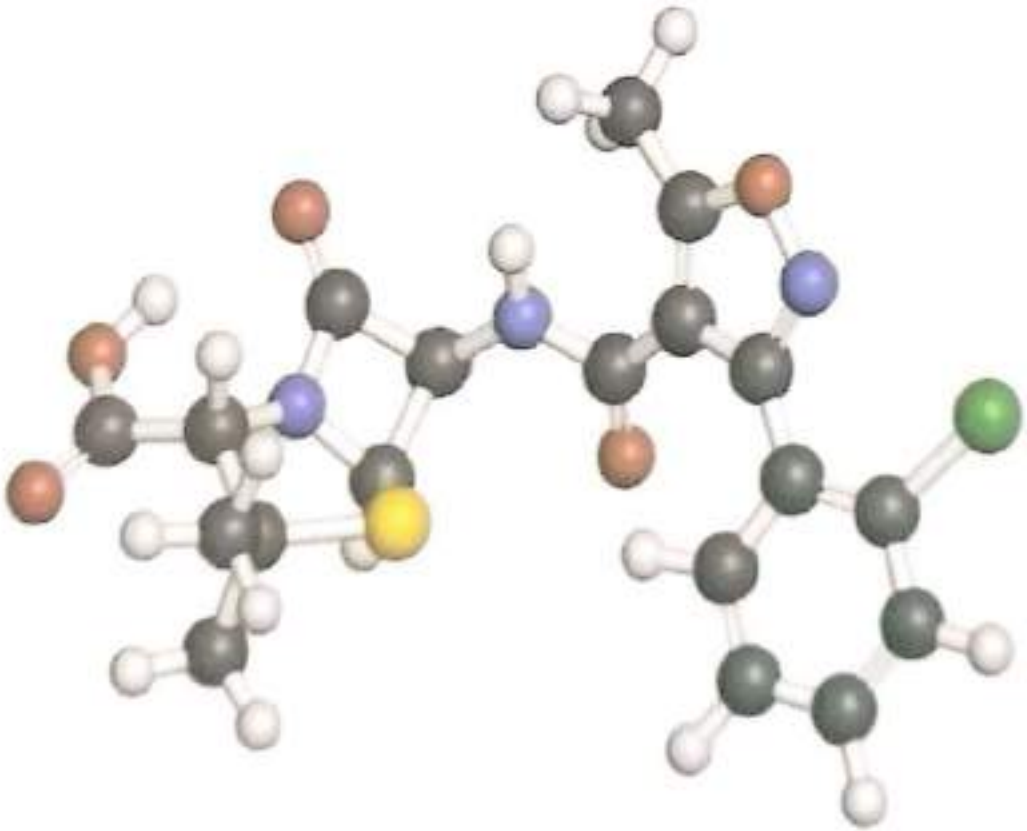

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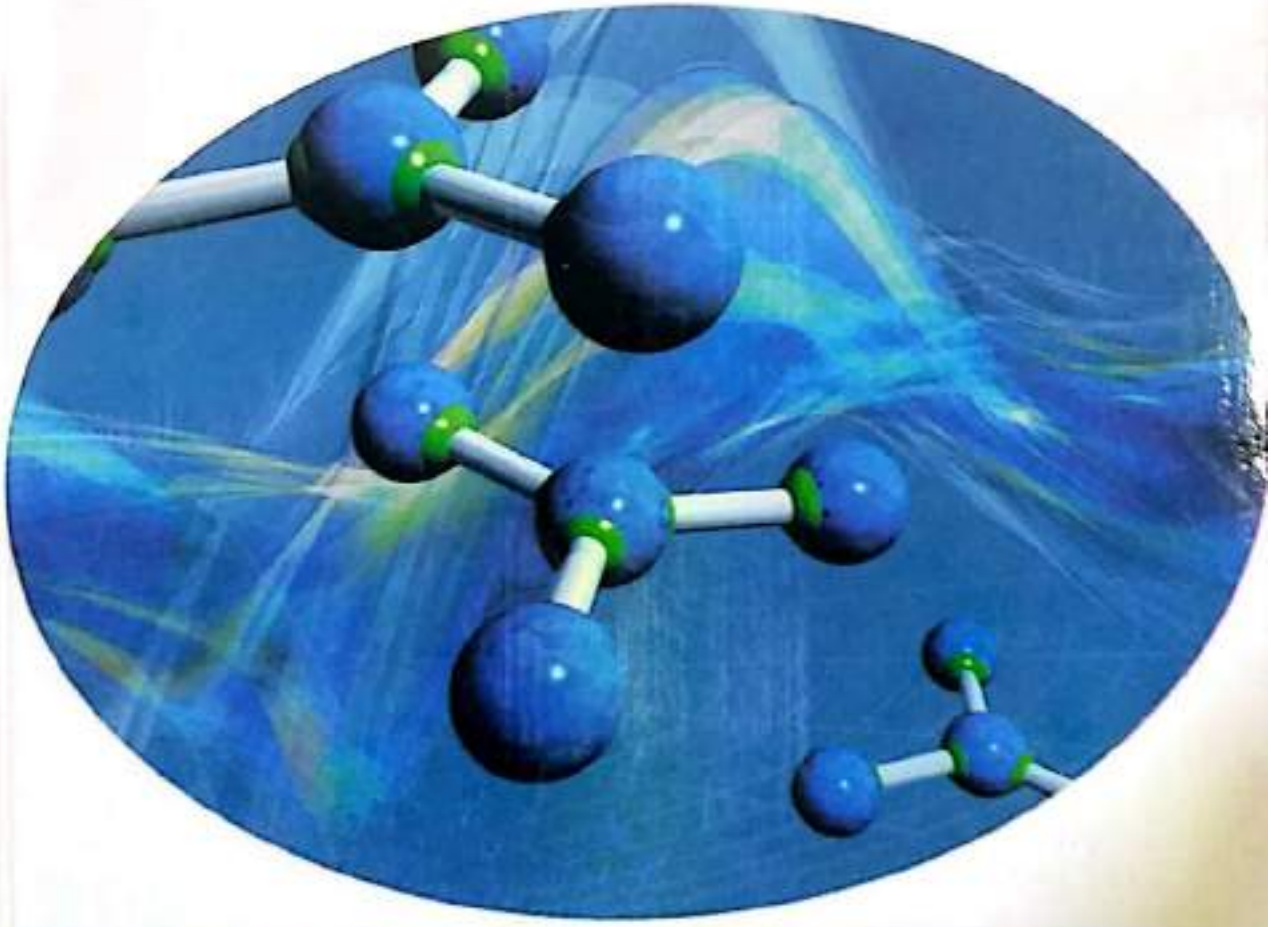

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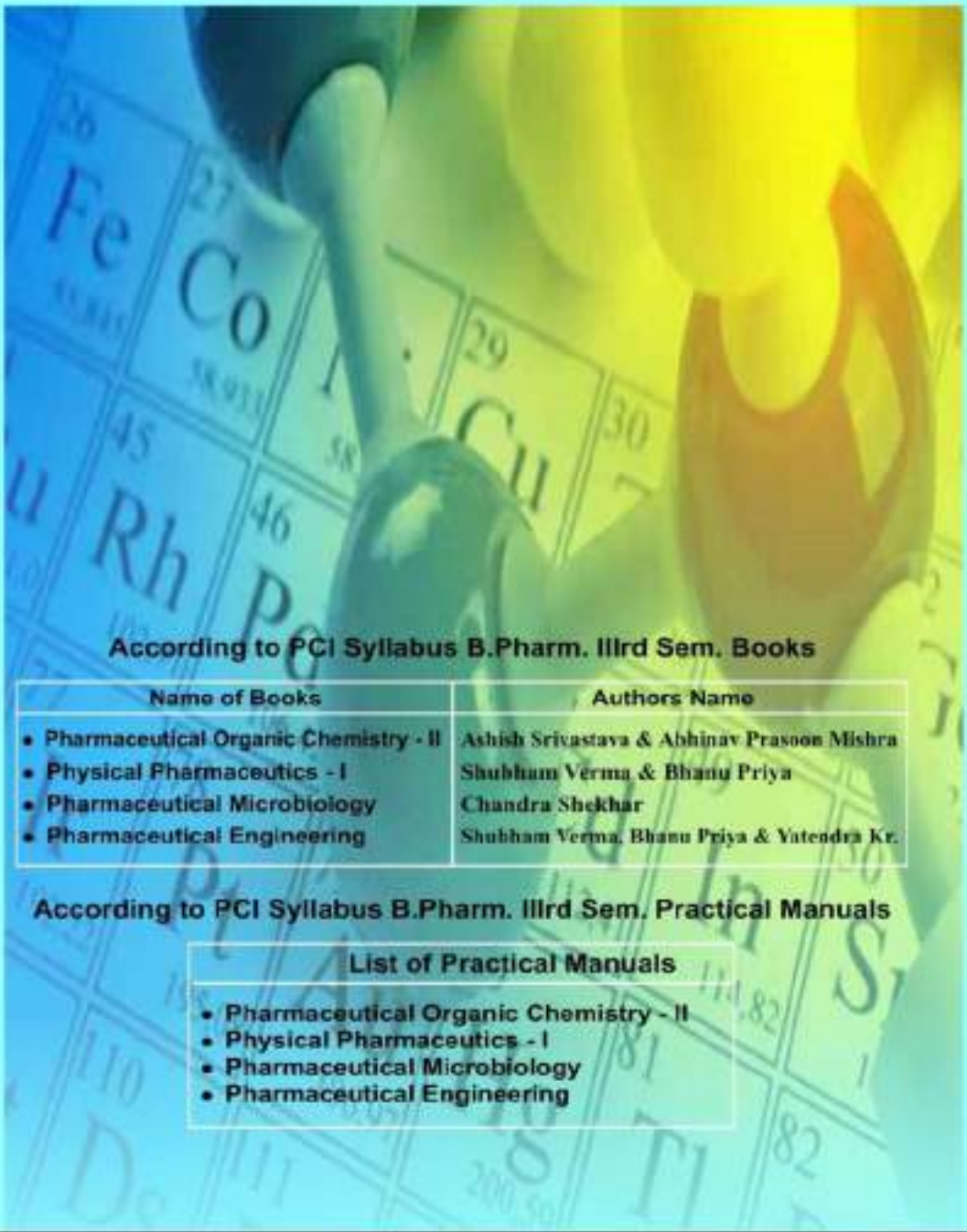

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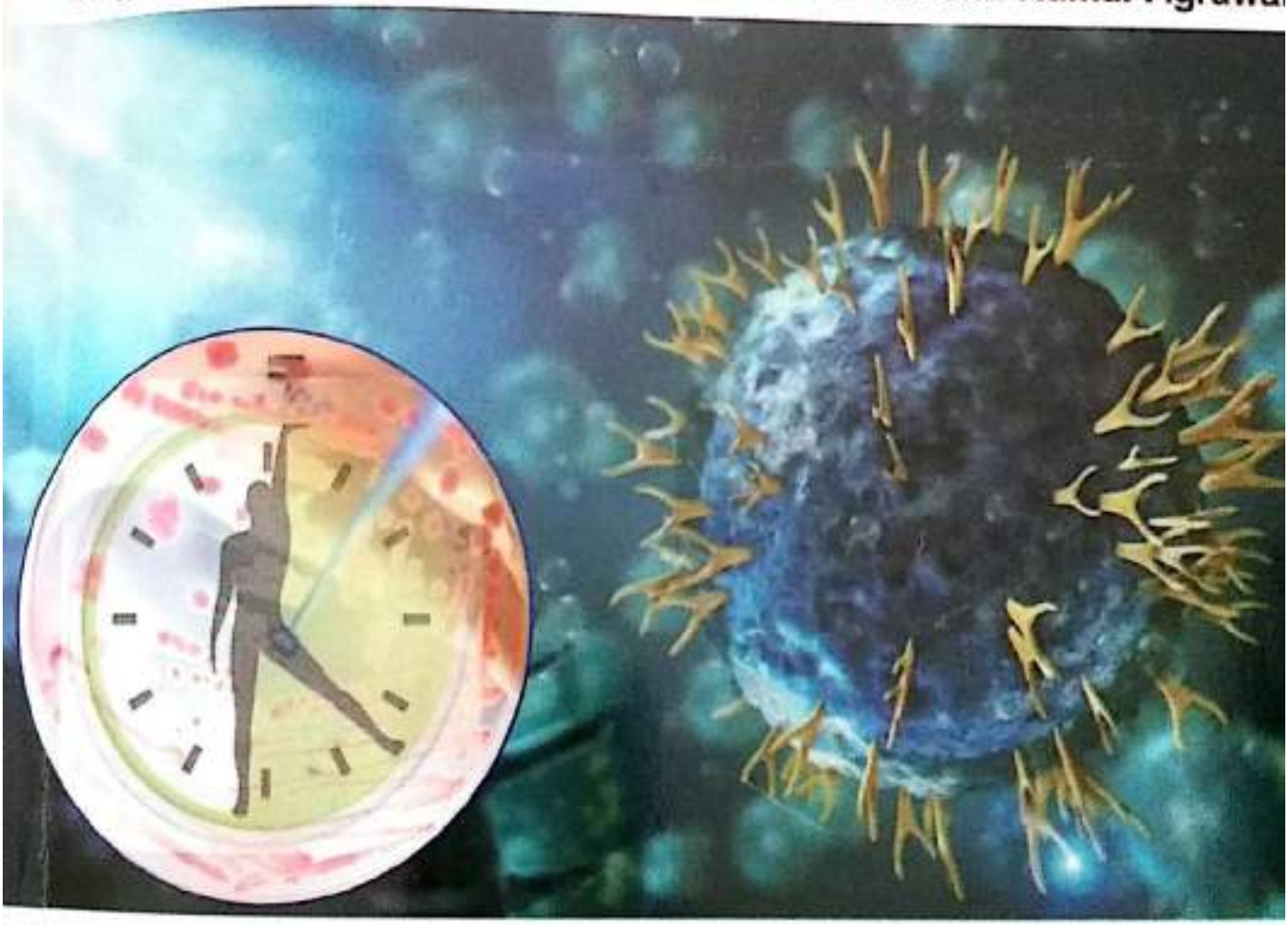

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About the Authors

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Mr. Praveen Kumar Dixit is young, dynamic and competent pharmacy professional working as Assistant Professor in the Department of Pharmacology, KIET School of Pharmacy, Ghaziabad since July 2014. His field of research mainly includes anti-diabetic, anti-inflammatory and anti-arthritic activities. He has guided many post graduate projects. He has authored more than four books of Human Anatomy & Physiology, Remedial Biology and Pharmacology for pharmacy graduates. He has organized many students development programmes, seminars, conferences as joint organizing secretary. He has published more than 28 research and review papers in peer reviewed national and international journals of repute. He has published more than 40 abstracts in various national and international seminars and conferences proceedings. He has participated in more than 35 various National and International Symposia, Seminars, Conferences, Faculty development programmes and Short term Training Courses. He has life time membership of various professional bodies like Association of Pharmaceutical Teachers of India (APTI), Indian Pharmacological Society (IPS) and Indian Pharmacy Graduate Association (IPGA).

Mr. Krishn Kumar Agrawal is presently working as an Assistant Professor in the Department of Pharmacy, Raja Balwant Singh Engineering Technical Campus, Bichpuri, Agra. He has completed his M.Pharm. in Pharmacology from GLA Institute of Pharmaceutical Research, Mathura. He has published fourteen Research papers in National and International Journals of repute. He has presented many research papers in various National and International conferences.

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Preface

This text book of Pharmacology-III is m
students. Pharmacology is a fascinating bra
Pharmacokinetic and pharmacodynamics
described in this book are as per the syllab
of India for undergraduates students. In th
is explained diagrammatically for better
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for medical and para-medical students

We are thankful to publisher **Mr.**
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this book.

Dr. DEEPA

Dr. Deepa is an assistant professor at KIET school of Management. She holds MBA and PhD. She has relevant experience of 12 years in academics and research. She is a life member of 'The Indian Econometric Society'. She has organized various events like Conferences, MDP, Workshops etc. She is the coordinator for academia industry interaction cell and startup-MBA in which students are being promoted to be involved in startups. She is also doing Research Project funded by ICSSR, New Delhi. Her 17 papers have been published in reputed journals, apart these, she has presented 17 papers in international and national conferences. Besides, she has also attended 13 FDPs / Workshops at different level. She has also contributed one book.

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E-Governance in Rurban India

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E-Governance in Rurban India

Dr. DEEPA

Dr. PRATEEK GUPTA

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Dr. PRATEEK GUPTA

Dr. Prateek Gupta is presently an associate professor at the School of Management, KIET Group of Institutions, Delhi-NCR. He is an MBA, M.Com, PGDIBO, UGC-NET (Commerce), UGC-NET (Mgmt), and Ph.D. with significant experience of 18 years in academics and research. He has completed four (04) sponsored research projects funded by reputed organizations like ICSSR, IIPA, New Delhi etc., also received a funded consultancy. He has contributed 51 papers in reputed journals and presented 41 papers in international and national conferences. He has 3 books, 2 monographs and 2 copyrights under his credits. He has also attended 30 FDPs / Workshops at a different level. He is an approved supervisor of AKTU, Lucknow, and guiding 4 research scholars for Ph.D. at present. He has organized various events like Seminars, Conference, MDP, Workshops, etc successfully. He is a life member of 'The Indian Econometric Society' and Indian Commerce Association. He is also a Recognized National Level Hindi Poet.

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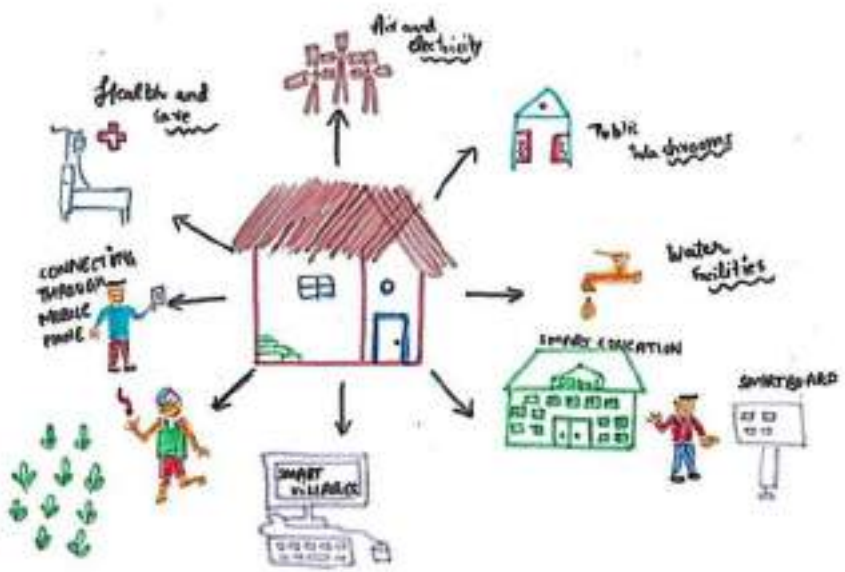
DR. PRATEEK GUPTA, DR. DEEPA

Making Villages SMART through ATRMS



Dr. PRATEEK GUPTA

Dr. DEEPA

MARKETING MANAGEMENT

Dr. Amit Tyagi
Dr. Ranchay Bhateja
Dr. Mani Tyagi

ABOUT THE BOOK

The book is designed to meet the requirements of management students at the graduate and p graduate levels. It presents concepts that are clearly explained through live examples managerial applications. Students of other degrees such as BBA, B.Com, MBA, PGDM, ICWA, CS etc will also find this book very useful and relevant.

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KEY FEATURES OF THE BOOK

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- Live examples from both Indian and International market environment.
- Use of tables, figures and pictures for better understanding
- Concise and precise presentation of the text
- Short and long answer type and applied questions at the end of each chapter.

ABOUT THE AUTHORS

Dr. Amit Tyagi consistently having a brilliant academic career with more th years of rich experience in academics and research. Presently he is worki Associate Professor in Centre for Management Development, Modinagar an been on their board of studies for strategic decision making. He continues to post graduate students of marketing He has also been extensively invol conducting management programs on Marketing and Consumer behaviou research interests have been marketing and he has published papers in v Journals. He participated in many National & International Conferenc xperience in Marketing Management area covered hands on experience in practically all f marketing management from conceptualization, consumer behaviour, digital marketi arketing communications.

Dr. Ranchay Bhateja, an eminent professional author, teacher and traine education system. She had illustrious career for more than two decades. S excelled herself in institute as a teacher, an administrator and an inst builder. She is presently working as an Associate Professor and Coor Carrier guidance Cell with KIET Group of Institutions and associated wit management institutes as a visiting professor. She has written many artic papers in journals. She has a considerable amount of experience in te writing in various management disciplines.

Dr. Mani Tyagi, she is Associate Professor and Associate Dean Student's in KIET Group of Institutions Ghaziabad. She holds a doctorate de Commerce and Masters Degree in Business Management. She has been t students of management and training executives from more than 15 years. presented several papers in national and international conferences, also pu papers in many reputed journals. In addition to pursuing her academic li Dr. Mani is active in management consulting as well as execut organizational development.

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Internet of Everything (IoE): Security and Privacy Paradigm

PRIVACY VULNERABILITIES AND DATA SECURITY CHALLENGES IN THE IoT

Edited by
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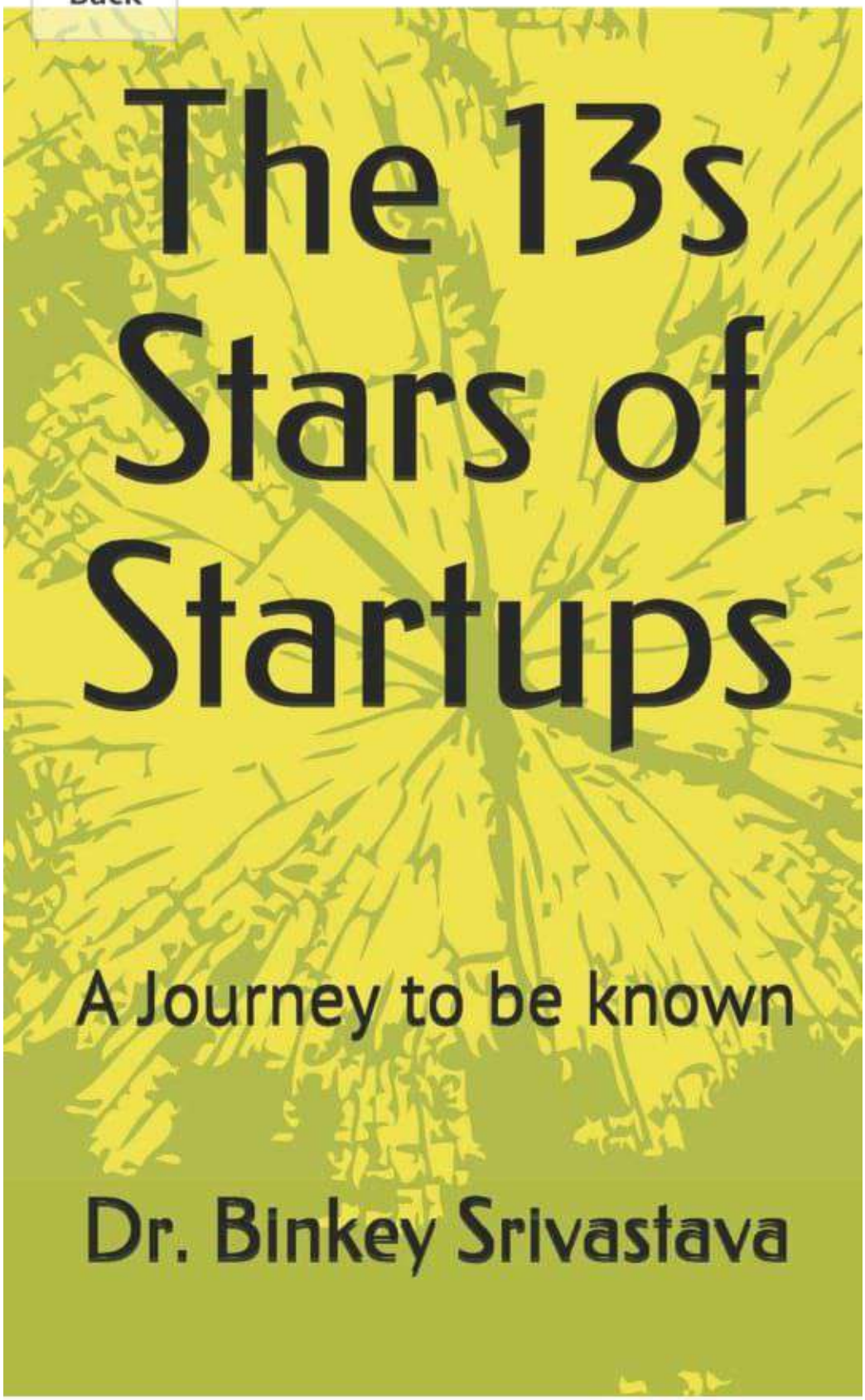
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Contents

Volume 1

Chapter

XBee and Internet of Robotic Things Based Worker Safety in Construction Sites

By Rajesh Singh, Anita Gehlot, Divyanshu Gupta, Geeta Rana, Ravindra Sharma, Shivani Agarwal

Book Handbook of IoT and Big Data (https://www.taylorfrancis.com/books/mono/10.1201/9780429053290/handbook-iot-big-data?refId=5bc10d65-fb9f-46dd-b223-d30d82c8e74a)

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Next Chapter (chapters/edit/10.1201/9780429053290-5/contribution-iot-big-data-modern-health-care-applications-smart-city-mamata-rath-vijender-kumar-solanki)

THE STANCES OF e-GOVERNMENT

POLICIES, PROCESSES AND TECHNOLOGIES

Edited by
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8

Appraising the Societal Approach of India through the Social Cost Benefit Matrix

Deepa and Prateek Gupta

CONTENTS

8.1 Introduction

Capacity building is required within government and the creation of general awareness about e-governance among citizens. The consequent benefits can be a reduction in corruption, enhanced transparency, better convenience, growth in revenue, and/or cost reduction. Hence, e-governance has gained more popularity in the complex business world. e-Governance allows citizens to communicate with the government, participate in the government's policy making, and to communicate with each other. e-Governance creates opportunities for the government to revolutionize the procedure of the creation and execution of a sustainable approach from a system-focused to an actor-driven one.

Identifying the increasing use of electronics, the Government of India established the Department of Electronics in 1970. By the 1980s, a large number of government officers had computers but they were typically used for "word processing." The escalation of e-governance first stared with the National Informatics Centre (NIC) being established in 1977, and it was a first important footstep on the road to e-governance in India. The establishment of NICNET in 1987 was the major pushing force for e-governance. The National e-Governance Plan (NeGP) commenced in 2006, which showed a striking agenda for embryonic e-government services. "eKranti" or NeGP 2.0 was also gestated with a spotlight on electronically driven services. Later, Digital India, which commenced on July 1, 2015, became

A Decentralized Way to Store and Authenticate Educational Documents on Private Blockchain

Publisher: IEEE

Ajay Kumar Shrivastava ; Chetan Vashistth ; Akash Rajak ; Arun Kumar Tripathi **All Authors**

Abstract:A decentralized private Blockchain implementation for academic document storage and document verification can add self-sovereignty to the process. It can dramatically min... **View more**

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Abstract:
A decentralized private Blockchain implementation for academic document storage and document verification can add self-sovereignty to the process. It can dramatically minimize the time and cost of verification at various layers of verification. Blockchain would remove all the layers at all and it will provide immediate auditing of any document. So, the request and response will be truly real time in our case.Apart from speeding up the verification process, it will also increase the security of personal education data and will check all kind of misuse also. Putting documents on Blockchain would increase the security, because all the data would only be accessible by private key and proper authentication to that private key.We are proposing a private Blockchain that would be managed by some private vendors and only those vendors will take part in consensus. So, we are using proof of stake consensus in our case. We are using private IPFS database server for storing our documents over Blockchain. We are considering Ethereum Blockchain ecosystem in our case. Alternatively we can also use Hyperledger Fabric for implementation but that discussion is out of the scope for current document.

Published in: 2019 International Conference on Issues and Challenges in Intelligent Computing Techniques (ICICT)

A smart System for Fake News Detection Using Machine Learning

Publisher: IEEE

Anjali Jain ; Avinash Shakya ; Harsh Khatter ; Amit Kumar Gupta All Authors

Abstract: Most of the smart phone users prefer to read the news via social media over internet. The news websites are publishing the news and provide the source of authentication. ... **View more**

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Abstract:
Most of the smart phone users prefer to read the news via social media over internet. The news websites are publishing the news and provide the source of authentication. The question is how to authenticate the news and articles which are circulated among social media like WhatsApp groups, Facebook Pages, Twitter and other micro blogs & social networking sites. It is harmful for the society to believe on the rumors and pretend to be a news. The need of an hour is to stop the rumors especially in the developing countries like India, and focus on the correct, authenticated news articles. This paper demonstrates a model and the methodology for fake news detection. With the help of Machine learning and natural language processing, author tried to aggregate the news and later determine whether the news is real or fake using Support Vector Machine. The results of the proposed model is compared with existing models. The proposed model is working well and defining the correctness of results upto 93.6% of accuracy.

Published in: 2019 International Conference on Issues and Challenges in Intelligent Computing Techniques (ICICT)

Date of Conference: 27-28 Sept. 2019 **INSPEC Accession Number:** 19319352

Date Added to IEEE *Xplore*: 03 February 2020 **DOI:** 10.1109/ICICT46931.2019.8977659

Conferences > 2019 International Conference...

A Survey on Quantum Key Distribution

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Abhishek Sharma ; Amit Kumar **All Authors**

Abstract: Quantum key distribution is a catchword among industry specialist now a day.It is arising an alarming situation to all the current network security techniques. These are ... **View more**

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Abstract:

Quantum key distribution is a catchword among industry specialist now a day.It is arising an alarming situation to all the current network security techniques. These are the basic properties of Quantum Mechanics, which makes a combination with network security. At present there are so many companies out there in market which are making progress it this fields day by day.Quantum cryptography is a very important technology now days as it is helping a lot to secure the future network communication. This particular field has gained the attention from industry as well as from academics. Here we are writing this paper to provide the general review of various fields belongs to Quantum Computing, but our main aim is to provide a brief review and analysis of recent development in the field of Quantum Key Distribution, most famous and developed field of Quantum Computing. This paper presents review of Quantum Computing including different application fields like Quantum public key cryptography, QKD, Quantum Authentication. First we discuss the basics of Quantum Cryptography then we discuss the definition of Quantum key Distribution, Various protocols of this field. Then after we discuss the opportunities in this field.

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Date of Conference: 27-28 Sept. 2019 **INSPEC Accession Number:** 19304677

Business Service Management using Blockchain

Publisher: IEEE

Arun Kumar Tripathi ; Apoorv Jain ; Naresh Chandra ; Akash Rajak ; Ajay Kumar Shrivastava **All Authors**

Abstract: Blockchain is one of emerging research area and gaining attention due to its wide range of applications. Smart contracts are one of the latest application areas of blockc... **View more**

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Abstract:
Blockchain is one of emerging research area and gaining attention due to its wide range of applications. Smart contracts are one of the latest application areas of blockchain, which enables secure, transparent and tamperproof transactions. Smart contracts create and verify the data with the help of hash functions. Hash functions are mathematical algorithms that take input and produces hashed output of specified length. It is very difficult to regenerate the original input from the hashed output. Ethereum is one of the leading blockchain platforms to provide functionality of smart contracts. This paper carries out study of blockchain on Ethereum platform. We have developed authentication-based business application with the help of smart contract for marketing services on Ethereum platform. Solidity is used to generate and manage smart contract.

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Publisher: IEEE

Conference Location: Ghaziabad, India

Challenges and Issues in Data Analytics

Publisher: IEEE

Amit Kr. Gupta ; Saurabh Singhal ; Ruchi Rani Garg All Authors

Abstract: Latest advancements in the field of Digital Technologies like Cloud Computing & Internet of Things continuously generating very large amount of data due to the implementa... **View more**

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Abstract:
Latest advancements in the field of Digital Technologies like Cloud Computing & Internet of Things continuously generating very large amount of data due to the implementation of newly invented information systems. Lots of efforts are required for extraction and analysis of this huge amount of data in order to make effective, efficient and accurate decision making. Thus, analysis in the field of big data created a very wide domain for research and development. In this paper, our objective is to get aware about impact of big data challenges, issues and tools deployed. By this paper we try to generate a platform for exploration of big data at several stages. Besides this it also led out certain issues which encourage researchers to provide solutions against the issues and challenges.

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Date of Conference: 24-26 Nov. 2018

Date Added to IEEE *Xplore*: 02 September 2019

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DOI: 10.1109/CSNT.2018.8820251

Publisher: IEEE

Conference Location: Bhopal, India

Enhanced Energy Efficient Air Indexing Technique for Data Broadcasting on Wireless Channel

Publisher: IEEE

Prachi Goyal ; Vikas Goel ; Amit Kumar Gupta **All Authors**

Abstract: Data Broadcasting on wireless channel is the research area where many research has been done and are still going on. Earlier data is broadcasted on single channel but now... **View more**

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Abstract:
Data Broadcasting on wireless channel is the research area where many research has been done and are still going on. Earlier data is broadcasted on single channel but now multiple channels are introduced for data broadcasting. In this paper, we propose a hash based indexing method for multiple wireless data broadcast channels. Hashing indexing technique on multiple channels gives better result than on single channel. In this paper, we are proposing an enhanced hashing technique that improves the result of previous proposed broadcasting technique. In this paper, we are taking the advantage of the best features of hashing technique and proposing enhanced hashing technique for multiple channels. Our proposed technique also minimizes collision in hashing technique. The proposed hashing technique aims to address the problem of data broadcasting on wireless channels. The proposed algorithms broadcast the data items to significantly reduce access latency and parameter adjustment time to save time and reduce power consumption of the mobile devices.

Published in: 2019 11th International Conference on Computational Intelligence and Communication Networks (CICN)

Date of Conference: 3-4 Jan. 2019 **DOI:** 10.1109/CICN.2019.8902415

Publisher: IEEE

Conferences > 2018 7th International Confer...

Low Cost Herbal Mosquito Repellent Using Arm Based Device

Publisher: IEEE

Prabhjyot Singh Sodhi ; Neelam Rawat ; Utkarsh Saxena **All Authors**

Abstract: The present study reports the studies directed towards the development of safe and efficient herbal mosquito repellant formulations obtained by mixing a solutions of 20ml... **View more**

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Abstract:
The present study reports the studies directed towards the development of safe and efficient herbal mosquito repellant formulations obtained by mixing a solutions of 20ml Neem extract, 20ml Tulsi Oil, 20ml Turmeric Oil, 20ml Orange Peel Oil, 20gm Clove. This unique solution is composed of herbal components and thus has no side effects on the human beings. This paper also defines a unique mosquito repellant sensor which is base don the density of mosquito in a given area. This paper describes a unique approach through which this sensor automatically sense the mosquito density and then regulate the quantity of fumes of our unique solution which is specially prepared from the herbal components, in order to repel mosquitoes as well as purify the air. We conducted several tests on different compositions and mosquito density and thus we conclude that our approach is better and unique than other existing mosquito repellants available in the market.

Published in: 2018 7th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)

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ISBN Information: **Publisher:** IEEE

Security Attacks, Requirements and Authentication Schemes in VANET

Amit Kumar Goyal ; Arun Kumar Tripathi ; Gaurav Agarwal All Authors

Abstract: Vehicular Ad-hoc Networks (VANET), the promising technique, is getting attention for managing the traffic efficiently and making the road safe. The topographies and its v... **View more**

Metadata

Abstract:
Vehicular Ad-hoc Networks (VANET), the promising technique, is getting attention for managing the traffic efficiently and making the road safe. The topographies and its vast applications varying from road safety, to the traffic management, payment service to infotainment. VANETs are characterized as a self-organized, distributed, highly mobile, dynamic topology, unconstrained power, computational and storage networks. The communication in VANET is performed in open-access environment which demands the security issues must be deal with utter importance. Security requirements includes authentication, availability, message confidentiality, message integrity, data availability, access control, privacy, message non-repudiation and real time guarantees of message delivery. In order to have a secure and efficient VANET infrastructure, an extensive overview of characteristics, challenges, security attacks and requirements must be dealt with. The prime objective of this paper is to provide a classification of security requirements, security characteristics and challenges.

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DOI: 10.1109/ICICT46931.2019.8977656

Sentiment Analysis of Multilingual Twitter Data using Natural Language Processing

Publisher: IEEE

Vikas Goel ; Amit Kr. Gupta ; Narendra Kumar **All Authors**

Abstract: The feelings of WEB users have a great influence on rest of the users, product sellers and market analysis. It is necessary to well structure the unstructured data from v... **View more**

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Abstract:
The feelings of WEB users have a great influence on rest of the users, product sellers and market analysis. It is necessary to well structure the unstructured data from various social platforms for proper and meaningful analyses. For the classification of multilingual data, the analysis of feelings has recognized significant attention. This is called textual organization that may be used to classify state of mind or feelings expressed in different ways like: negative, positive, favorable, unfavorable, thumbs up, thumbs down, etc. in the field of Automatic Language Processing (NLP). To solve this kind of problem, sentiment analysis and deep learning techniques are two merging techniques. Because of machine learning ability, deep learning models are effectively used for this purpose. Recurrent Neural Networks (RNN) and Naive Bayes algorithm are two popular deep learning architectures to analyze feelings in sentences. These architectures may be used in natural language processing. In this research article, we propose solutions to multilingual sentiment analysis problem by implementing algorithms and in order to contract the result, we compare precision factor to find the best solution for multilingual sentimental analysis.

Published in: 2018 8th International Conference on Communication Systems and Network Technologies (CSNT)

Web based Accounting Integrated Management System (AIMS) over Cloud using Mean Stack

Publisher: IEEE

Akhil Kulshreshta ; Neelam Rawat ; Krati Saxena ; Prashant Agrawal **All Authors**

Abstract: This paper says how powerful a cloud based accounting management tool can be, which also provides platform independent services. This paper also observes the tools of MEA... **View more**

Metadata

Abstract:
This paper says how powerful a cloud based accounting management tool can be, which also provides platform independent services. This paper also observes the tools of MEAN stack (MongoDB, Express.js, Angular.js, Node.js) together with Material design. It also takes readers to the libraries like Bcryptjs, Body parser, Cors, JWT.

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HYBRID NON-DESTRUCTIVE TECHNIQUE OF SURFACE & SUBSURFACE FLAWS

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***Abstract*— In Non-Destructive Testing, when dye penetration inspections are done, to rectify the flaws. The dye is applied to the whole part or body so that it can fill up the cracks, defect, etc. In this way, the process becomes uneconomical,complex and tedious. So, idea is to incorporate, the ultrasonic sensor with rotational motion on the borescope tube, so that it can identify the defects in the bulk of the body. As it increases the capability of a borescope to do both surface and subsurface inspectionsimultaneously. This gives the opportunity to identify the definite surface beneath the surface the flaws or defects is encountered. Thus, a dye can be applied to the particularly found surface beneath which flaws arecountered.**

I. INTRODUCTION (*HEADING 1*)

Non-destructive testing (NDT)[10] is a testingtechnique used by industry to inspect the properties of a material, component, structure or system fordefects and discontinuities without causing damage to the object. NDT is also known as non-destructive examination (NDE), Non-destructive inspection (NDI) and non-destructive evaluation (NDE).

A. Non-Destructive Testing Methods [10]-

- Surface Inspection Methods
- Subsurface(bulk) Inspection Methods
- Visual-Optical Inspection
- Liquid-Penetration Inspection (LPI)
- Magnetic Particle Inspection (MPI)
- Ultrasonic Testing (UT)
- Radiographic Testing (RT)
- Eddy Current Testing (ET)
- Acoustic Emission Testing

B. Applications-

NDT has a wide range of applications, in industries where a defect in a component would cause significant hazard or economic loss, such as in transportation, pressure vessels, building structures, piping, and hoisting equipment.[10]

Relation to medical procedures-

Several NDT methods are related to clinical procedures, such as radiography, ultrasonic testing, and visual testing. Technological improvements or upgrades in these NDT methods have advanced over the years.[10]

Fig. 1. Chest radiography.[1]

C. Borescope-

A borescope is an optical tool used to view areas that would otherwise not be visible. A borescope is inserted into the item being evaluated without destroying the item of interest[11].

D. Why Borescope-

The borescope is used when flaws, defects cannot be visualized by naked eye i.e. Visual optical Method which also includes visual aides(magnifying glass, light microscope)

Springer Link

Comparative Investigation of Process Capability of Surface Finish in Milling of EN19 Steel Using VMC

Recent Advances in Mechanical Engineering pp 707-712 | Cite as

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Conference paper
First Online: 29 December 2020

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

In this research investigation, input parameters—cutting speed (CS), feed rate (f) and depth of cut (doc)—were selected for process capability evaluation in milling process using CNC VMC. The process capability index of surface finish was calculated using two types of tools (titanium nitride coated carbide tool and solid carbide tool) during CNC milling operation of EN 19 alloy steel. The optimal process parametric setting was evaluated using single response optimization through Taguchi's robust design. The single response optimization was done for process capability index so that manufactured component could not fall beyond the criteria set for surface finish by customer in case of using both tools. Confirmatory experiments were conducted finally to validate the results.

Keywords

CNC vertical machining center Taguchi's DOE Process Capability index

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CrossRef (https://doi.org/10.1186/2251-712X-9-37)

Chapter PDF Available

Effect of Iron Content and Machining Parameters on Surface Roughness of Al–1V–1Si Alloys

January 2021
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In book: Recent Advances in Mechanical Engineering (pp.261-268)

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References (12) Figures (3)

Abstract and Figures

Surface quality is one of the essential parameters which influence the machinability as well as service life of the component. To improve properties of aluminium alloys, some alloying elements are added which also have a pronounced effect on machinability. The present examination concerns the experimental investigation of machinability of Al-alloys regarding surface quality of machined specimen. Subsequently, the aim of this examination is to analyse the effect of Fe content and machining parameters on machining characteristics in terms of surface quality of Al–(1–4) Fe–1Si–1V cast alloys. It has been observed from the result of examination that the surface quality increases as feed rate decreases and increasing on cutting speed of Al–(1–4)Fe–1V–1Si alloys. The surface quality is affected minimum with feed rate than cutting speed and maximum by depth of cut. Surface roughness increases on increasing amount of iron from 1 to 4% in all the machining conditions. Therefore, it was observed that machinability of alloys is directly related to the compositional changes and its machining parameters.

Microstructures of a Al-1Fe-1… Microstructures of a Al-3Fe-3… Alloys designation…

Figures - uploaded by Arunesh Chandra Author content

Effect of Iron Content and Machining Parameters on Surface Roughness of Al–1V–1Si Alloys

Bibeka Nand Pathak and Arunesh Chandra

1 Introduction

Machinability is one of the major criteria for the selection of material for different applications. The simplicity with which a metal can be machined is an important variables influencing the utility, quality and cost of the item. On the basis of application, machinability is considered in terms of a tool wear rate, tool power consumption and surface quality. There are many ways that can be judged by the machinability of materials depending on the tool material, work material and machining operation for comparison purposes. The main criteria adopted for machinability assessment of the material are tool life, tool wear rate, cutting power and surface roughness created at the workpiece [1, 2]. Generally, it is related to the machining cost of production engineer, and they are serving to the actual behaviour of the material during machining [3].

Properties of the aluminium alloys can improve by addition of some alloying elements which also affect the machinability. Among all the alloying elements, silicon is mostly used and improves the fluidity and castability of Al alloys. Small amount of silicon (<0.8%) addition improves machinability but when silicon percentage is higher, it forms hard silicon particles which is quite abrasive to the tool [4]. Minimum 80 BHN (Brinell hardness number) hardness is required for good machinability; however, hardness is not the only judgement criteria for machinability. If there are higher content of iron in an Al–12Si–Cu–Mg alloy, then it results greater amount of coarser structure than lower content of iron alloy [5]. Modification of the internal structure with addition of alloying elements, selection of process, or subsequent

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Effect of Ni-20 mg treatment and machining parameters on surface quality of Al (1–4) Fe-IV-1Si alloys

Bibeka Nand Pathak [a], Pankul Goel [a], Arunesh Chandra [b]

https://doi.org/10.1016/j.matpr.2019.12.062

Abstract

In this study, the machinability of Al-alloys regarding surface quality of machined specimen was investigated. Subsequently, the impact of Ni-20Mg treatment and machining parameters was analysed on machining characteristics in terms of surface quality of Al-(1–4) Fe-1Si-1V cast alloys. It is observed that Surface roughness (SR) increases with increasing amount of iron (Fe) from 1% to 4% by weight in all the machining parameters. It is also observed that in modified Al-Fe-Si-V alloys, SR increases for all cutting conditions when Fe content is increased from 1% to 2%. At 3% Fe, there is mixed mode of SR height at different cutting conditions, while surface quality significantly improves with modified Al alloys at 4% Fe during all the machining parameters. Therefore, machinability significantly relies on the compositional changes of alloys and modification treatment.

Keywords

Aluminium alloys; Ni-20Mg treatment; Surface roughness (SR); Machinability; Microstructure

Special issue articles Recommended articles Citing articles (1)

Chapter Full-text available

Exploration on Wear Characteristics: Performance of Gears of Polyamide66

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DOI: 10.1007/978-981-15-8704-7_71
In book: Recent Advances in Mechanical Engineering

Shashank Singh · Yogesh Kumar Yadav · Siddhartha Vashishtha · Arunesh Chandra

Abstract and figures

Gears of polymers are extensively preferred in low loads beyond metal gears on account of their ingrained properties like lightweight, lowly noise, self-lubrication and so on. Since, polymer gears are associated with the number of limitations like their use up to a very limited torques and lesser sustainability towards higher temperatures; these gears have the scope of important exploring research topics. For the use of polymers in gearing applications, investigators are exploring materials of high-strength and high-temperature resistance. The present work exhibits the use of Polyamide66 polymer with glass fibre reinforcement for making gears. It was, therefore, using injection moulding three categories of Polyamide66 gears were fabricated. These gears are designated as NPA66G, H15PA66G and H30PA66G having glass fibre contents by weight as 0, 15 and 30% one by one. The different gear pairs and the different torque levels were applied and the specific wear rates of driver as well as driven gears were determined. Accordingly, the polymer gear test rig was used and the experiments were carried out. The guidelines were applied for the design of experiment and accordingly factorial method is enforced. Through ANOVA, the results of experiments were investigated. The different gear pairs were also investigated analytically. The morphology was studied of the polymer gears, the most and the least touched. This was established that the polymer gears having higher fibre contents had the least

Exploration on Wear Characteristics: Performance of Gears of Polyamide66

Shashank Singh, Yogesh Kumar Yadav, Siddhartha, and Arun

1 Introduction

Since 1950s, polymer gears are preferred in many low load applicat
have some inherent properties such as noiseless operations, light
self-lubrication and so on. After proliferation in manufacturing
gears are being used in many essential practices such as food proc
ATM machines, wiper devices in automobiles, copier machines
Previously, plastic gears were used only for below ¼-hp drives due t
properties and uncertainties in their behaviour under varied envi
tions such as temperature and moisture [ ]. Nowadays, research p
moulding controls encompassing environmental factors have boost
drive power to ¾ hp [ ]. Plastic gears might be failed under differ
failure modes are wearing, pitting and cracking at root circle as well
Wearing is defined as material removal from a surface and its def
interaction with any mechanical act in counter directions. Many
have found the occurrences of thermal failure in the plastic gears g
generation of heat at the surface, which is due to the friction and mat
This has been seen that wear rate grows with rise in temperature [

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Highly Productive Solar Stills for Efficient Water Utilization in Agriculture

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First Online: 29 December 2020

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

Due to the expansion of industrialization, the problems of water scarcity and the reduction of arable land due to soil contamination are rising. Solar stills are effective devices for the production of clean water through contaminated or impure water. This paper discusses the usage of wastewater from irrigation as feed water for solar stills. This method will increase water intake efficiency in irrigation. The low productivity of conventional solar stills could be enhanced by the utilization of nanoparticle-enhanced phase change materials. Integration of both these approaches will enhance the effectiveness of the process and will save a significant amount of water.

Keywords

Solar still Agriculture Phase change materials Nanoparticle

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Investigation of Variation in Stress Concentration Factor with the Change in Orientation of Central Hole on a Rectangular Plate

Recent Advances in Mechanical Engineering pp 629-635 | Cite as

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Conference paper
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Abstract

The purpose of this study is to analyze the variation in stress concentration factor with the change in orientation of a central hole on a rectangular plate of specified dimensions, subject to uniaxial loading. The study is carried out using finite element analysis under static structural module on ANSYS software (version 14.5). To distillate effects of stress concentration, flat plates of structural steel having hole orientation at 30°, 45°, and 90° from longitudinal axis were used, and the uniaxial load is varied from 5000 to 20,000 N. After complete investigation of the flat structural steel plates on the software, results show that the value of stress concentration factor reduces by 17.2%, whereas the total deformation increases by 0.46% at 45° in comparison with the plate having vertical hole. All the values of stress concentration factors were analyzed, and it is found that it increases by 8.17% from 30° to 90° variation of hole inclination.

Keywords

Stress concentration factor Stress risers SCF Structural steel FEA

Microstructural and Wear Characteristic of Fe-Based Nanostructured Hardfacing Alloy

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Conference paper
First Online: 29 December 2020

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Abstract

This study shows the effect of Fe-based hardfacing alloy deposited by GMAW on low carbon steel substrate on the microstructure and wear resistance. Optical microscopy and scanning electron microscopy were performed to examine and evaluate the microstructure of hardfacing alloy. Also, pin-on-disc wear test was performed on the weldment and wear resistance of the weldment was found to increase, due to the formation of carbide. The optical micro-graph of weldment shows the formation of carbide leading to increase in the hardness. No discontinuity and crack were in the weld zone.

Keywords

Hardfacing Hardness Abrasive wear Microstructure Carbide

References

Perspective on Effect of Metallic Fillers on Electrical Conductivity of FRP Composites

Recent Advances in Mechanical Engineering pp 659-665 | Cite as

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Conference paper
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Abstract

In general, the composites are electric insulators, but there are so many applications where the properties of composites are required along with partial conductivity. In aeronautical applications to avoid turbulence, it is required to provide electromagnetic shielding effect along with an increase in electrical conductivity. While improving electrical conductivity to serve the purpose for which the fiber-reinforced polymer (FRP) is fabricated, balancing other properties such as mechanical and thermal properties is an essential task. In this paper, a brief review of the previous work is carried out to understand the effect of various metallic fillers on the characteristics of FRP composite. After reviewing the scope of using metallic filler in FRP composites, it is figured out that the electrical conductivity of FRP can be improved by adopting metal particulates as fillers in the process of FRP fabrication. These procedures play an additional role in the FRP structure, and the electrical conductivity rises significantly in some of the cases.

Keywords

FRP Electrical conductivity Electromagnetic shielding Filler

Microstructural Evolution and Enhanced Mechanical Properties of Atomization Cast Al–40% Si Alloys

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Conference paper
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Abstract

Atomization casting is a technique to produce the semi-finished product in a single step from the raw metal. No further heat treatment is required in the product. In the ingot cast alloy, the segregation of second phase can be seen in the microstructure. Due to coarse microstructure of ingot cast alloy, the mechanical properties are not good as compared to atomization cast alloy. The confined convergent divergent nozzle is used in the atomization casting of Al–40% Si. The mechanical properties of atomized cast and ingot cast alloys are compared, and the properties of atomized cast alloys are found better than ingot cast alloys.

Keywords

Atomization casting Microstructure Tensile properties
Convergent divergent nozzle

References

Prediction of Wind Power Curve Based on Wind Speed and Direction Utilizing Artificial Neural Network

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Abstract

Wind power is dependent on several factors, and its prediction by complex mathematical model makes it prone to errors. Artificial neural network-based prediction models provides a solution to this problem. In this work, artificial neural network is employed for the energy prediction using wind direction and wind speed. Though the power curve is based on factors like wind velocity, air density, and swept area, there are many other dynamics which affect the performance of the wind turbines. A mathematical model is generated in the present work for wind energy production. The data is taken and fed to the back propagation algorithm in neural networks. The algorithm is run for thousand iterations, and by adjusting the weights, the model is created. It is observed that the prediction almost follow the actual power curve and hence can be used to predict different data of speed and direction.

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CrossRef (https://doi.org/10.1016/j.rser.2013.06.018)

Review of Effect of Nanofillers on FRP Composites

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Conference paper
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Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

A fiber-reinforced polymer (FRP) composite material may be defined as a judicious combination of two materials, i.e., reinforcing fiber and polymer matrix. The use of filler material is also very common to alter the characteristics FRP composites. A new area of FRP composite with nanofillers has emerged for scientific and industrial research in resent past. The inclusion of nanofillers into the FRP composite can enhance the mechanical, thermal, surface quality, erosion resistance, barrier, and flammability properties, without altering their processability. The objective of the review is to summarize the research work carried out in the field FRP composite filled with nanofiller and to draw the research gap for future work.

Keywords

Nano fillers FRP composite SiO_2 Al_2O_3 TiO_2 Carbon black SiC $CaCO_3$ CNT Graphene

Analysing Crane Hook of Different Cross Sections and Different Materials

Recent Advances in Mechanical Engineering pp 575-580 | Cite as

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Abstract

A crane hook or a lifting hook is used for picking up the load with the help of devices such as a hoist, chain or wire ropes. It is subjected to bending stresses which makes it highly prone to failure. To prevent structural failure of a crane hook, we must study the stresses induced due to loading and unloading as well as stress concentration pattern. This review paper looks at the findings established in previous publications to determine the optimum cross section and material combination.

Keywords

Crane hook Lifting hook Bending stress Structural failure

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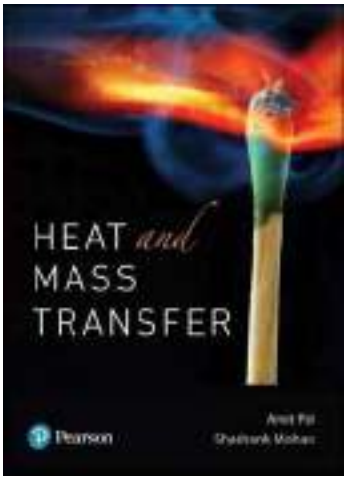

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Description

The First edition of HEAT AND MASS TRANSFER has been published to serve undergraduate students concerning with this extremely important domain of engine science. The book is written to gradually build up the concepts and inculcate mathematical abilities in students to solve real life problems in Heat and Mass Tran analysis. Book has been designed to make it student friendly, interesting and engag with special focus to provide a meaningful, correct and lucid explanation of the underlying concepts. Features: -Building up stepwise concepts with proper interlinki and apt illustrations. -Exhaustive and In-depth coverage of subject. -Plethora of Solv Examples, Multiple Choice Questions and Review Questions. -Coverage of Competit and University Exam questions. Table of Contents: Chapter 1) Introduction to Heat Transfer Chapter 2) Fundamentals of Conduction and Governing Equations Chapter Unsteady State Conduction Chapter 4) Numerical Approach for Solving Heat Condu Problems Chapter 5) Heat Transfer from Extended Surfaces Chapter 6) Fundamenta Convection Chapter 7) Heat Transfer by Forced Convection Chapter 8) Heat Transfe Free Convection Chapter 9) Boiling and Condensation Chapter 10) Heat Exchangers Chapter 11) Mass Transfer Chapter 12) Thermal Radiations: Process and Properties Chapter 13) Radiation Heat Exchange Between Surfaces

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Wear and enhancement of wear resistance – A review

Neha Bhadauria [a], Sunil Pandey [b], P.M. Pandey [c]

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https://doi.org/10.1016/j.matpr.2020.02.616

Abstract

This paper discusses the wear and its effect on the performance and life span of the components. The efforts made by researchers to improve the performance of materials have been discussed. Enhanced wear resistance has been reported due to refined grain structure and improved hardness. The reinforcement of particles is also reported to improve the wear resistance due to particle strengthening mechanism.

Keywords

Wear; Composites; Wear resistance; Surface composites; Wear mechanism

Special issue articles Recommended articles Citing articles (2)

Springer Link

A Comparative Analysis of Single Basin Solar Still with and Without Nanofluids

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Conference paper
First Online: 29 December 2020

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

Water is very essential to human life. The origin and the continuation of the mankind are based on water. The supply of drinking water is an important problem for the developing countries. The provision of fresh water is becoming an increasingly important issue in many areas of the world. Desalinating water using solar still is a green and economical option. Various experiments have been conducted on different designs of solar stills. It has been found that solar still with nanoparticles has better productivity. These suspended particles play a vital role to increase the heat transfer rate to water by changing the transport and evaporation process of base fluid. This paper summarizes the work of various researchers using nano-particles.

Keywords

Solar still Desalination Solar energy Nanofluids

References

A Review of Nanofiller Coating on FRP Composites

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Conference paper
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Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

In the present times, demand of fiber-reinforced polymer (FRP) composites materials is very high because of their enhanced mechanical, dynamic and thermal properties over the conventional material. The wide spread applications and growth of FRP composite demand need of protective coatings and barrier layers developed. The performance of composite in long term is heavily dependent upon the degree of protection provided to resist the corrosive and deteriorating environment to which these composites will be exposed. The use of nanofiller coating on FRP composite is expected to give significant protection against corrosion, blister or delaminate. A review of recent development in nanofiller coating of FRP composite along with overview of nanocomposite coating properties and characterization methods is presented in this paper.

Keywords

FRP Nanofiller Coating

Springer Link

A Review on Different Types of Hybrid Fiber Reinforced Composite

Recent Advances in Mechanical Engineering pp 523-529 | Cite as

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Conference paper
First Online: 29 December 2020

Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

Composite materials are the judicious combination of two or more different phase material which produces the synergetic effect when combined. The two essential components of composite are matrix called primary phase and reinforcement called secondary phase, and the combination of these two produces products having different properties from it constitutes. Fiber reinforced polymer (FRP) composites show their importance in the applications where low weight and high strength is the prime requirement. Further, the development of hybrid FRP composite is another milestone as hybrid composites provide freedom to tailor the properties of FRP composite as per requirement. Hybrid composites having more than one type of reinforcement and have extensive engineering applications where the necessity of high strength material with less weight and cost is required. In this paper, the authors have presented a short review of the current and past development in the field of FRP hybrid composite materials. The authors discussed the possibilities of different fiber hybridization as reinforcement in FRP composite and their characterization in brief.

Keywords

Composite FRP Epoxy

A Review Study on Solar Still: A Novel Approach of Solar Distillation

Recent Advances in Mechanical Engineering pp 531-537 | Cite as

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Conference paper
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Part of the Lecture Notes in Mechanical Engineering book series (LNME)

Abstract

Water touches each feature of life and access to pure water turns dilemma to clarity. Today, out of 843.2 million humans, every one out of nine, lack access to pure water and about 0.0139% of all water on our planet is potable & easily obtainable as well. While the 97% of water is salty and less than 2% is difficult to obtain. Due to this, about 14.8% of the world population is short of drinkable water. To overcome these problem various techniques were developed like MSFD, MED, RO, freezing, humidification and dehumidification, solar desalination, etc. This review paper discusses the works done so far on solar distillation. The solar-still is a boon in this field of solar desalination that uses natural rain water cycle in its operation and provides the pure water. The basic solar-still is the single-stage solar still whose efficiency lies between 30 and 40%. However, its efficiency can be brought up to 60% with different design and operational modifications.

Keywords

Solar energy PCMs Solar-still Distillation

Chapter Full-text available

Biomedical Applications of Additive Manufacturing

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In book: Recent Advances in Mechanical Engineering

Ankita Jaisingh Sheoran · Arunesh Chandra · Harish Kumar

Abstract and figures

Additive manufacturing (AM) is a comparatively new, widely growing manufacturing method on which a lot of research work has been carried out and it is still a booming field that has multiple applications in industrial, medical, military, automobile, aircraft industries, and in many more areas. This review is regarding the use of additive manufacturing for biomedical applications. This review presents how additive manufacturing has brought a revolution in medical applications, by building customized implants of different body parts as per customer-specific requirements, building prosthetics, and other medical devices as well. Additive manufacturing is rapidly being used because of its ability to bring about innovation in manufacturing extremely complex parts easily by building parts layer by layer; thus, giving it the flexibility to manufacture distinct or difficult parts, which are otherwise difficult to machine by traditional subtractive manufacturing. This article highlights the use of 3D printing in dentistry, wherein by using the 3D scanner, a CAD model of patient's dentures is generated which is studied upon and then manufactured by additive manufacturing for research or generating artificial customized dentures for the patients. The use of 3D-printed prosthetics, virtual surgical planning wherein by using CAD data, the vital body organs are 3D printed in a 1:1 scale for the surgeons to perform virtual surgery on the 3D-printed organ before actually operating upon the patients. Thus, 3D printing is proving a boon.

Biomedical Applications of Additive Manufacturing

Ankita Jaisingh Sheoran, Arunesh Chandra, and Harish Kum

Abbreviations

PEEK	Polyether ether ketone
SLA	Stereolithography
FDM	Fused deposition modeling
DMLS	Direct metal laser sintering
SLS	Selective laser sintering
API	Active pharmaceutical ingredients
EBM	Electron beam melting
SLM	Selective laser melting

1 Introduction

The intrinsic principle of AM for building parts in a layer-wise ma
extensive customization in fabricating patient-specific medical d

ments in AM techniques such as FDM, SLA, DMLS, EBM, SLM
of biomedical and health-care applications of AM can be classifie
sub-groups as depicted in Table [ ].

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Notes in Mechanical Engineering.

An aggregate methodology of process re engineering with the reverse logistics coordination in an OEM UNIT

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KIET group of institutions, Ghaziabad 201206, India

Abstract

Characteristic and financial issues stake significant effects on Reverse designing (Reengineering). These are a reflection to shape one of the advancing establishments of the legitimate production network. Reverse Logistics is a trick- unwavering directorial ingenuity, essentially reconsider and reform business training with the objective of completing reasonable stage on ward in quality, receptivity, outflow, customer contentment and other serious course performance measures. This investigation contributing an assessment of figuring out dream cantering upon, the utilization of instructive methods to give a move away from direct successive work relationship towards equal work and multi disciplinary collaboration.

Keywords: Introduction, development cycle of product, methodology, work structure, results & discussion, references

1. Introduction

It is an expediently developing order, which wraps countless activities. While regular designing believers building ideas and models into genuine segments, however in figuring out genuine parts are changed into designing models and ideas favored situation of the wide-running usage of computer assisted structures need not be rehashed now. BPR was first exemplified by Michael Hammer in quite a while fundamental article 'Re-designing work: don't mechanize, pulverize. **[1]**

1.1 Reengineering

The procedure is an organized, estimated set of exercises intended to create a predetermined yield for a specific client or market. It suggests a solid accentuation on how work is done inside an association.[2]

Elements

a. Tasks Reformation:

Join littler procedure sub-errands and sub-exercises into bigger, incorporated units and bundles. The administration ought to decrease the quantity of components, sections and ingredients in articles and procedures just diminish the quantity of parts in items and procedures.[13]

b. Workforce Reformation:

It permits the labourers to perform and co-ordinate bigger as opposed to littler segments of the procedure. The administration ought to energize multi usefulness, work turn, de-specialization and coordinated procedure structure.

c. Information Reformation:

Reformation, the capacity to arrange activities deliberately which is particular, atomized, and decrease to a machine extremity who can't facilitate the activity, however, just performs single and basic and orders. There requirement for a coordinated as opposed to the particular instruction. [3]

1.2 Reverse Logistics

"The way toward arranging, executing and controlling the productive, practical progression of crude materials, in-process stock, completed merchandise, and related data from the purpose of birthplace to the point of utilization to fit in with client prerequisites." [5]

Reverse Logistics/supply chain, the return business actions because of manufactured goods recovery, overflow form a clogged loop supply chain. The evidence achievements of RSCM premise on proportions of the two makers and supporters. [11] The time makers require delivering items that are simple for disassembling, reprocess, reuse and

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An Integrated Maintenance Management: A Practical Approach

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Conference paper
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Abstract

In the present-day competitive environment, industries are facing with a new crisis of shrinking profit margins. Organizations'/companies cannot ill afford quality, safety, poor environment and productivity issues. There is thus the requirement of an integrated approach towards management of maintenance. The aim is to present a framework for a programme for an effective continuous improvement of issues related to maintenance. Maintenance undoubtedly plays a key role in an organization's long-term profitability. In this article, there is a proposal for an integrated maintenance management. The suggested proposal is based on maintenance management, maintenance operation and equipment management (predictive maintenance, preventive maintenance, total productive maintenance). This article explores the benefits of integrated maintenance management compared with the traditional maintenance approach and discusses some of the latest tools in this area.

Keywords

Integrated maintenance management Productivity Preventive maintenance Predictive maintenance Equipment management TPM Benchmarking

References

Analyses of Temperature and Thermal Stresses of a Ceramic-Coated Diesel Engine Valve

Recent Advances in Mechanical Engineering pp 127-134 | Cite as

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Abstract

This work is carried out to detect temperature, thermal strain and stress variation in plasma-sprayed zirconia-coated valve head and further to enhance the function of a diesel engine. Impacts of thermal barrier coating (TBC) thicknesses on engine valve are analyzed, and additionally, examinations with results from an uncoated valve have been prepared. Temperature, thermal strain and stress investigation are performed for different thicknesses of zirconia coating, which varies from 0.2 to 1.0 mm. It was found that the valve head where coating was done is considerably having high temperature as compared to the uncoated valve head surface and also found that the coated surface temperature rises with coating thickness by declining rate. Result shows that the highest temperature expanded up to 33.81% for 1.0 mm thick TBC as compared to the traditional uncoated valve. With the help of TBC, temperature level is increased in combustion chamber, which enhanced the thermal efficiency of the engine and declined the substrate temperature. The average stress on the coated surface increases with increasing coating thickness up to a certain limit. Maximum stress achieves on the top coat surface, and approximately, its value is 1.5 times higher than the substrate. Additional benefits include protection of component metal surface from thermal distortion and reduced cooling necessities.

Keywords

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Enhanced Optical Response of Al, Rh, Ag, and Au Nanosphere Dimer in Uniform Electric Field

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ABSTRACT

Localized Surface Plasmon Resonance (LSPR) mediated electromagnetic field enhancement play a vital role in enhancing the performance of bio-molecular sensors, photovoltaic cells and Raman spectroscopy (e.g., in SERS) etc., to name only a few. It is now well established that the field amplification factor (mode squared field) ~10^6 for spherical shaped plasmonic nanoparticle dimers is significantly higher than the amplification factor of a monomer which is ~10^3. In this work, a theoretical and semi-analytical approach based on multipole spectral expansion is used to investigate the electric field enhancement in the gap region of spherical nanoparticle dimers of Al, Rh, Ag, and Au. The dimer exhibit rich spectra compared to its isolated counterpart. For example, in contrast to a monomer, the dimer spectra consists of multiple resonant peaks which can be fine tuned by varying particle size and/or inter-particle separation. Moreover, the enhancement in dimer is several orders higher than that in monomers. Rich spectral features in dimer spectra arise from the interaction between particle plasmons of constituent NPs and their hybridization, which results in the splitting of plasmonic energy levels. We carry out, systematic investigation of these systems to quantify the effect of particle size, interparticle separation and metal type (Al, Ag, Au, Rh) on electric field enhancement.

***Keywords*:** Enhancement, nanoparticle, dimer, plasmonics, hybridization

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2-Repeated Solid Burst Error Detecting Cyclic Codes

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ABSTRACT

In modern era, coding theory has found various applications in almost every field whether it is theoretical or practical. Such as: digital data transmission, medical science, space science, geographical sciences etc. It is natural that bursts have different behavior in different channels. But the burst errors are found to occur mostly in various communication channels. In some of the systems, lightening and other short term irregular disturbances introduce various types of repeated burst errors. Usually they operate in such a way that over a specific length, some digits in a message are received correctly, while all other are corrupted. It is very common in some extra noisy channels that all the digits in a burst are corrupted. Such type of errors is called 'solid burst errors'. It may also be mentioned that cyclic codes play a significant role in error detection and correction. In this paper, we obtain results for cyclic codes that are capable of detecting 2-repeated solid bursts of length *b*.

Keyword: Repeated solid burst errors, cyclic codes, burst error detection, parity-check digits

1. INTRODUCTION

It is perceptible that from last few decades, communication devices and computing have become essential parts of human life. Although current communication devices are very efficient and reliable yet unlimited usage causes interrupted data transmission. There may be any cause of that e.g., server fading, call-drop, dynamic noise, jamming multi access interference etc. These problems arise due to the occurrence of various types of multiple burst errors in the channel in use.

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Green Consumerism

Perspectives, Sustainability, and Behavior

Editors
Ruchika Singh Malyan and Punita Duhan

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CHAPTER 10

ANALYZING LONG-TERM BENEFITS IN THE FACE OF HIGHER UPFRONT COSTS FOR GREEN AFFORDABLE HOUSING: A STUDY OF GHAZIABAD, UP (INDIA)

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10.1 INTRODUCTION

A green building is one which uses less water, optimizes energy efficiency, conserves natural resources, generates less waste, and provides healthier spaces for occupants as compared to a conventional building. Considering the tremendous benefits that it offers, green building concept is gaining major importance in India. A common man wants an affordable house to live in which may fit in his pocket whereas the demand of the society is to go green as the pollution is increasing day by day. Affordable housing refers to housing units that are affordable by that section of society whose income is below the median household income. Though different countries have different definitions for affordable housing, it is largely the same, that is, affordable housing should address the housing needs of the lower or

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Prevailing Approaches and PCURE for Data Retrieval from Large Databases

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Conference paper
First Online: 30 November 2018

Part of the Lecture Notes in Networks and Systems book series (LNNS, volume 56)

Abstract

Tremendous and exceedingly vast data is collected, nowadays, by every organization which is getting continually increased. It became very difficult to retrieve relevant information from these endlessly rising large group of data. Data mining has emerged to retrieve precious information that gets buried in large databases. Among various functionalities of data mining, clustering became very effective in determining related data. This work is focused on CURE which is one of the most widely used hierarchical clustering techniques of data mining. It started its work by reducing the size of the original database. For that, it made the use of simple random sampling (SRS) technique, followed by partitioning of the reduced database. It also made use of other important techniques but still resulted in a number of shortcomings. It is required to eradicate the limitations in the traditional working of CURE clustering. So, this paper avoids the use of sampling and focuses on its enhancement by integrating it with the concept of "Map-Reduce" along with "Corewise Multithreading". This combination is useful for analyzing-searching huge voluminous data by providing the most effective ability of parallel processing, fault tolerance, and load balancing. The proposed approach is parallelization of one of the data mining clustering techniques—CURE and thus named as PCURE (ParallelCURE).

Keywords

Data mining | Clustering | CURE | Sampling | Parallelism | M2ing

Comparative Analysis of Position-Based Routing Protocols for VANETs

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Abstract— **Vehicular ad hoc networks (VANETs) have fetched great interest in both industry and research oriented fields owing to the highly mobile nature and randomly changing topology exhibited by these networks. These characteristics make them susceptible to frequent disconnections, contention and collision related problems. Designing a set of protocols which would cater to the characteristic features of VANETs is a very daunting task. This paper presents a detailed survey of a wide variety of Position-based routing (PBR) protocols. PBR protocols exploit the on-board global positioning receivers to acquire location information of vehicles. Moreover on-board maps are used to fetch the details regarding layout of the road thereby purging the need to set up and maintain routes between the vehicular nodes, making these protocols highly desirable for VANETs. Further a novel classification methodology of the protocols under study along with a comparative analysis depicting their similarity and dissimilarities has been presented.**

Keywords *— Position-based routing protocols; Junction; ITS; Data packet transmission; Routing strategies*

I. Introduction

The concept of VANETs, foundation of which was laid by a Japanese association named as JSK (Association of Electronic Technology for Automobile Traffic and Driving) in 1980 [1] has tapped many researchers into its deep exploration. Reason behind this is the unique characteristic features that VANETs are endowed with such as swiftly changing network topology leading to intermittent connectivity further, vehicular density, extent of mobility, unbounded network size, availability of abundant storage, energy facilities for the nodes, along with real time exchange of data packets to enable wireless communication, making them easily distinguishable from its super-class MANETs. These networks form self-organized paradigms of MANETs [2], where direction, traffic flow and traffic policies guide their course of action. Owing to the aforementioned characteristics VANETs form the focal point of Intelligent Transportation Systems (ITS) [3].

In VANETs vehicles act as mobile nodes comprising an on-board unit such global positioning system and digital map to gather information related to the vehicle's mobility and road layout [4]. Fixed infrastructure units in the network termed as RSUs are also been taken into consideration to form Vehicular ad-hoc networks. These RSUs are responsible for relaying messages among different vehicles as well as other RSUs in order to deal with connectivity issues, more prevalent in sparse regions.

This entire network layout forms a complete VANET environment where communication can be promoted via any of the three architectures [5]: Pure Cellular (I2V) where vehicles communicate only via road side units (RSUs) thereby eliminating direct communication between vehicles. Pure ad-hoc (V2V) which facilitates direct communication amid vehicles via sensors and no intervention of RSUs is needed and lastly Hybrid architecture, offering functionality of either of the other two architectures as per the need.

Vehicular ad-hoc networks find applicability in several areas like dealing emergency situations by helping drivers to make accurate decisions during hazardous road or weather conditions, infotainment applications such as distributed games, micro-blog and so on, comfort related applications, concerned about making driver's journey comfortable by use of vehicular services so on. Considering the diverse set of applications which VANETs serve and the highly dynamic features with which they are characterized, finding a suitable set of routing protocols becomes quite troublesome.

Researchers however have made several successful attempts in creating VANET oriented protocols [6] with the aim of ensuring communication by reducing overhead as well as minimizing the amount of network resources consumed. VANET routing protocols can be classified as: Topology based routing, Geo cast routing, Cluster based routing and Position based routing. *Topology based routing protocols* such as DSDV, AODV [7], HARP aim at finding link details among a pair of nodes and storing them in a table so that this data can be used in future. They are further categorized into proactive (table-driven), reactive (on-demand) routing and hybrid routing protocols [8]. These protocols are however not able to cope up with the highly frequent topology changes exhibited by VANETs, thus making them unfit for these networks. *Geocast-based routing protocol* is a position based multicast routing protocol with the aim of delivering the packet from source node to a group of vehicles within a specified geographical region called as zone of relevance (ZOR) [9]. The disadvantage of these protocols is that they are quite prone to showcasing

Exploration of Apache Hadoop Techniques: Mapreduce and Hive for Big Data

Authors: Poonam Rana, Vineet Sharma, P. K. Gupta

Publisher: Springer Singapore

Published in: Advances in Computing and Data Sciences

Abstract

With the rapid growth of technology, huge amount of data is being proliferated from various sources like sensor networks, IoT, online transactions, social media, etc. Big data is a collection of huge voluminous and complex data sets that include the large amount of data, social media analytics, real time data and data management capabilities. In some cases, the volume of this data has reached upto ZettaBytes. To analyze such a huge amount of data, traditional technologies are found inefficient. So, the new technologies of Apache Hadoop Distributed File System (HDFS) came into existence. In this paper, we have presented tools and technologies used in big data along with detailed description of MapReduce and Hive programming framework of Hadoop. Apache Hadoop consist of techniques and technologies that require new forms of combination to reveal large unknown values from large data sets that are diverse, complex and of massive scale.

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Prevailing Approaches and PCURE for Data Retrieval from Large Databases

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Conference paper
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Abstract

Tremendous and exceedingly vast data is collected, nowadays, by every organization which is getting continually increased. It became very difficult to retrieve relevant information from these endlessly rising large group of data. Data mining has emerged to retrieve precious information that gets buried in large databases. Among various functionalities of data mining, clustering became very effective in determining related data. This work is focused on CURE which is one of the most widely used hierarchical clustering techniques of data mining. It started its work by reducing the size of the original database. For that, it made the use of simple random sampling (SRS) technique, followed by partitioning of the reduced database. It also made use of other important techniques but still resulted in a number of shortcomings. It is required to eradicate the limitations in the traditional working of CURE clustering. So, this paper avoids the use of sampling and focuses on its enhancement by integrating it with the concept of "Map-Reduce" along with "Corewise Multithreading". This combination is useful for analyzing-searching huge voluminous data by providing the most effective ability of parallel processing, fault tolerance, and load balancing. The proposed approach is parallelization of one of the data mining clustering techniques—CURE and thus named as PCURE (ParallelCURE).

Keywords

Data mining | Clustering | CURE | Sampling | Parallelism | M2ing

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Query Optimization: Issues and Challenges in Mining of Distributed Data

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Conference paper
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Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 654)

Abstract

The technique of finding the optimal processing method to answer a query is called Query optimization, whereas a collection of various sites, distributed over a computer network is called Distributed Database. In Distributed Database, the site communicates with each other through networks. There are various issues arise during evaluation of query cost, among which the processing cost and a transmission cost are important. There are several algorithms developed to find the best possible solution for a particular query, but they all have their certai limitations. The optimizer is mainly concern on search space, search strategy, and the cost model. It primarily focuses on these three factors. The mining cost of a query depends on the order of evaluation of the operators, for the same query we can have different cost if the order i changed. Hence, to find the optimal cost for a particular query is emerging as an open challeng for many researchers. Therefore, the cost-based query optimization technique has emerged as an important concept for dealing with the query optimization. This paper explores the issues and challenges of query optimization in mining of distributed data.

Keywords

Query optimization | Distributed database | Cost-based optimization

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A Novel study of Continuous Monitoring with their Application into Various Domains

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Abstract: Continuous monitoring is both a process and technology used to analyze data associated with an operational environment. This is becoming a most now-a-days, as it provides an independence from an operative management. In this paper, we have carried out a survey of continuous monitoring and their application into various domains. We have prepared a tabular structure presenting its application into various domains.

Keywords: Continuous Monitoring, Risk Management

I. Introduction :

"Continuous Monitoring" a term that is both a process and technology, means different things to different people. NIST describes it as "a risk management approach to cyber security that maintains a picture of an organization's security risk posture, provides visibility into assets and leverages use of automated data feeds to quantify risk, ensure effectiveness of security controls, and implement prioritized remedies." It can be defined as a concept of monitoring to have data that causes certain action and relieve the analyst from operative management. It is a set of technology driven process, helping to fulfill a core organizational requirement.

Continuous monitoring is becoming a most now. With the advancement in technology and increased operational dynamics enables the system to change more rapidly. The traditional operative management techniques are no longer adequate, which highlights the high need of "Continuous Monitoring".

In this paper, we have reviewed the work carried out by various researchers on "Continuous Monitoring" and its applications. In the second section of this paper, we have presented a literature review of various applications of

"Continuous Monitoring" towards providing useful solutions for some critical real time situations. In the third section, we have presented the applications of Continuous Monitoring . In the fourth section, we have discussed the present scenario of continuous monitoring. In the fifth section, we have discussed the implementation of Continuous Logging from a string it receives from the network, in order to study continuous monitoring. In the sixth section, we have concluded that continuous monitoring has proven its worth into various real time applications by providing useful results.

II : Literature Review

In this section, we have presented a literature review of applications of Continuous Monitoring in various domains.

[1] GUIDE YVL C presented continuously operating radiation monitoring systems whose main purpose is continuous measurement of radioactive releases and sampling from the stack, and the determination of concentrations in a laboratory.

[2] Oryong-dong, and Puk-gu, Gwangju proposed a Continuous water toxicity monitoring system that can be used as an alternative tool for the quick monitoring and controlling the water quality, as well as aid in the setting up of a new monitoring strategy to protect the source of tap water and in the prevention of polluted water discharge.

[3]Jean Bedard, and Ryan Sanders, provided the guidance on how to protect Time and temperature sensitive pharmaceutical product (TTSPP) from damage by the correct use of electronic temperature monitoring systems. It also described the establishment of requirements and how to define specifications for these systems and how to assure data traceability which is generated.

[4] Minimax explained the continuously monitoring by smoke detectors and Gas extinguishing systems via using Novec™ 1230 extinguishing agent.

[5]Aleksandar Milenkovic, Chris Otto, Emil Jovanov presented health monitoring system using their prototype sensor network which utilizes off-the-shelf 802.15.4 compliant network nodes and custom-built motion and heart activity sensors.they represented system architecture and hardware and software organization. they also reported their solutions for time synchronization, power management, and on-chip signal processing.

[6] Dushyant Pande, Jeetender Singh Chauhan, Nitin Parihar proposed "temperature and lighting monitoring and control system" as an integrated device designed and implemented as cost efficient as possible that is intended to allow users to input specific requirements for a environment of some industrial as well as experimental setup to monitor as well as control temperature and light continuously.

[7]K.C. Kavitha, A.Bazila Banu proposed a design and developed a "Wireless health monitoring system" for remote patient monitoring in healthcare field. The main purpose of remote health monitoring system for patient monitoring is to continuously monitor patient's physiological health parameters such as pulse rate,breathing rate, blood pressure rate and patient's body movement, and project the same data of the patient's health to the doctor or hospital staff.but in their proposed system,extracting abnormal condition data from the

Smart Solar Energy Management to Power Computer Lab in Rural Areas

Publisher: IEEE

Neeraj Kumar Gupta ; Aditya Kumar Singh ; Ashish D. Thombre ; Kirti Pal **All Authors**

Abstract: An isolated solar PV system is a reliable solution to providing electricity in rural and remote locations. Such systems require an array of PV panels, charge controllers,... **View more**

Metadata

Abstract:

An isolated solar PV system is a reliable solution to providing electricity in rural and remote locations. Such systems require an array of PV panels, charge controllers, battery bank to compensate the supply & demand mismatch. The paper presents an evaluation of stand-alone photovoltaics (PV) system installed on the roof of EN Dept. building, KIET Group of Institutions, Ghaziabad. The experimental data was recorded for month of August 2018 through IoT. This project aims to encourage the use of small stand-alone solar PV system to supply power to laboratories in rural areas & remote locations. In this project we also develop a cost-effective energy management solution for data logging & monitoring is done by Wi-Fi based Internet of things (IoT) system that can be accessed from anywhere.

Keywords

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Contents

Electricity plays a crucial role in the development of the society. It is a fundamental part of our life and one can't think of a world without electricity. Yet, over 1 billion people in the world do not have access to electricity. Of this, over 95% live in developing countries and over 84% reside in rural areas [1]. At the same time, we face the issue of depleting reserves & increasing cost of fossil fuels. Additionally, there is special focus on the major problems of Global Warming & pollution. These issues prompt us to reduce our dependence on fossil fuels as the primary source of energy. Due to this, the need of the hour is to develop and utilize renewable resources like solar, wind, geothermal, bioenergy& many more. Amongst these, solar energy is the one with the most potential. The approximate emission power from the sun is 1.8×10^{11} MW [2].

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SMALL SCALE POWER GENERATION FOR RURAL HOUSEHOLDS

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Abtract: This paper includes details about a project to build a human powered generator with the help of a bicycle. This can be used for upto 120watts DC. This project will help to develop a clean way of generating electricity. It is intended to be both achievable and affordable.

Keywords: portable generator, clean electricity, low cost power generation

I. INTRODUCTION

The purpose of this project is to build a human powered generator with the help of a bicycle which is also portable and can be used to power small appliances such as dc fans, light bulbs etc. This project will help to develop a clean way of generating electricity. It is intended to be both achievable and affordable. By using principles of energy conversation a small amount of power source can be developed which can be used in rural and remote areas. The chemical energy in a person's body is converted into mechanical energy using a bicycle and then further into the electrical energy with the motor. This energy is stored in a battery for further use.

II. LITERATURE REVIEW

[10] A remote village has limited access to electrical power and, as a result, the village homes are lit with candles and kerosene lamps after dark. Narrow mountain paths limit the access to neighbouring villages and limits the supply of diesel for the village's generators. The task is to develop a small and sustainable source of electricity for the village. [7] The intention is to create a system that can be used to generate and store enough energy to light an LED or any other small appliance for about 10

minutes.It is intended to be both achievable and affordable. [1] The chemical energy in a person's body is converted into mechanical energy with the use of bicycle and then further into the electrical energy with the motor. By hand-cranking the bicycle pedal at different speeds we will discover that at higher speeds the lamp will get brighter. We shall also discover that the sound emitted by the speaker gets higher in frequency and amplitude (volume) as the pedaling speed is increased. If the speaker or lamp has weak output, we will connect one at a time. An oscilloscope can also be connected to the dynamo to show the sinusoidal waveform. The loads provided should be appropriately matched to the dynamo's output. This energy can be measured by using a microcontroller and LCD display to display instantaneous power.

An Ultra Thin Body Nanoscale Dual Material Double Gate SOI MOSFET

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***Abstract*—In this paper, we compare the performance of symmetrical dual material double gate (SDMDG) SOI MOSFETs and asymmetrical dual material double gate (ADMDG) SOI MOSFETs. We investigate the influence of gate engineering on the analog performances of both the device structure for system-on-chip applications using a 2D device simulator (Silvaco TCAD). The gate engineering technique used here is the dual metal gate technology. The SDMDG structure shows better immunity to DIBL, near ideal Sub-threshold Slope (SS), high I_{on}/I_{off} ratio and improved analog performance like trans conductance generation factor, TGF (g_m/I_d), output conductance (g_d).**

***Keywords*— SDMDG, ADMDG, DIBL, trans conductance generation factor.**

I. INTRODUCTION

As the bulk MOSFET is scaled down, the control of short channel effects becomes increasingly difficult leading to increased sub-threshold leakage current.[1] This is because the source/drain influence over the channel potential becomes significant relative to the gate control. Advanced transistor structures such as the UTB and the DG-MOSFET eliminate sub-surface leakage paths and extend the scalability of Si CMOS technology.[2] In the DMDG SOI MOSFETs structure, the surface potential is characterized by a step function, due to this potential profile the drain voltage is screened, reducing the drain induced barrier lowering (DIBL). The step potential profile is achieved by the use of different gate materials.[3] The use of DMG also increases the carrier transport efficiency and in turn increases the I_{on} of the device.[4] In the DMDG MOSFETs structure, P^+ poly is close to the source end, named M1, and N^+ poly is close to the drain end, named M2. In conventional single metal gate device, the electric field near the source is lowest and reaches the peak value at the drain end. Due to this reason, the hot electron injection between the gate and drain makes the device unreliable, and reduces its lifetime. Thus, the primary intention is to keep the peak electric field under the gate, and not near the drain end, without degrading the Ion. Hence, DMDG architecture is implemented for which the carriers will be accelerated more rapidly and the hot electron injection problem is also avoided. This architecture will thus improve the average carrier velocity which in turn enhances the I_{on}. The improvement in I_{on} and DIBL suppression is achieved for lower work-function metal near the drain side (M1 > M2). [5-9]

In this paper, the parameters considered for the comparison between SDMDG and ADMDG SOI MOSFETs are drain induced barrier lowering (DIBL), the Sub-threshold Slope (SS), the I_{on}/I_{off} ratio, the threshold voltage (V_{th}), the trans conductance (g_m), the trans conductance generation factor (g_m/I_d) and the intrinsic gain (A_v). For ultralow-power, high gain analog/RF circuits, the gate oxide thickness, ($t_f = t_b = t_{ox}$) and the silicon body thickness, t_{si} are optimized with the help of ATLAS 2-D numerical device simulator and a comparison is performed between these devices.

The model used in the simulation are the inversion-layer Lombardi constant voltage and temperature (CVT) mobility model, that takes into account the effect of transverse fields, along with doping and temperature dependent parts of the mobility and the Shockley–Read–Hall (SRH) model simulates the leakage currents that exist due to thermal generation. The Gummel's method (or the decoupled method) which performs a Gummel iteration for Newton solution.

II. DEVICE STRUCTURE

Depending upon the way the gate material used, DMDG MOSFETs may be categorized as following:

A. Asymmetrical DMDG (ADMDG)

An asymmetric DMDG-MOSFET consist of front gate having P^+ poly and N^+ poly Si material contacting laterally whereas the back gate have N^+ poly Si material only. The device structure is shown below as:

Study and Analysis of Environmental Issues for Scaled Version of Si-Ge Heterojunction Bipolar Transistor

Publisher: IEEE

Alok Kumar Pandey ; Arun Kumar ; Sheetal Singh All Authors

Abstract: Nowadays Si-Ge HBTs are playing an important role in the field of RF and microwave applications. Also Scaling of a device is an advance fashion in the innovation. In this... **View more**

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A Qualitative Analysis of Secured Handover Management Schemes for Mobile IPv6 Enabled Networks

Publisher: IEEE

Arun Kumar Tripathi ; Surendra Kumar Tripathi **All Authors**

Abstract: Development in wireless technologies permits IPv6 enabled handheld mobile devices to access the Internet ubiquitously. An IP-address is required to identify the mobile ho... **View more**

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Abstract:

Development in wireless technologies permits IPv6 enabled handheld mobile devices to access the Internet ubiquitously. An IP-address is required to identify the mobile host on the Internet. Mobile IPv6 (MIPv6) scheme enables a mobile host to migrate from one subnet to another without changing its exiting IP-address. For IPv6 based mobility, Internet Engineering Task Force (IETF) proposed standard Mobile IPv6 as first mobility management scheme. It provides a powerful and flexible way to handle handover management. Standard MIPv6 is a host-based global mobility management scheme and endure from basic issues such as signaling overhead, handover latency and packet loss. Subsequently, IETF has standardized localized network-based Mobility Management schemes to overcome problems associated with global host-based

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mobility management schemes named as Proxy Mobile IPv6 (PMIPv6). It reduces handover latency and packet loss compared to host-based mobility management schemes considerably, yet, suffers from security issues. Later on, researchers proposed secured-PMIPv6 protocols for authentication of mobile as well as network devices within LMD. The paper reviews various handover management schemes for secure handover management. The performance of various schemes qualitatively investigated on vital parameters such as authentication cost, signaling cost, packetloss etc.

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Contents

Advancement in the field of mobile and wireless technology has affected our lives significantly and compelled us to shift from a fixed wired network to the wireless and mobile network. In the last decade, wireless technologies have increased 1000 fold in data rate approximately. Nowadays, wireless multifunctional terminals such as smart phones, laptops, personal digital assistants, navigation systems etc. have become part of our daily lives. These mobile terminals support a large number of multimedia applications such as social media applications, live video streaming, online games etc. To provide uninterrupted services to these devices, the volume is increasing exponentially day by day. Analysis by Computer Information System Company (CISCO), reveals that the mobile data traffic may grow up to 49 Exabytes per month by the year 2021, which is approximately seven times of the data traffic in 2016. In addition to this, the mobile data traffic may increase at a Compound Annual Growth Rate (CAGR) of 47% from year 2016 to year 2021 [1].

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Design of Multi-band Antenna

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Abstract:--

A new method for designing the multiband antenna is presented in this paper. In this method, two split ring slots with opposite gap facing is mounted on circular patch antenna. This configuration uses probe feeding technique along with RT duroid 5880 substrate. To create different short circuits along the slots the electric field is manipulated The resonance frequencies are chosen to increase the number of bands at which antenna can operate. Advance Design system 2011-10 is used for the simulation of this design. Results verify its multiband operation.

Keywords:--

Multiband, probe feed, patch antenna, resonant frequencies.

Space based solar power-a review

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Abstract

In the recent decades, there has been a huge energy demand due to the exponential increase of the human population and consequently, the depletion of non-renewable energy sources. This creates the need to explore alternate routes for renewable energy resources. The solar energy was the best alternative of the conventional energy system in last few decades, but because of intermittent energy and huge land area requirement it is the need of the hour to look for an alternate solar energy system. ***Space-based solar power (SBSP)*** *is a step towards this technology to overcome the limitation of intermittent supply as solar energy is always available in the space. SBSP is the concept of collecting* solar power *in* outer space *and distributing it to* Earth*. Potential advantages of collecting solar energy in space include a higher collection rate and a longer collection period due to the lack of a diffusing* atmosphere*, and the possibility of placing a solar collector in an orbiting location where there is no night.*

1. Introduction

Energy generation to meet the demand is a very big issue, and almost 10-15% of the total economic expenditures in the world are used for meeting this supply and demand [1]. The total resources which can be used for energy generation in the world can be broadly categorized into fossil fuels, renewable sources and nuclear resources. The fossil fuels and nuclear sources comes under the category of non-renewable sources further[2]out of these three sources of energy, fossil fuels are the conventional sources which are used to meet the major portion of the energy requirements in the world but they are depleting with time and also have adverse consequences such as global warming. Nuclear sources are also harmful for the living beings. This lead to shift towards renewable sources which is the best promising alternative of energy generation as compared with the above two categories of energy sources. The renewable energy source includes solar energy, wind energy, and hydel energy. Out of these solar energy was used and researched in last few decades, but because of its intermittent supply, it is not a very efficient energy generation system. So, the researchers thought to overcome this limitation by generating the energy directly in space where the availability of sunlight is always there using satellite and then transmit it to the earth. SBSP is an effort related to this initiative. Although the proposed system is in research state and not in use anywhere till now, but the researchers are targeting to achieve it till the end of 2025. In the present system which converts solar energy in to electrical energy, a considerable fraction of incoming solar energy (55–60%) is lost on its way through the Earth's atmosphere by the effects of reflection and absorption. But in Space-based solar power, the system convert sunlight to microwaves outside the atmosphere, avoiding these losses and the downtime due to the Earth's rotation, but at great cost due to the expense of launching material into orbit. SBSP is considered a form of sustainable or green energy, renewable energy, and is occasionally considered among climate engineering proposals. It is attractive to those seeking large-scale solutions to anthropogenic climate change or fossil fuel depletion (such as peak oil).

1.1 History

In 1941, science fiction writer Isaac Asimov published the science fiction short story "Reason", in which a space station transmits energy collected from the Sun to various planets using microwave beams. The SBSP concept, originally known as satellite solar-power system (SSPS), was first described in November 1968[6]. In 1973 Peter Glaser was granted U.S. patent number 3,781,647 for his method of transmitting power over long distances (e.g. from an SPS to Earth's surface) using microwaves from a very large antenna (up to one square kilometer) on the satellite to a much larger one, now known as a rectenna, on the ground[7]. Glaser then was a vice president at Arthur D. Little, Inc. NASA signed a contract with ADL to lead four other companies in a broader study in 1974. They found that, while the concept had several major problems – chiefly the expense of putting

A Study on Green Energy Powered Cognitive Radio Network for Communication Network Architecture of Smart Grid

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Abstract–High information rate applications in smart grid can incredibly increase energy consumption, which has incited to an emerging trend of addressing the *energy efficiency* aspect of communication technology. Green energy powered cognitive radio (Green-CR) network is important technology to meet the high information rate prerequisites as well as to improve spectrum and energy efficiency. However, designing Green-CR networks for smart grid is challenging as it requires not only the optimization of dynamic spectrum access but also the optimal utilization of green energy sources. In this paper, spectrum aware and energy efficient Green-CR network model is introduced to overcome spatio-temporally varying spectrum characteristics and harsh environmental conditions for smart grid applications. Subsequent to presenting fundamental outline standards potential advantages and network architecture of Green-CR, a multi layered approach with small cells for efficient design methodology is proposed to provide energy efficient CR network at the smart grid utility.

Keywords–green cognitive radio network, smart grid, energy harvesting, green communication.

I. INTRODUCTION

Wireless communication plays an imperative part in realizing all essential features of smart grid such as, efficiency, reliability, resilience, sustainability and security [1], as it can offer smart grid a much greater degree of freedoms for information accumulation, dissemination, and processing than wired communication infrastructure. With the unique features of dynamic spectrum access technique, CR networks have the potential to make best utilization of scarce spectrum and support increasing demand for wireless applications including smart grid.

CR networks are context-aware reconfigurable wireless networks consisting two frameworks: the primary user (PU) framework and the secondary user (SU) framework. PUs are licensed users i.e. the have selected benefit to get to the licensed bandwidth, while the SUs are the unlicensed users in cognitive radio, which can just get to the bandwidth that is not utilized by the PUs [2]. Proposed CR framework based communications infrastructure guarantees to use possibly all spectrum resources efficiently in the smart grid. The idea of applying CR technology to smart grid was first proposed by A. Ghassemi *et al.* [3] in which the authors proposed to utilize CR based IEEE 802.22 standard in wireless regional area networks (WRANs) for smart grid backhaul data streams.

Different from current CR systems powered by the reliable on-grid energy source, continuous advances in green energy motivated us to concentrate on green energy powered networks. On the off chance that the green energy source is ample and stable in the sense of accessibility, CR system can be powered to opportunistically exploit the underutilized spectrum by harnessing free energy without requiring energy supplement from external power grid or battery [4]. As the smart grid advances and develops, green power farms that harvest energy from green sources can substantially reduce carbon footprints. The need for adopting green communication has been realized worldwide. There is a focus on following holistic approach for power optimization. The next generation architectures focus on developing new technology, cell deployment strategies and resource allocation policies to improve the energy efficiency of a wireless communication network. Akshita et al [5] surveyed various techniques for power optimization of the next generation wireless networks. Further, [6] developed green communication model for next generation wireless networks, which considers both the access and backhaul network elements. So far, a green communication architecture for smart grid communication architecture has not been premeditated.

The aim of this paper is to offer a comprehensive review on the recent works on the applications of CR network technology in smart grid, based on which we want to show an evolutional path of smart grid development based on spectrum aware and energy efficient Green-CR networks.

The rest of this paper is outlined as takes after Section II expounds energy challenges in cognitive radio. Section III presents the Green-CR network technology in the smart grid communication infrastructure. In the same segment, energy efficient CR systems with small cells are additionally talked about. Step by step instructions to green energy utilization in the smart grid environment, is examined first, in which only the energy dynamics is considered. This will provide some insights for the information transmissions in the CR system. At that point, with the introduction of spectrum dynamics, the energy utilization is discussed in Green-CR networks. Section IV discusses system model for smart grid communication infrastructure, followed by the conclusion drawn in Section V.

II. COGNITIVE RADIO ENERGY CHALLENGES

A CR system must make real-time decisions on continuous choices about which spectrum hole to sense, when, and for what surviving. The detected range data must be adequately sufficient to achieve exact conclusions with respect to the radio environment. Besides, spectrum sensing must be quick so as to track the transient varieties of the radio environment. Such

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Contingency Analysis and Security Constraint based Optimal Power Flow in Power Network

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Abstract: The objective of the present work is to observe the application of security constraint optimal power flow (SCOPF) technique in contingency management of power system. The... **View more**

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Abstract:

The objective of the present work is to observe the application of security constraint optimal power flow (SCOPF) technique in contingency management of power system. The contingency situations in power networks such as line outages and generation outages have been managed by using SCOPF solutions. The generation levels of various generators have been optimally rescheduled during contingent situation using SCOPF based load dispatch technique. In SCOPF, various other system constraints such as congestion, voltage deviation, and loss minimization have also been taken into account to achieve economic performance in the system. The interior point method (IPM) technique has been used to obtain the test results. The IPM based SCOPF methodology has been tested on an IEEE-9 bus system. The obtained test results show

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that the IPM based SCOPF technique provides efficient solutions for economic load dispatch in power network during normal and contingent situation of line and generation outages.

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Contents

The Power system is one of the leading fields where various operational activities have been involved, such as operational problems of a power system, security, reliability, and cost-effective load dispatch. One of the most challenging issues of modern power system infrastructure is analysis of contingency and optimal management methods. To insure a continuous power flow in power networks for meeting consumers' demand during contingency situations have also been a challenging task among the operators. The term, contingency analysis, is one of the most essential issue for establishing Power Management Systems (PMS) in power networks. The establishment of PMS in power networks is required advance analytical tools and algorithms for contingency analysis [1]. The objective is to provide a cost effective solution for power system operators. Mostly, the contingency situations raised because of generation and line outages [2]-[3]. In this situation, it is assumed that the system having capability to fulfill the power demands of the consumers through reserve capacities of the generators in the system. The rescheduling of generation is one of the usual practice adopted by the system operator [4]. Sometimes, the rescheduling decision making will be complex for the operators. Thus the optimal power flow (OPF) based system operation provide good solutions, especially during contingency [5]-[7].

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Disturbance Observer Based Robust Control Design of Variable Speed Wind Turbine

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Alok Kumar Pandey ; Bhanu Pratap ; Akhilesh Swarup All Authors

Abstract: This paper investigates the design of a robust control for two mass model (2-MM) of a variable speed wind turbine (VSWT). The VSWT is a class of nonlinear system with a h... **View more**

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Abstract:
This paper investigates the design of a robust control for two mass model (2-MM) of a variable speed wind turbine (VSWT). The VSWT is a class of nonlinear system with a high degree of uncertainty of irregular wind speed. The uncertain behaviour of wind speed is directly unmeasurable due to the high cost of sensors. Thus, the proposed control strategy is designed on the basis of disturbance observer which avoids the construction of inverse operator leads to the problem of singularity. The closed-loop 2-MM VSWT system stability is established as asymptotically stable. The simulation results reveal the performance and robustness of the proposed control algorithm for 2-MM VSWT system.

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Contents

Among various renewable energy sources, wind energy considers as the most promising source. It is supplying 3.7 % of global energy production and can be increased to 15%-18 % by 2050 as suggested by the international energy agency. Annual growth production of wind energy is 22 % from 2000 to 2015 [1], [2]. For maximum extraction of wind energy, it is necessary to maintain a constant rotational speed of the rotor. A control strategy is required to maintain rotor speed of variable speed wind turbine (VSWT) due to continuous change in the wind speed. However, a lot of challenges are still there like control of its dynamics, effective harvesting of energy and to maintain its robustness during irregularities that include velocity and direction of the wind so that it is infeasible to extract total power [3].

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Energy Conservation: Analysis & Improvement through Energy Audit

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***Abstract*— Energy generated from either conventional or non-conventional resources are generally not fully utilized in efficient way results in overconsumption, reduced energy efficiency & increased cost. Effective energy scheduling through energy audit results in smart & efficient energy consumption. Energy auditing had been conducted based on one year KWH consumption in KIET Group of Institutions Ghaziabad and various recommendations through this paper will be necessarily helpful for all educational buildings to minimize energy consumption & improving energy conservation.**

***Keywords*-- Energy audit, energy scheduling, energy consumption**

I. INTRODUCTION

Krishna Institute of Engineering and Technology (**KIET**) is a private engineering institute affiliated to Dr. A.P.J. Abdul Kalam Technical University, situated in Ghaziabad in the National Capital Region of India 30 km from Delhi. The institute is ISO certified and NBA accredited. The institute was started in 1998 under the aegis of the Krishna Charitable Trust. The institute has 8 academic departments, 3 boys hostels, 3 girls hostel, Auditorium, TBI, Central Library, a Multi-Purpose Complex with a focus on education in engineering, sciences, pharmacy and management. As on the date, the student strength of the institute is about **5341** with total faculty plus staff strength of about **529** and over an area of about **21** acre. The institute connected load is **1112 KVA** and annual electricity bill keeps up in several (**Cr)**. This huge electricity bill attracts the attention naturally. Making the institute energy efficient will not only concern with reduction in electricity expenses but also helps us to remind our moral responsibilities of not wasting this precious resource which may be used by people of the country in need**.**

A. Objective of the work

The objective of Energy Audit is to promote the idea of Energy Conservation in the Campus of KIET Ghaziabad. The purpose of the energy audit is to identify, quantify, describe and prioritize cost saving measures relating to energy use in the Hostels, Departments and Institute Central Facilities [3].

The work eligible for Energy Audit Study should be directed towards:

•Identification of areas of energy wastage and estimation of energy saving potential in Hostels, Departments and Central Facilities.

• Suggesting cost-effective measures to improve the efficiency of energy use.

• Estimation of implementation costs and payback periods for each recommended action.

• Documenting results & vital information generated through these activities.

•Identification of possible usages of co-generation, renewable sources of energy (say Solar Energy) and recommendations for implementation, wherever possible, with cost benefit analysis, and to reduce environmental effects.

B. Audit Methodology

The methodology adopted for this audit was a three step process comprising of:

1. Load Calculation & Testing of measuring devices In preliminary load calculation phase, exhaustive data collection was performed using different tools such as observation, interviewing key persons, and measurements. Power analyzer, lux meter used for this purpose is well tested by Lamp Load methods [14].

Following steps were taken for Load collection:

- The team walk through each department, center, hostel etc.
- Information about the general electrical appliances was collected by observation and interviewing.
- The power consumption of appliances was measured using power clamp meter.
- The details of usage of the appliances were collected by interviewing key persons e.g. Warden (in case of hostels), caretaker (in case of departments) etc.
- Light intensity was measured using lux meters at

978-1-5386-6472-8/18/$31.00 ©2018 IEEE

Simulation Modelling of DC-DC Converter for Grid Side Connected Inverter

Publisher: IEEE

Ranju Yadav ; Ankit Singhal ; Ashish. D. Thombre **All Authors**

Abstract: With the increasing demand of electrical energy, it became the necessity of human being and due to this its generation and utilization become one of the important concern... **View more**

Metadata

Abstract:
With the increasing demand of electrical energy, it became the necessity of human being and due to this its generation and utilization become one of the important concerns of the researchers, developers as well as for the industrialist. Different methodologies are achieved to harvest energy and convert it into required form with efficient use. In this paper a boost converter is used for the conversion of low DC voltage into high DC voltage with remodeled inverter and then voltage source inverter (VSI) synchronization to the grid is done. This paper consists of modeling of DC-DC converter for grid side connected inverter and presented the related output waveforms. Proposed circuit is simulated in MATLAB/SIMULINK 2013 and simulation results are provided.

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Simulation of Three Phase Voltage Source Inverter Based on SVPWM Technique

International Conference on Nano for Energy and Water

ICNEW 2017: Nanotechnology for Energy and Water pp 141-146 | Cite as

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Conference paper
First Online: 27 September 2017

Part of the Springer Proceedings in Energy book series (SPE)

Abstract

This paper presents simulation of two level voltage source inverter based on SVPWM (space vector pulse width modulation) technique. The concept of two level inverter is used to reduce the harmonic distortion in output voltage waveform without decreasing the inverter output power. Simulation results are presented to realize the validity of SVPWM technique.

Keywords

Voltage source inverter PWM SVPWM LCL filter with series damping resistor

References

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Improved Mathematical Modeling and Analysis of Photovoltaic Modules and Arrays

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***Abstract*—Solar Photovoltaic array is non-linear power source and under varying environmental conditions it is time consuming and extravagant to obtain operating characteristics. In order to overcome these restrictions an improved model of solar module/array has been proposed, this paper presents a step-by-step method for the simulation of SPV panels/arrays in MATLAB/Simulink. The governing curves of SPV array are also investigated for vast range of environmental conditions, substantial parameters and array configurations. The proposed method gives an exact decisive and easy to tune model of SPV array. Moreover, it provides an improved analysis of SPV array for various substantial parameters (series, parallel resistance, diode factor etc.) and environmental conditions (irradiance, temperature and partial shading) aspects.**

***Keyword*—photo-voltaic array, photo-generated current, solar irradiance, ambient temperature, single-diode model, series and parallel resistance**

I. INTRODUCTION

Solar power is a fast-growing industry in India and as of December 2016, the country's solar grid had a total capacity of 9 giga watts (GW). In January 2016, the Indian government expanded its solar plans to 100 GW of capacity, including 40 GW directly from solar rooftop, by 2022. The infinite, renewable, clean and noiseless nature of the solar energy makes it the most preferred sources of renewable energies which are increasingly finding application areas in today's human life [1]. However, despite of the mentioned advantages, this clean energy source has some disadvantages which should be overcome for an efficient use. High production costs of Photo Voltaic panels, less availability of efficient energy storage devices and dependency of energy production on the environmental conditions is some of the main issues which comes while production of solar energy[2,3,4].

The elemental entity responsible for the conversion of solar energy directly into electrical energy in a Solar Photo Voltaic (SPV) system is referred as SPV cell [6, 7]. The congregation of these SPV cells generally connected in series forms a SPV module. In order to get desired voltage level these modules are connected in series and to get desired current level modules are connected in parallel or surface area of each cell is increased. A SPV array can be a module or combination of modules in series and parallel configuration [8].

There are two ways to use output of SPV array 1) using DC output of array without any processing 2) using Power electronics converter for further processing of output power [16, 21]. The second method helps operates SPV array at optimal point by altering parameters at load side and controlling flow of power in grid connected system [4]. In order to study the performance of SPV system we require model that correctly stand for SPV cells, modules and arrays.

The main work in this paper is improved mathematical modeling of SPV cell/module/array and development of simulation model of module as well as array that correctly represents prevailing modules/array.

II. IDEAL PV CELL

When PV cell is exposed to light (photon), electrons are pushed out creating electron-hole pair in semiconductor material. If positive and negative terminals are connected to the conductors, having a closed electric network, constitutes photon generated current I_{Ph}. Therefore PV cell is PN

Energy Conservation: Analysis & Improvement through Energy Audit

Publisher: IEEE

Sudhir Kumar Singh ; Brajesh Kumar Tiwari ; Alok Kumar Pandey All Authors

Abstract: Energy generated from either conventional or non-conventional resources are generally not fully utilized in efficient way results in overconsumption, reduced energy effic... **View more**

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Abstract:
Energy generated from either conventional or non-conventional resources are generally not fully utilized in efficient way results in overconsumption, reduced energy efficiency & increased cost. Effective energy scheduling through energy audit results in smart & efficient energy consumption. Energy auditing had been conducted based on one year KWH consumption in KIET Group of Institutions Ghaziabad and various recommendations through this paper will be necessarily helpful for all educational buildings to minimize energy consumption & improving energy conservation.

Published in: 2018 3rd International Innovative Applications of Computational Intelligence on Power, Energy and Controls with their Impact on Humanity (CIPECH)

Metrics

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ISBN Information: **Publisher:** IEEE

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I. INTRODUCTION

Krishna Institute of Engineering and Technology (KIET) is a private engineering institute affiliated to Dr. A.P.J. Abdul Kalam Technical University, situated in Ghaziabad in the National Capital Region of India 30 km from Delhi. The institute is ISO certified and NBA accredited. The institute was started in 1998 under the aegis of the Krishna Charitable Trust. The institute has 8 academic departments, 3 boys hostels, 3 girls hostel, Auditorium, TBI, Central Library, a Multi-Purpose Complex with a focus on education in engineering, sciences, pharmacy and management. As on the date, the student strength of the institute is about 5341 with total faculty plus staff strength of about 529 and over an area of about 21 acre. The institute connected load is 1112 KVA and annual electricity bill keeps up in several (Cr). This huge electricity bill attracts the attention naturally. Making the institute energy efficient will not only concern with reduction in electricity expenses but also helps us to remind our moral responsibilities of not wasting this precious resource which may be used by people of the country in need.

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Keywords

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A Bibliographical View on Research and Developments of Photovoltaic and Thermal Technologies as a Combined System: PV/T System

Anmol Gupta, Sourav Diwania, Sanjay Agrawal, Anwar S. Siddiqui and Yash Pal

Abstract In this hybrid photovoltaic thermal (PV/T) system, air or water is utilized as a circulating fluid which helps in maintaining electrical efficiency as well as utilization of thermal energy (space heating, crop drying, etc.) at the output. In this article, a review of innovative work in the field of PV/T system and thermal modelling of PV/T collector is presented. The thermal model having different equations for PV-integrated flat plate collector, energy balance for air or water heating system stored thermal energy, the instantaneous energy efficiency and the instantaneous exergy efficiency has been presented. Analytical articulations for different thermal parameters and electrical parameters, considering energy balance for several segments or components of PV/T collector is obtained. Various optimization techniques used in the field of PV/T collector, in view of the exergy concept is also presented.

Keywords Exergy efficiency · Photovoltaic thermal · Optimization · Genetic algorithm

NOMENCLATURE

α_t	Absorptivity of glass
b	Width of PV/T collector (m)
L	Length of PV/T collector (m)
dx	Small length (m)

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A_c Area of the solar cell (m^2)
I_{sl} Solar radiation intensity (W m^{-2})
η_c Efficiency of the solar cell (%)
$C_{a/w}$ Specific heat of air/water (J kg^{-1} K)
$m_{a/w}$ Mass flow rate of air/water in the channel (kg/s)
$Q_{U,N}$ Useful heat gain for N no. of channels (kWh)
h_{p1} Penalty factor due to the presence of solar cell material, glass and EVA
T_a Ambient temperature (°C)
T_c Solar cell temperature (°C)
T_{bs} Temperature of the back surface (°C)
T_{aw} Temperature of air/water (°C)
α_c Absorptivity of solar cell
β_c Packing factor of solar cell
h_t Heat transfer coefficient of tedlar (W/m^2K)
τ_g Transmittivity of glass
U_{ca} An overall heat transfer coefficient from the solar cell to ambient (W/m^2K)
U_t Convective heat transfer coefficient through the tedlar (W/m^2K)
h_{p2} Penalty factor due to the presence of an interface between tedlar and working fluid

1 Introduction

Hybrid PV/T technology is a combination of both solar thermal and solar photovoltaic technology. A solar photovoltaic system changes sunlight into electric power while solar thermal changes sunlight into heat yet a PV/T system converts sunlight into heat and electricity simultaneously. The temperature of the PV module increases tremendously when light radiations of certain intensity fall on it, causing reduction in electrical efficiency. It is found that for every 1°C rise in temperature of PV surface, it will cause 0.4–0.5% decrement in its electrical efficiency.

PV/T system has gained greater attention in the last four decades because of its quality to generate both electric power/energy and thermal energy all the while and joins the electrical and thermal parts in one element over the conventional PV system and solar thermal system. The application areas of PV/T technology are space heating, water heating, drying, integration of photovoltaic thermal in buildings, etc. [1] (Fig. 1).

Exergetic Analysis of Glazed Photovoltaic Thermal (Single-Channel) Module Using Whale Optimization Algorithm and Genetic Algorithm

Sourav Diwania, Anmol Gupta, Anwar S. Siddiqui and Sanjay Agrawal

Abstract Photovoltaic thermal (PV-T) system gains greater attention in the last four decades because of its quality to produce both electrical and thermal energy simultaneously and unites the electrical and thermal components in a single unit over the conventional photovoltaic system and solar thermal system which are capable of producing electricity and thermal energy, respectively. There are various parameters which affects the performance of the PV-T system such as dimensions of the channel (duct), depth of the tedlar, thickness of insulation layer, solar cell fabrication technology, velocity of fluid flowing through the channel, temperature of the fluid at the inlet and outlet of the channel ,and cell temperature but in this paper, only four of the above parameters have been considered for optimization study. But in the proposed work, only four parameters such as air channel length (L_M), depth of the air duct (d), fluid velocity through the duct (V_F), and temperature of the air at the inlet of duct (T_{in}) have been considered for optimization using two dissimilar optimization algorithms such as whale optimization algorithm (WOA) and genetic algorithm (GA). The outcomes show that an improvement around 31.147% in exergy efficiency and 41.29% in thermal efficiency of glazed PV-T (single-channel) module is observed using WOA technique when compared with GA. Furthermore, WOA is better in contrast to GA because of faster rate of convergence in identifying the parameters.

Keywords Exergy efficiency · Photovoltaic thermal (PV-T) · Whale optimization algorithm (WOA)

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Effect of thermoelectric materials in electrical and thermal performance of photovoltaic thermal (PVT) collector

Anmol Gupta[1,2*], **Sanjay Agrawal**[3] **and Yash Pal**[1]

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Abstract. A photovoltaic integrated thermal (PVT) collector with thermoelectric material has been proposed in this communication, where a channel or duct has been used below the photovoltaic module in which air has been circulated to extract the heat taken by the photovoltaic module. Hence in PVT system, electrical energy from photovoltaic and thermal energy from duct are taken at the output. In this collector, thermoelectric (TE) is used to change the thermal energy by removing the waste heat of photovoltaic module into electric energy. In proposed PVT with thermoelectric system, TEs are generally appended at the back of the photovoltaic to improve the efficiency of PVT collectors. Thermal modelling has been presented for PVT collector with thermoelectric. The effect of thermoelectric material has been analysed for PVT collector. The electrical energy gain for photovoltaic collector and overall electrical energy gain with thermoelectric has been theoretically calculated. From the computed results, the overall electrical output is observed of PVT system with thermoelectric material; it is higher than only PVT system due to thermoelectric. As PVT system without thermoelectric generates only electrical energy due to PV and thermal energy but PVT system with thermoelectric generates electrical energy due to PV and thermoelectric both as well as thermal energy so overall exergy of PVT system with thermoelectric is higher than only PVT system. Hence PVT system with thermoelectric shows better results than only PVT system in respect of electrical, thermal and overall exergy gain.

Keywords: PVT collector, PVT collector with thermoelectric, thermal modelling, electrical gain, exergy gain

1. Introduction

Nowadays the renewable energy resources are very popular in terms of the energy generation process. As per the survey, the production of energy through the renewable sources was 9% in the year 2009 will be expected to grow 23% in 2035. Solar power plant is an important source of clean energy and generates a large amount of power in the present scenario. In solar photovoltaic, maximum of the incident sunlight is transformed into heat and only 15%-20% is changed into useful output electrical energy. The generated heat decreases its electrical efficiency as well as reduces the life time of PV module [1]. An integration of photovoltaic with thermal technology has been presented as photovoltaic thermal (PVT) system to use this waste heat. A channel or duct is applied below the PV panel in which air/water is applied to take the heat energy from the photovoltaic by conductive or convective process so as to improve the electrical performance of this hybrid system [2]. Hence both electrical and

Performance assessment of hybrid PVT air collector using GSA-CS algorithm

Sourav Diwania[1], **Anmol Gupta**[2, 3], **Anwar S Siddiqui**[1], **Sanjay Agrawal**[4], **Yash Pal**[2]

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Abstract. In the last few decades, enormous attention is drawn towards PV/T systems due to their advantages as compared to solar PV or solar thermal systems individually. In this proposed paper, hybrid Gravitational Search Algorithm (GSA)-Cuckoo Search (CS) has been implemented to optimize the parameters of glazed hybrid PVT air collector. Although there are various parameters which affects the thermal and electrical performance of PVT system but in this paper only four parameters namely Channel length below the PV panel, channel depth, velocity of fluid flowing through the channel and temperature of fluid at the inlet of the channel have been considered for optimization using the hybrid approach. The outcomes shows that GSA-CS algorithm is proved to be very efficient techniques to be used to optimized the parameters of hybrid PVT module. The result of the analysis shows that the average value of exergy efficiency is 14.8228% when the parameters are optimized using hybrid GSA-CS algorithm.

Key Words: Gravitational Search Algorithm; Cuckoo Search; PVT module

1. Introduction

The industrial reformation in the 18th century has tremendously hiked the energy demand globally. Around 14% of total energy consumption globally is provided by sustainable power sources [1]. Amongst all the available renewable energy sources, the solar PV has the highest capital cost, but due to its lower operational cost and maintenance [2], this technology is acknowledged around the world. Other advantages of solar PV are increased efficiency and pollution free energy [3]. The installed capacity of solar PV is increasing day by day worldwide due to its above-mentioned point of interests.

Experimental Validation & Performance Analysis of 100kW Solar Photovoltaic System

Publisher: IEEE

Akhilesh Rai ; Anmol Soni ; Anmol Gupta ; Ashish Thombre **All Authors**

Abstract: This paper focused on modelling & simulation of 100kW Solar Power Plant. In today's world as the demand of supply is increasing, a technology is needed to meet requiremen... **View more**

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Abstract:
This paper focused on modelling & simulation of 100kW Solar Power Plant. In today's world as the demand of supply is increasing, a technology is needed to meet requirements using renewable resources. The application of renewable energy in electrical power system is growing fast. Solar energy is the most clean, ample and endless of all the renewable energy resources till date. In this system, sunlight is harvested by using a technique like maximum power point technique (MPPT) to meet requirements without affecting the environment. In this paper, the development of PV array model & Simulink implementation with a mathematical model is discussed on MATLAB R2015a. This system is also connected to the grid to transfer the produced surplus energy. The effectiveness of power plant analysed by various characteristics.

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Solar power is the conversion of energy from the sun into electricity directly using photovoltaic (PV) system. Solar energy is intermittent due to day/night cycles and unpredictable weather conditions. To use this energy efficiently, an optimized system is introduced. As the output obtained from the system is in form of dc it can be used directly to run various loads but when dc power is converted into ac, the efficiency of a system gets reduced. In order to increase efficiency & the utilization of solar energy different models studied over the world on PV system [1]-[5].

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Keywords

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A Five–Level PWM Inverter for Hybrid PV/Fuel Cell/Battery Standalone Power System

Publisher: IEEE

Cite This PDF

Avinash Pareek ; Prashant Singh ; Anmol Gupta All Authors

Abstract: Renewable energy sources (RES) has found attention of power system researchers as alternate energy sources recently. On the other hand RES based generation has emerged as... **View more**

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Abstract:

Renewable energy sources (RES) has found attention of power system researchers as alternate energy sources recently. On the other hand RES based generation has emerged as one of the best option due to global environmental concerns, especially for off-grid load locations like islands, mountains, etc., where diesel generators are main source of power generation. This paper presents an efficient photovoltaic (PV) generation integrated with multilevel inverter to ensure regulated power at user end. In order to track the maximum power of PV applications Perturb and observe (PO) algorithm is used which is based on the maximum power point tracking (MPPT) principle. However in PV based power generation, control problems surfaces because of large variation in irradiance round the clock. This issue is controlled by hybrid PV

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generation system which is application of secondary power source as battery and fuel cell integrated with PV generation unit. The DC output of standalone hybrid PV-SOFC-Battery generation system is inverted by a single-phase multilevel converter. This output of developed standalone hybrid PV-SOFC-Battery generation system is used to supply the single-phase load. The results have been verified with MATLAB/Simulink for different load applications.

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R-peak based Arrhythmia Detection using Hilbert Transform and Principal Component Analysis

Publisher: IEEE

Cite This

PDF

Varun Gupta ; Monika Mittal All Authors

Abstract

The analysis of Electrocardiogram (ECG) signal is very cumbersome due to its non-stationary nature. ECG signal is the combination of P-wave, QRS-wave and T-wave. R-peaks detection is very important for classifying heart diseases in QRS-wave. R-peaks detection is not easy task due to the involvement of various types of noises and large length of data sets. In this work, discrete wavelet transform (DWT) is considered for preprocessing step. Hilbert transform has been used for spectral estimation for the step of extracting features. Finally, principal component analysis (PCA) is adopted for reducing feature vectors. R-peaks have been detected from reduced features on the basis of calculating the variance of principal components (PCs). The detection sensitivity (SE), positive predictivity (PP), F-measure (F-m) and mean squared error(MSE) are estimated for evaluating the performance of the proposed technique. It gave 99.88% SE, 99.88% PP, 99.88 % F-m, and 0.0796 MSE.

Metamaterial Inspired Dual Band Patch Antenna Array

Chirag Arorak . Shyam S. Pattnaik . R. N. Baral All Authors

Abstract:
This paper presents a shorted-pin, dual-band, metamaterial-loaded microstrip patch antenna array. Under the unloaded conditions, the traditional patch antenna array resonates at 5.8 GHz with gain of 9.8 dBi and bandwidth of 540 MHz. However, when each patch of this traditional array is loaded with split ring resonator (SRR) and a metallic via hole is made on the patch, the same antenna array also produces an additional resonant frequency in 2.45 GHz Wi-Fi band with bandwidth and gain of 290 MHz and 6.6 dBi, respectively, while the initial resonant frequency (i.e. 5.8 GHz) gets shifted to 5 GHz Wi-Fi band, providing the gain and bandwidth of 11.4 dBi and 510 MHz, respectively. The prototype of this proposed antenna array has been fabricated.

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ECG Signal Analysis: Past, Present and Future

Varun Gupta . Monika Mittal All Authors

Abstract:
Cardiovascular activity is a complicated process and the abnormality is directly represented in the ECG rhythm, heart rate, blood pressure and respiration signal. The Electrocardiogram (ECG) is an important tool for diagnosing the health status of the patient. It represents cardiac electrical activity of the patient. Analysis of this cardiac electrical signal is very challenging due to the involvement of various types of noise such as baseline wander noise, differences in the electrode impedances, power line interference, muscle artifact and the current flowing in the signal acquisition arrangement. For analyzing such cardiac electrical signal, it requires Computer aided diagnosis (CAD). Time domain techniques are suitable in the analysis of the clean ECG signal. Frequency domain techniques suffers due to spectral leakage. Hence, not suitable for analyzing nonlinear dynamics of the ECG signal. Nonlinear methods are used for analyzing such nonlinear and nonstationary features of the ECG signals. In this paper, different methods from time, frequency and nonlinear domains have been discussed.

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Smart Solar Energy Management to Power Computer Lab in Rural Areas

Publisher: IEEE

Neeraj Kumar Gupta ; Aditya Kumar Singh ; Ashish D. Thombre ; Kirti Pal **All Authors**

Abstract: An isolated solar PV system is a reliable solution to providing electricity in rural and remote locations. Such systems require an array of PV panels, charge controllers,... **View more**

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Abstract:

An isolated solar PV system is a reliable solution to providing electricity in rural and remote locations. Such systems require an array of PV panels, charge controllers, battery bank to compensate the supply & demand mismatch. The paper presents an evaluation of stand-alone photovoltaics (PV) system installed on the roof of EN Dept. building, KIET Group of Institutions, Ghaziabad. The experimental data was recorded for month of August 2018 through IoT. This project aims to encourage the use of small stand-alone solar PV system to supply power to laboratories in rural areas & remote locations. In this project we also develop a cost-effective energy management solution for data logging & monitoring is done by Wi-Fi based Internet of things (IoT) system that can be accessed from anywhere.

Keywords

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Footnotes

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Contents

Electricity plays a crucial role in the development of the society. It is a fundamental part of our life and one can't think of a world without electricity. Yet, over 1 billion people in the world do not have access to electricity. Of this, over 95% live in developing countries and over 84% reside in rural areas [1]. At the same time, we face the issue of depleting reserves & increasing cost of fossil fuels. Additionally, there is special focus on the major problems of Global Warming & pollution. These issues prompt us to reduce our dependence on fossil fuels as the primary source of energy. Due to this, the need of the hour is to develop and utilize renewable resources like solar, wind, geothermal, bioenergy& many more. Amongst these, solar energy is the one with the most potential. The approximate emission power from the sun is 1.8×10^{11} MW [2].

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SMALL SCALE POWER GENERATION FOR RURAL HOUSEHOLDS

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Abtract: This paper includes details about a project to build a human powered generator with the help of a bicycle. This can be used for upto 120watts DC. This project will help to develop a clean way of generating electricity. It is intended to be both achievable and affordable.

Keywords: portable generator, clean electricity, low cost power generation

I. INTRODUCTION

The purpose of this project is to build a human powered generator with the help of a bicycle which is also portable and can be used to power small appliances such as dc fans, light bulbs etc. This project will help to develop a clean way of generating electricity. It is intended to be both achievable and affordable. By using principles of energy conversation a small amount of power source can be developed which can be used in rural and remote areas. The chemical energy in a person's body is converted into mechanical energy using a bicycle and then further into the electrical energy with the motor. This energy is stored in a battery for further use.

II. LITERATURE REVIEW

[10] A remote village has limited access to electrical power and, as a result, the village homes are lit with candles and kerosene lamps after dark. Narrow mountain paths limit the access to neighbouring villages and limits the supply of diesel for the village's generators. The task is to develop a small and sustainable source of electricity for the village. [7] The intention is to create a system that can be used to generate and store enough energy to light an LED or any other small appliance for about 10

minutes.It is intended to be both achievable and affordable. [1] The chemical energy in a person's body is converted into mechanical energy with the use of bicycle and then further into the electrical energy with the motor. By hand-cranking the bicycle pedal at different speeds we will discover that at higher speeds the lamp will get brighter. We shall also discover that the sound emitted by the speaker gets higher in frequency and amplitude (volume) as the pedaling speed is increased. If the speaker or lamp has weak output, we will connect one at a time. An oscilloscope can also be connected to the dynamo to show the sinusoidal waveform. The loads provided should be appropriately matched to the dynamo's output. This energy can be measured by using a microcontroller and LCD display to display instantaneous power.

An Ultra Thin Body Nanoscale Dual Material Double Gate SOI MOSFET

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***Abstract*—In this paper, we compare the performance of symmetrical dual material double gate (SDMDG) SOI MOSFETs and asymmetrical dual material double gate (ADMDG) SOI MOSFETs. We investigate the influence of gate engineering on the analog performances of both the device structure for system-on-chip applications using a 2D device simulator (Silvaco TCAD). The gate engineering technique used here is the dual metal gate technology. The SDMDG structure shows better immunity to DIBL, near ideal Sub-threshold Slope (SS), high I_{on}/I_{off} ratio and improved analog performance like trans conductance generation factor, TGF (g_m/I_d), output conductance (g_d).**

***Keywords*— SDMDG, ADMDG, DIBL, trans conductance generation factor.**

I. INTRODUCTION

As the bulk MOSFET is scaled down, the control of short channel effects becomes increasingly difficult leading to increased sub-threshold leakage current.[1] This is because the source/drain influence over the channel potential becomes significant relative to the gate control. Advanced transistor structures such as the UTB and the DG-MOSFET eliminate sub-surface leakage paths and extend the scalability of Si CMOS technology.[2] In the DMDG SOI MOSFETs structure, the surface potential is characterized by a step function, due to this potential profile the drain voltage is screened, reducing the drain induced barrier lowering (DIBL). The step potential profile is achieved by the use of different gate materials.[3] The use of DMG also increases the carrier transport efficiency and in turn increases the I_{on} of the device.[4] In the DMDG MOSFETs structure, P^+ poly is close to the source end, named M1, and N^+ poly is close to the drain end, named M2. In conventional single metal gate device, the electric field near the source is lowest and reaches the peak value at the drain end. Due to this reason, the hot electron injection between the gate and drain makes the device unreliable, and reduces its lifetime. Thus, the primary intention is to keep the peak electric field under the gate, and not near the drain end, without degrading the Ion. Hence, DMDG architecture is implemented for which the carriers will be accelerated more rapidly and the hot electron injection problem is also avoided. This architecture will thus improve the average carrier velocity which in turn enhances the I_{on}. The improvement in I_{on} and DIBL suppression is achieved for lower work-function metal near the drain side (M1 > M2). [5-9]

In this paper, the parameters considered for the comparison between SDMDG and ADMDG SOI MOSFETs are drain induced barrier lowering (DIBL), the Sub-threshold Slope (SS), the I_{on}/I_{off} ratio, the threshold voltage (V_{th}), the trans conductance (g_m), the trans conductance generation factor (g_m/I_d) and the intrinsic gain (A_v). For ultralow-power, high gain analog/RF circuits, the gate oxide thickness, ($t_f = t_b = t_{ox}$) and the silicon body thickness, t_{si} are optimized with the help of ATLAS 2-D numerical device simulator and a comparison is performed between these devices.

The model used in the simulation are the inversion-layer Lombardi constant voltage and temperature (CVT) mobility model, that takes into account the effect of transverse fields, along with doping and temperature dependent parts of the mobility and the Shockley–Read–Hall (SRH) model simulates the leakage currents that exist due to thermal generation. The Gummel's method (or the decoupled method) which performs a Gummel iteration for Newton solution.

II. DEVICE STRUCTURE

Depending upon the way the gate material used, DMDG MOSFETs may be categorized as following:

A. Asymmetrical DMDG (ADMDG)

An asymmetric DMDG-MOSFET consist of front gate having P^+ poly and N^+ poly Si material contacting laterally whereas the back gate have N^+ poly Si material only. The device structure is shown below as:

Study and Analysis of Environmental Issues for Scaled Version of Si-Ge Heterojunction Bipolar Transistor

Publisher: IEEE

Alok Kumar Pandey ; Arun Kumar ; Sheetal Singh All Authors

Abstract: Nowadays Si-Ge HBTs are playing an important role in the field of RF and microwave applications. Also Scaling of a device is an advance fashion in the innovation. In this... **View more**

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Nowadays Si-Ge HBTs are playing an important role in the field of RF and microwave applications. Also Scaling of a device is an advance fashion in the innovation. In this paper, we have scaled the Si-Ge HBT using scaling techniques and studied the behavior of the RF performance parameters of the DUT before scaling and after scaling with Ge content in base region.

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A Qualitative Analysis of Secured Handover Management Schemes for Mobile IPv6 Enabled Networks

Publisher: IEEE

Arun Kumar Tripathi ; Surendra Kumar Tripathi **All Authors**

Abstract: Development in wireless technologies permits IPv6 enabled handheld mobile devices to access the Internet ubiquitously. An IP-address is required to identify the mobile ho... **View more**

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Abstract:

Development in wireless technologies permits IPv6 enabled handheld mobile devices to access the Internet ubiquitously. An IP-address is required to identify the mobile host on the Internet. Mobile IPv6 (MIPv6) scheme enables a mobile host to migrate from one subnet to another without changing its exiting IP-address. For IPv6 based mobility, Internet Engineering Task Force (IETF) proposed standard Mobile IPv6 as first mobility management scheme. It provides a powerful and flexible way to handle handover management. Standard MIPv6 is a host-based global mobility management scheme and endure from basic issues such as signaling overhead, handover latency and packet loss. Subsequently, IETF has standardized localized network-based Mobility Management schemes to overcome problems associated with global host-based

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mobility management schemes named as Proxy Mobile IPv6 (PMIPv6). It reduces handover latency and packet loss compared to host-based mobility management schemes considerably, yet, suffers from security issues. Later on, researchers proposed secured-PMIPv6 protocols for authentication of mobile as well as network devices within LMD. The paper reviews various handover management schemes for secure handover management. The performance of various schemes qualitatively investigated on vital parameters such as authentication cost, signaling cost, packetloss etc.

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Contents

Advancement in the field of mobile and wireless technology has affected our lives significantly and compelled us to shift from a fixed wired network to the wireless and mobile network. In the last decade, wireless technologies have increased 1000 fold in data rate approximately. Nowadays, wireless multifunctional terminals such as smart phones, laptops, personal digital assistants, navigation systems etc. have become part of our daily lives. These mobile terminals support a large number of multimedia applications such as social media applications, live video streaming, online games etc. To provide uninterrupted services to these devices, the volume is increasing exponentially day by day. Analysis by Computer Information System Company (CISCO), reveals that the mobile data traffic may grow up to 49 Exabytes per month by the year 2021, which is approximately seven times of the data traffic in 2016. In addition to this, the mobile data traffic may increase at a Compound Annual Growth Rate (CAGR) of 47% from year 2016 to year 2021 [1].

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Design of Multi-band Antenna

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Abstract:--

A new method for designing the multiband antenna is presented in this paper. In this method, two split ring slots with opposite gap facing is mounted on circular patch antenna. This configuration uses probe feeding technique along with RT duroid 5880 substrate. To create different short circuits along the slots the electric field is manipulated The resonance frequencies are chosen to increase the number of bands at which antenna can operate. Advance Design system 2011-10 is used for the simulation of this design. Results verify its multiband operation.

Keywords:--

Multiband, probe feed, patch antenna, resonant frequencies.

Space based solar power-a review

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[1,2,3,4]***Department of Electrical Engineering, KIET Group of Institutions, Ghaziabad-201206, India.***

Abstract

In the recent decades, there has been a huge energy demand due to the exponential increase of the human population and consequently, the depletion of non-renewable energy sources. This creates the need to explore alternate routes for renewable energy resources. The solar energy was the best alternative of the conventional energy system in last few decades, but because of intermittent energy and huge land area requirement it is the need of the hour to look for an alternate solar energy system. ***Space-based solar power (SBSP)*** *is a step towards this technology to overcome the limitation of intermittent supply as solar energy is always available in the space. SBSP is the concept of collecting* solar power *in* outer space *and distributing it to* Earth*. Potential advantages of collecting solar energy in space include a higher collection rate and a longer collection period due to the lack of a diffusing* atmosphere*, and the possibility of placing a solar collector in an orbiting location where there is no night.*

1. Introduction

Energy generation to meet the demand is a very big issue, and almost 10-15% of the total economic expenditures in the world are used for meeting this supply and demand [1]. The total resources which can be used for energy generation in the world can be broadly categorized into fossil fuels, renewable sources and nuclear resources. The fossil fuels and nuclear sources comes under the category of non-renewable sources further[2]out of these three sources of energy, fossil fuels are the conventional sources which are used to meet the major portion of the energy requirements in the world but they are depleting with time and also have adverse consequences such as global warming. Nuclear sources are also harmful for the living beings. This lead to shift towards renewable sources which is the best promising alternative of energy generation as compared with the above two categories of energy sources. The renewable energy source includes solar energy, wind energy, and hydel energy. Out of these solar energy was used and researched in last few decades, but because of its intermittent supply, it is not a very efficient energy generation system. So, the researchers thought to overcome this limitation by generating the energy directly in space where the availability of sunlight is always there using satellite and then transmit it to the earth. SBSP is an effort related to this initiative. Although the proposed system is in research state and not in use anywhere till now, but the researchers are targeting to achieve it till the end of 2025. In the present system which converts solar energy in to electrical energy, a considerable fraction of incoming solar energy (55–60%) is lost on its way through the Earth's atmosphere by the effects of reflection and absorption. But in Space-based solar power, the system convert sunlight to microwaves outside the atmosphere, avoiding these losses and the downtime due to the Earth's rotation, but at great cost due to the expense of launching material into orbit. SBSP is considered a form of sustainable or green energy, renewable energy, and is occasionally considered among climate engineering proposals. It is attractive to those seeking large-scale solutions to anthropogenic climate change or fossil fuel depletion (such as peak oil).

1.1 History

In 1941, science fiction writer Isaac Asimov published the science fiction short story "Reason", in which a space station transmits energy collected from the Sun to various planets using microwave beams. The SBSP concept, originally known as satellite solar-power system (SSPS), was first described in November 1968[6]. In 1973 Peter Glaser was granted U.S. patent number 3,781,647 for his method of transmitting power over long distances (e.g. from an SPS to Earth's surface) using microwaves from a very large antenna (up to one square kilometer) on the satellite to a much larger one, now known as a rectenna, on the ground[7]. Glaser then was a vice president at Arthur D. Little, Inc. NASA signed a contract with ADL to lead four other companies in a broader study in 1974. They found that, while the concept had several major problems – chiefly the expense of putting

A Study on Green Energy Powered Cognitive Radio Network for Communication Network Architecture of Smart Grid

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Abstract–High information rate applications in smart grid can incredibly increase energy consumption, which has incited to an emerging trend of addressing the *energy efficiency* aspect of communication technology. Green energy powered cognitive radio (Green-CR) network is important technology to meet the high information rate prerequisites as well as to improve spectrum and energy efficiency. However, designing Green-CR networks for smart grid is challenging as it requires not only the optimization of dynamic spectrum access but also the optimal utilization of green energy sources. In this paper, spectrum aware and energy efficient Green-CR network model is introduced to overcome spatio-temporally varying spectrum characteristics and harsh environmental conditions for smart grid applications. Subsequent to presenting fundamental outline standards potential advantages and network architecture of Green-CR, a multi layered approach with small cells for efficient design methodology is proposed to provide energy efficient CR network at the smart grid utility.

Keywords–green cognitive radio network, smart grid, energy harvesting, green communication.

I. INTRODUCTION

Wireless communication plays an imperative part in realizing all essential features of smart grid such as, efficiency, reliability, resilience, sustainability and security [1], as it can offer smart grid a much greater degree of freedoms for information accumulation, dissemination, and processing than wired communication infrastructure. With the unique features of dynamic spectrum access technique, CR networks have the potential to make best utilization of scarce spectrum and support increasing demand for wireless applications including smart grid.

CR networks are context-aware reconfigurable wireless networks consisting two frameworks: the primary user (PU) framework and the secondary user (SU) framework. PUs are licensed users i.e. the have selected benefit to get to the licensed bandwidth, while the SUs are the unlicensed users in cognitive radio, which can just get to the bandwidth that is not utilized by the PUs [2]. Proposed CR framework based communications infrastructure guarantees to use possibly all spectrum resources efficiently in the smart grid. The idea of applying CR technology to smart grid was first proposed by A. Ghassemi *et al.* [3] in which the authors proposed to utilize CR based IEEE 802.22 standard in wireless regional area networks (WRANs) for smart grid backhaul data streams.

Different from current CR systems powered by the reliable on-grid energy source, continuous advances in green energy motivated us to concentrate on green energy powered networks. On the off chance that the green energy source is ample and stable in the sense of accessibility, CR system can be powered to opportunistically exploit the underutilized spectrum by harnessing free energy without requiring energy supplement from external power grid or battery [4]. As the smart grid advances and develops, green power farms that harvest energy from green sources can substantially reduce carbon footprints. The need for adopting green communication has been realized worldwide. There is a focus on following holistic approach for power optimization. The next generation architectures focus on developing new technology, cell deployment strategies and resource allocation policies to improve the energy efficiency of a wireless communication network. Akshita et al [5] surveyed various techniques for power optimization of the next generation wireless networks. Further, [6] developed green communication model for next generation wireless networks, which considers both the access and backhaul network elements. So far, a green communication architecture for smart grid communication architecture has not been premeditated.

The aim of this paper is to offer a comprehensive review on the recent works on the applications of CR network technology in smart grid, based on which we want to show an evolutional path of smart grid development based on spectrum aware and energy efficient Green-CR networks.

The rest of this paper is outlined as takes after Section II expounds energy challenges in cognitive radio. Section III presents the Green-CR network technology in the smart grid communication infrastructure. In the same segment, energy efficient CR systems with small cells are additionally talked about. Step by step instructions to green energy utilization in the smart grid environment, is examined first, in which only the energy dynamics is considered. This will provide some insights for the information transmissions in the CR system. At that point, with the introduction of spectrum dynamics, the energy utilization is discussed in Green-CR networks. Section IV discusses system model for smart grid communication infrastructure, followed by the conclusion drawn in Section V.

II. COGNITIVE RADIO ENERGY CHALLENGES

A CR system must make real-time decisions on continuous choices about which spectrum hole to sense, when, and for what surviving. The detected range data must be adequately sufficient to achieve exact conclusions with respect to the radio environment. Besides, spectrum sensing must be quick so as to track the transient varieties of the radio environment. Such

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Contingency Analysis and Security Constraint based Optimal Power Flow in Power Network

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Deepak Yadav ; Aditya Singh Chauhan ; Brijesh Singh **All Authors**

Abstract: The objective of the present work is to observe the application of security constraint optimal power flow (SCOPF) technique in contingency management of power system. The... **View more**

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Abstract:

The objective of the present work is to observe the application of security constraint optimal power flow (SCOPF) technique in contingency management of power system. The contingency situations in power networks such as line outages and generation outages have been managed by using SCOPF solutions. The generation levels of various generators have been optimally rescheduled during contingent situation using SCOPF based load dispatch technique. In SCOPF, various other system constraints such as congestion, voltage deviation, and loss minimization have also been taken into account to achieve economic performance in the system. The interior point method (IPM) technique has been used to obtain the test results. The IPM based SCOPF methodology has been tested on an IEEE-9 bus system. The obtained test results show

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that the IPM based SCOPF technique provides efficient solutions for economic load dispatch in power network during normal and contingent situation of line and generation outages.

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Contents

The Power system is one of the leading fields where various operational activities have been involved, such as operational problems of a power system, security, reliability, and cost-effective load dispatch. One of the most challenging issues of modern power system infrastructure is analysis of contingency and optimal management methods. To insure a continuous power flow in power networks for meeting consumers' demand during contingency situations have also been a challenging task among the operators. The term, contingency analysis, is one of the most essential issue for establishing Power Management Systems (PMS) in power networks. The establishment of PMS in power networks is required advance analytical tools and algorithms for contingency analysis [1]. The objective is to provide a cost effective solution for power system operators. Mostly, the contingency situations raised because of generation and line outages [2]-[3]. In this situation, it is assumed that the system having capability to fulfill the power demands of the consumers through reserve capacities of the generators in the system. The rescheduling of generation is one of the usual practice adopted by the system operator [4]. Sometimes, the rescheduling decision making will be complex for the operators. Thus the optimal power flow (OPF) based system operation provide good solutions, especially during contingency [5]-[7].

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Disturbance Observer Based Robust Control Design of Variable Speed Wind Turbine

Publisher: IEEE

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Alok Kumar Pandey ; Bhanu Pratap ; Akhilesh Swarup All Authors

Abstract: This paper investigates the design of a robust control for two mass model (2-MM) of a variable speed wind turbine (VSWT). The VSWT is a class of nonlinear system with a h... **View more**

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This paper investigates the design of a robust control for two mass model (2-MM) of a variable speed wind turbine (VSWT). The VSWT is a class of nonlinear system with a high degree of uncertainty of irregular wind speed. The uncertain behaviour of wind speed is directly unmeasurable due to the high cost of sensors. Thus, the proposed control strategy is designed on the basis of disturbance observer which avoids the construction of inverse operator leads to the problem of singularity. The closed-loop 2-MM VSWT system stability is established as asymptotically stable. The simulation results reveal the performance and robustness of the proposed control algorithm for 2-MM VSWT system.

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Contents

Among various renewable energy sources, wind energy considers as the most promising source. It is supplying 3.7 % of global energy production and can be increased to 15%-18 % by 2050 as suggested by the international energy agency. Annual growth production of wind energy is 22 % from 2000 to 2015 [1], [2]. For maximum extraction of wind energy, it is necessary to maintain a constant rotational speed of the rotor. A control strategy is required to maintain rotor speed of variable speed wind turbine (VSWT) due to continuous change in the wind speed. However, a lot of challenges are still there like control of its dynamics, effective harvesting of energy and to maintain its robustness during irregularities that include velocity and direction of the wind so that it is infeasible to extract total power [3].

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Energy Conservation: Analysis & Improvement through Energy Audit

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***Abstract*— Energy generated from either conventional or non-conventional resources are generally not fully utilized in efficient way results in overconsumption, reduced energy efficiency & increased cost. Effective energy scheduling through energy audit results in smart & efficient energy consumption. Energy auditing had been conducted based on one year KWH consumption in KIET Group of Institutions Ghaziabad and various recommendations through this paper will be necessarily helpful for all educational buildings to minimize energy consumption & improving energy conservation.**

***Keywords*-- Energy audit, energy scheduling, energy consumption**

I. INTRODUCTION

Krishna Institute of Engineering and Technology (**KIET**) is a private engineering institute affiliated to Dr. A.P.J. Abdul Kalam Technical University, situated in Ghaziabad in the National Capital Region of India 30 km from Delhi. The institute is ISO certified and NBA accredited. The institute was started in 1998 under the aegis of the Krishna Charitable Trust. The institute has 8 academic departments, 3 boys hostels, 3 girls hostel, Auditorium, TBI, Central Library, a Multi-Purpose Complex with a focus on education in engineering, sciences, pharmacy and management. As on the date, the student strength of the institute is about **5341** with total faculty plus staff strength of about **529** and over an area of about **21** acre. The institute connected load is **1112 KVA** and annual electricity bill keeps up in several (**Cr)**. This huge electricity bill attracts the attention naturally. Making the institute energy efficient will not only concern with reduction in electricity expenses but also helps us to remind our moral responsibilities of not wasting this precious resource which may be used by people of the country in need**.**

A. Objective of the work

The objective of Energy Audit is to promote the idea of Energy Conservation in the Campus of KIET Ghaziabad. The purpose of the energy audit is to identify, quantify, describe and prioritize cost saving measures relating to energy use in the Hostels, Departments and Institute Central Facilities [3].

The work eligible for Energy Audit Study should be directed towards:

•Identification of areas of energy wastage and estimation of energy saving potential in Hostels, Departments and Central Facilities.

• Suggesting cost-effective measures to improve the efficiency of energy use.

• Estimation of implementation costs and payback periods for each recommended action.

• Documenting results & vital information generated through these activities.

•Identification of possible usages of co-generation, renewable sources of energy (say Solar Energy) and recommendations for implementation, wherever possible, with cost benefit analysis, and to reduce environmental effects.

B. Audit Methodology

The methodology adopted for this audit was a three step process comprising of:

1. Load Calculation & Testing of measuring devices In preliminary load calculation phase, exhaustive data collection was performed using different tools such as observation, interviewing key persons, and measurements. Power analyzer, lux meter used for this purpose is well tested by Lamp Load methods [14].

Following steps were taken for Load collection:

- The team walk through each department, center, hostel etc.
- Information about the general electrical appliances was collected by observation and interviewing.
- The power consumption of appliances was measured using power clamp meter.
- The details of usage of the appliances were collected by interviewing key persons e.g. Warden (in case of hostels), caretaker (in case of departments) etc.
- Light intensity was measured using lux meters at

978-1-5386-6472-8/18/$31.00 ©2018 IEEE

Simulation Modelling of DC-DC Converter for Grid Side Connected Inverter

Publisher: IEEE

Ranju Yadav ; Ankit Singhal ; Ashish. D. Thombre **All Authors**

Abstract: With the increasing demand of electrical energy, it became the necessity of human being and due to this its generation and utilization become one of the important concern... **View more**

Metadata

Abstract:
With the increasing demand of electrical energy, it became the necessity of human being and due to this its generation and utilization become one of the important concerns of the researchers, developers as well as for the industrialist. Different methodologies are achieved to harvest energy and convert it into required form with efficient use. In this paper a boost converter is used for the conversion of low DC voltage into high DC voltage with remodeled inverter and then voltage source inverter (VSI) synchronization to the grid is done. This paper consists of modeling of DC-DC converter for grid side connected inverter and presented the related output waveforms. Proposed circuit is simulated in MATLAB/SIMULINK 2013 and simulation results are provided.

More Like This

Published in: 2017 International Conference on Current Trends in Computer, Electrical, Electronics and Communication (CTCEEC)

Date of Conference: 8-9 Sept. 2017

Date Added to IEEE *Xplore*: 06 September 2018

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Conference Location: Mysore, India

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Simulation of Three Phase Voltage Source Inverter Based on SVPWM Technique

International Conference on Nano for Energy and Water

ICNEW 2017: Nanotechnology for Energy and Water pp 141-146 | Cite as

- Shivani Sachan (1) Email author (shivani.1421152@kiet.edu)
- Shivam Saway (1)
- Ankit Singhal (1)

1. Krishna Institute of Engineering and Technology, , Ghaziabad, India

Conference paper
First Online: 27 September 2017

Part of the Springer Proceedings in Energy book series (SPE)

Abstract

This paper presents simulation of two level voltage source inverter based on SVPWM (space vector pulse width modulation) technique. The concept of two level inverter is used to reduce the harmonic distortion in output voltage waveform without decreasing the inverter output power. Simulation results are presented to realize the validity of SVPWM technique.

Keywords

Voltage source inverter PWM SVPWM LCL filter with series damping resistor

References

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Improved Mathematical Modeling and Analysis of Photovoltaic Modules and Arrays

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***Abstract*—Solar Photovoltaic array is non-linear power source and under varying environmental conditions it is time consuming and extravagant to obtain operating characteristics. In order to overcome these restrictions an improved model of solar module/array has been proposed, this paper presents a step-by-step method for the simulation of SPV panels/arrays in MATLAB/Simulink. The governing curves of SPV array are also investigated for vast range of environmental conditions, substantial parameters and array configurations. The proposed method gives an exact decisive and easy to tune model of SPV array. Moreover, it provides an improved analysis of SPV array for various substantial parameters (series, parallel resistance, diode factor etc.) and environmental conditions (irradiance, temperature and partial shading) aspects.**

***Keyword*—photo-voltaic array, photo-generated current, solar irradiance, ambient temperature, single-diode model, series and parallel resistance**

I. INTRODUCTION

Solar power is a fast-growing industry in India and as of December 2016, the country's solar grid had a total capacity of 9 giga watts (GW). In January 2016, the Indian government expanded its solar plans to 100 GW of capacity, including 40 GW directly from solar rooftop, by 2022. The infinite, renewable, clean and noiseless nature of the solar energy makes it the most preferred sources of renewable energies which are increasingly finding application areas in today's human life [1]. However, despite of the mentioned advantages, this clean energy source has some disadvantages which should be overcome for an efficient use. High production costs of Photo Voltaic panels, less availability of efficient energy storage devices and dependency of energy production on the environmental conditions is some of the main issues which comes while production of solar energy[2,3,4].

The elemental entity responsible for the conversion of solar energy directly into electrical energy in a Solar Photo Voltaic (SPV) system is referred as SPV cell [6, 7]. The congregation of these SPV cells generally connected in series forms a SPV module. In order to get desired voltage level these modules are connected in series and to get desired current level modules are connected in parallel or surface area of each cell is increased. A SPV array can be a module or combination of modules in series and parallel configuration [8].

There are two ways to use output of SPV array 1) using DC output of array without any processing 2) using Power electronics converter for further processing of output power [16, 21]. The second method helps operates SPV array at optimal point by altering parameters at load side and controlling flow of power in grid connected system [4]. In order to study the performance of SPV system we require model that correctly stand for SPV cells, modules and arrays.

The main work in this paper is improved mathematical modeling of SPV cell/module/array and development of simulation model of module as well as array that correctly represents prevailing modules/array.

II. IDEAL PV CELL

When PV cell is exposed to light (photon), electrons are pushed out creating electron-hole pair in semiconductor material. If positive and negative terminals are connected to the conductors, having a closed electric network, constitutes photon generated current I_{Ph}. Therefore PV cell is PN

Energy Conservation: Analysis & Improvement through Energy Audit

Publisher: IEEE

Sudhir Kumar Singh ; Brajesh Kumar Tiwari ; Alok Kumar Pandey All Authors

Abstract: Energy generated from either conventional or non-conventional resources are generally not fully utilized in efficient way results in overconsumption, reduced energy effic... **View more**

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Abstract:
Energy generated from either conventional or non-conventional resources are generally not fully utilized in efficient way results in overconsumption, reduced energy efficiency & increased cost. Effective energy scheduling through energy audit results in smart & efficient energy consumption. Energy auditing had been conducted based on one year KWH consumption in KIET Group of Institutions Ghaziabad and various recommendations through this paper will be necessarily helpful for all educational buildings to minimize energy consumption & improving energy conservation.

Published in: 2018 3rd International Innovative Applications of Computational Intelligence on Power, Energy and Controls with their Impact on Humanity (CIPECH)

Metrics

More Like This

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Date Added to IEEE *Xplore*: 30 May 2019 **DOI:** 10.1109/CIPECH.2018.8724220

ISBN Information: **Publisher:** IEEE

Conference Location: Ghaziabad, India

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Contents

I. INTRODUCTION

Krishna Institute of Engineering and Technology (KIET) is a private engineering institute affiliated to Dr. A.P.J. Abdul Kalam Technical University, situated in Ghaziabad in the National Capital Region of India 30 km from Delhi. The institute is ISO certified and NBA accredited. The institute was started in 1998 under the aegis of the Krishna Charitable Trust. The institute has 8 academic departments, 3 boys hostels, 3 girls hostel, Auditorium, TBI, Central Library, a Multi-Purpose Complex with a focus on education in engineering, sciences, pharmacy and management. As on the date, the student strength of the institute is about 5341 with total faculty plus staff strength of about 529 and over an area of about 21 acre. The institute connected load is 1112 KVA and annual electricity bill keeps up in several (Cr). This huge electricity bill attracts the attention naturally. Making the institute energy efficient will not only concern with reduction in electricity expenses but also helps us to remind our moral responsibilities of not wasting this precious resource which may be used by people of the country in need.

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Figures

References

Keywords

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A Bibliographical View on Research and Developments of Photovoltaic and Thermal Technologies as a Combined System: PV/T System

Anmol Gupta, Sourav Diwania, Sanjay Agrawal, Anwar S. Siddiqui and Yash Pal

Abstract In this hybrid photovoltaic thermal (PV/T) system, air or water is utilized as a circulating fluid which helps in maintaining electrical efficiency as well as utilization of thermal energy (space heating, crop drying, etc.) at the output. In this article, a review of innovative work in the field of PV/T system and thermal modelling of PV/T collector is presented. The thermal model having different equations for PV-integrated flat plate collector, energy balance for air or water heating system stored thermal energy, the instantaneous energy efficiency and the instantaneous exergy efficiency has been presented. Analytical articulations for different thermal parameters and electrical parameters, considering energy balance for several segments or components of PV/T collector is obtained. Various optimization techniques used in the field of PV/T collector, in view of the exergy concept is also presented.

Keywords Exergy efficiency · Photovoltaic thermal · Optimization · Genetic algorithm

NOMENCLATURE

α_t	Absorptivity of glass
b	Width of PV/T collector (m)
L	Length of PV/T collector (m)
dx	Small length (m)

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A. Kalam et al. (eds.), *Intelligent Computing Techniques for Smart Energy Systems*,
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Exergetic Analysis of Glazed Photovoltaic Thermal (Single-Channel) Module Using Whale Optimization Algorithm and Genetic Algorithm

Sourav Diwania, Anmol Gupta, Anwar S. Siddiqui and Sanjay Agrawal

Abstract Photovoltaic thermal (PV-T) system gains greater attention in the last four decades because of its quality to produce both electrical and thermal energy simultaneously and unites the electrical and thermal components in a single unit over the conventional photovoltaic system and solar thermal system which are capable of producing electricity and thermal energy, respectively. There are various parameters which affects the performance of the PV-T system such as dimensions of the channel (duct), depth of the tedlar, thickness of insulation layer, solar cell fabrication technology, velocity of fluid flowing through the channel, temperature of the fluid at the inlet and outlet of the channel ,and cell temperature but in this paper, only four of the above parameters have been considered for optimization study. But in the proposed work, only four parameters such as air channel length (L_M), depth of the air duct (d), fluid velocity through the duct (V_F), and temperature of the air at the inlet of duct (T_{in}) have been considered for optimization using two dissimilar optimization algorithms such as whale optimization algorithm (WOA) and genetic algorithm (GA). The outcomes show that an improvement around 31.147% in exergy efficiency and 41.29% in thermal efficiency of glazed PV-T (single-channel) module is observed using WOA technique when compared with GA. Furthermore, WOA is better in contrast to GA because of faster rate of convergence in identifying the parameters.

Keywords Exergy efficiency · Photovoltaic thermal (PV-T) · Whale optimization algorithm (WOA)

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Effect of thermoelectric materials in electrical and thermal performance of photovoltaic thermal (PVT) collector

Anmol Gupta[1,2*], **Sanjay Agrawal**[3] **and Yash Pal**[1]

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[3]SOET, IGNOU, New Delhi, 110068, India
* Corresponding author email: anmol.engg@gmail.com

Abstract. A photovoltaic integrated thermal (PVT) collector with thermoelectric material has been proposed in this communication, where a channel or duct has been used below the photovoltaic module in which air has been circulated to extract the heat taken by the photovoltaic module. Hence in PVT system, electrical energy from photovoltaic and thermal energy from duct are taken at the output. In this collector, thermoelectric (TE) is used to change the thermal energy by removing the waste heat of photovoltaic module into electric energy. In proposed PVT with thermoelectric system, TEs are generally appended at the back of the photovoltaic to improve the efficiency of PVT collectors. Thermal modelling has been presented for PVT collector with thermoelectric. The effect of thermoelectric material has been analysed for PVT collector. The electrical energy gain for photovoltaic collector and overall electrical energy gain with thermoelectric has been theoretically calculated. From the computed results, the overall electrical output is observed of PVT system with thermoelectric material; it is higher than only PVT system due to thermoelectric. As PVT system without thermoelectric generates only electrical energy due to PV and thermal energy but PVT system with thermoelectric generates electrical energy due to PV and thermoelectric both as well as thermal energy so overall exergy of PVT system with thermoelectric is higher than only PVT system. Hence PVT system with thermoelectric shows better results than only PVT system in respect of electrical, thermal and overall exergy gain.

Keywords: PVT collector, PVT collector with thermoelectric, thermal modelling, electrical gain, exergy gain

1. Introduction

Nowadays the renewable energy resources are very popular in terms of the energy generation process. As per the survey, the production of energy through the renewable sources was 9% in the year 2009 will be expected to grow 23% in 2035. Solar power plant is an important source of clean energy and generates a large amount of power in the present scenario. In solar photovoltaic, maximum of the incident sunlight is transformed into heat and only 15%-20% is changed into useful output electrical energy. The generated heat decreases its electrical efficiency as well as reduces the life time of PV module [1]. An integration of photovoltaic with thermal technology has been presented as photovoltaic thermal (PVT) system to use this waste heat. A channel or duct is applied below the PV panel in which air/water is applied to take the heat energy from the photovoltaic by conductive or convective process so as to improve the electrical performance of this hybrid system [2]. Hence both electrical and

Performance assessment of hybrid PVT air collector using GSA-CS algorithm

Sourav Diwania[1], **Anmol Gupta**[2, 3], **Anwar S Siddiqui**[1], **Sanjay Agrawal**[4], **Yash Pal**[2]

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Abstract. In the last few decades, enormous attention is drawn towards PV/T systems due to their advantages as compared to solar PV or solar thermal systems individually. In this proposed paper, hybrid Gravitational Search Algorithm (GSA)-Cuckoo Search (CS) has been implemented to optimize the parameters of glazed hybrid PVT air collector. Although there are various parameters which affects the thermal and electrical performance of PVT system but in this paper only four parameters namely Channel length below the PV panel, channel depth, velocity of fluid flowing through the channel and temperature of fluid at the inlet of the channel have been considered for optimization using the hybrid approach. The outcomes shows that GSA-CS algorithm is proved to be very efficient techniques to be used to optimized the parameters of hybrid PVT module. The result of the analysis shows that the average value of exergy efficiency is 14.8228% when the parameters are optimized using hybrid GSA-CS algorithm.

Key Words: Gravitational Search Algorithm; Cuckoo Search; PVT module

1. Introduction

The industrial reformation in the 18th century has tremendously hiked the energy demand globally. Around 14% of total energy consumption globally is provided by sustainable power sources [1]. Amongst all the available renewable energy sources, the solar PV has the highest capital cost, but due to its lower operational cost and maintenance [2], this technology is acknowledged around the world. Other advantages of solar PV are increased efficiency and pollution free energy [3]. The installed capacity of solar PV is increasing day by day worldwide due to its above-mentioned point of interests.

Experimental Validation & Performance Analysis of 100kW Solar Photovoltaic System

Publisher: IEEE

Akhilesh Rai ; Anmol Soni ; Anmol Gupta ; Ashish Thombre **All Authors**

Abstract: This paper focused on modelling & simulation of 100kW Solar Power Plant. In today's world as the demand of supply is increasing, a technology is needed to meet requiremen... **View more**

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Abstract:
This paper focused on modelling & simulation of 100kW Solar Power Plant. In today's world as the demand of supply is increasing, a technology is needed to meet requirements using renewable resources. The application of renewable energy in electrical power system is growing fast. Solar energy is the most clean, ample and endless of all the renewable energy resources till date. In this system, sunlight is harvested by using a technique like maximum power point technique (MPPT) to meet requirements without affecting the environment. In this paper, the development of PV array model & Simulink implementation with a mathematical model is discussed on MATLAB R2015a. This system is also connected to the grid to transfer the produced surplus energy. The effectiveness of power plant analysed by various characteristics.

Secured Biometric Template Matching by Using Linear Discriminant Analysis

International Conference on Hybrid Intelligent Systems

HIS 2017: Hybrid Intelligent Systems pp 194-203 | Cite as

Conference paper

First Online: 16 March 2018

Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 734)

Systems and Computing, vol 734. Springer, Cham. https://doi.org/10.1007/978-3-319-76351-4_20

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DOI

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Publisher Name

Springer, Cham

Print ISBN

978-3-319-76350-7

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Cognitive Radio Networks: A Comprehensive Review

Nitin Gupta (Netaji Subhas Institute of Technology, India), Sanjay Kumar Dhurandher (Netaji Subhas Institute of Technology, India) and Bhoopendra Kumar (KIET Group of Institutions, India)

Source Title: Handbook of Research on the IoT, Cloud Computing, and Wireless Network Optimization (/book/handbook-research-iot-cloud-computing/206185)

Pages: 28

DOI: 10.4018/978-1-5225-7335-7.ch021

The radio spectrum is witnessing a major paradigm shift from fixed spectrum assignment policy to the dynamic spectrum access, which will completely change the way radio spectrum is managed. This step is required to greatly reduce the load on limited spectrum resources, which is being enforced by the exponential growth of wireless services. This is only feasible due to the capabilities of the cognitive radio, which will provide a new paradigm in wireless communication by exploiting the existing unused spectrum bands opportunistically. The chapter provides insight into recent developments in the area of cognitive radio networks with the main focus on review of the spectrum management, which consists of four main challenges: sensing of selected spectrum band, decision about sensed spectrum, sharing of spectrum among many users, and spectrum handoff. Further, sharing of target channel after a channel handoff is analyzed using game theory to get a different perspective on the existing medium access techniques.

A Robust Framework for Effective Human Activity Analysis

International Conference on Innovative Computing and Communications pp 331-337

| Cite as

Conference paper

First Online: 20 November 2018

Part of the Lecture Notes in Networks and Systems book series (LNNS, volume 56)

Abstract

First Online

20 November 2018

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https://doi.org/10.1007/978-981-13-2354-6_35

Publisher Name

Springer, Singapore

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978-981-13-2353-9

Online ISBN

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Intelligent Technologies and Robotics
Intelligent Technologies and Robotics (R0)

Contract Theory Based Incentive Mechanism Design Approaches in Cognitive Radio Networks: A Survey

Publisher: IEEE

Nitin Gupta ; Sanjay Kumar Dhurandher ; Bhoopendra Kumar **All Authors**

Abstract: Through the previous decade, an ever increasing demand of wireless radio spectrum has been observed due to expeditious use of various wireless applications and devices. H... **View more**

Metadata

Abstract:

Through the previous decade, an ever increasing demand of wireless radio spectrum has been observed due to expeditious use of various wireless applications and devices. However, current fixed radio spectrum policy holds up the efficient use of radio spectrum due to which large part of the spectrum remain under-utilized. This requires a complete

Published in: 2019 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU)

Date of Conference: 18-19 April 2019 **INSPEC Accession Number:** 18869000

Date Added to IEEE *Xplore*: 29 July 2019 **DOI:** 10.1109/IoT-SIU.2019.8777498

ISBN Information: **Publisher:** IEEE

Conference Location: Ghaziabad, India

Contents

The unprecedented essential technological revolutions in the area of wireless communications that we are witnessing today is majorly due to the radio spectrum and, also make a positive impact on the economic growth of a country [1], [2]. The advancement in wireless technology has allowed seamless connectivity across various wireless devices. The enhanced Quality of Experience and Quality of Service provided by the service providers has seen exponential growth in mobile data traffic and it is predicted that by 2020, there will be approximately ten times increase in the data traffic globally as compared to the year 2015 [3], [4]. Therefore, it has now become exceedingly hard to meet the increasing spectrum re-quirment through the current fixed spectrum assignment policy where spectrum channels are particularly used by licensed users only for the exclusive applications which also led to wastage of a considerable spectrum channels like TV bands [5]. Practically it is not possible to obtain new frequency bands from the already inadequate spectrum resources to enhance overall capacity of the wireless system. This fact has inspired the development of various wireless technologies, like exposure of millimeter wave spectrum [6], femtocells [7], [8], multi-input multi-output systems (MIMO) [9], and dynamic spectrum access with the help of cognitive radio technology [10]. To address these challenges, the “Federal Communications Commission (FCC)” has recently proposed to allow interference less use of the licensed spectrum to the primary license holders by the unlicensed users [11]. By making dynamic spectrum access possible with the help of cognitive radio, FCC has intended to achieve the solution to this problem [12]. Next,

Quantitative structure-activity relationship (QSAR) is an important drug design approach to understand the relationship between the chemical structure and their biological activity. The book describes brief introduction to hepatitis C virus (HCV), life cycle, identified targets and current progress towards development of anti-HCV agents. 2D and 3D-QSAR studies for anti-HCV compounds from different categories targeting NS5B polymerase have been incorporated. Some of the selected categories are nucleoside and non-nucleosides.

Dr. Vaishali M. Patil has academic and industry experience of 15 years. Her research interests are synthetic chemistry, computational chemistry, QSAR and their application for drug discovery. She has excellent research publications and some reviews to her credit in esteemed journals and few chapters in Elsevier, Nova, and Springer published books.

Vaishali M Patil
Satya Prakash Gupta
Neeraj Masand

Hepatitis C Virus: QSAR Studies on Polymerase Inhibitors

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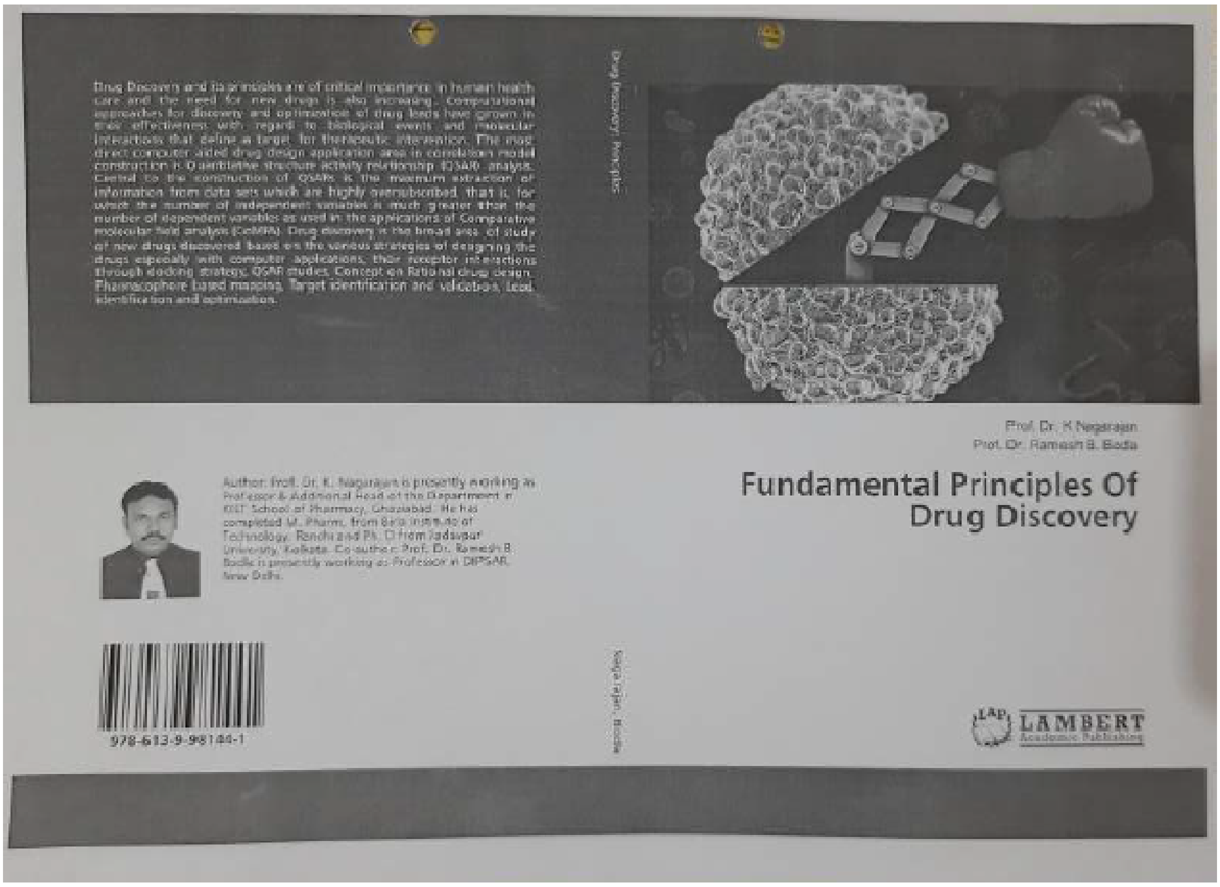
Prof. Dr. K Nagarajan
Prof. Dr. Ramesh B. Bodla
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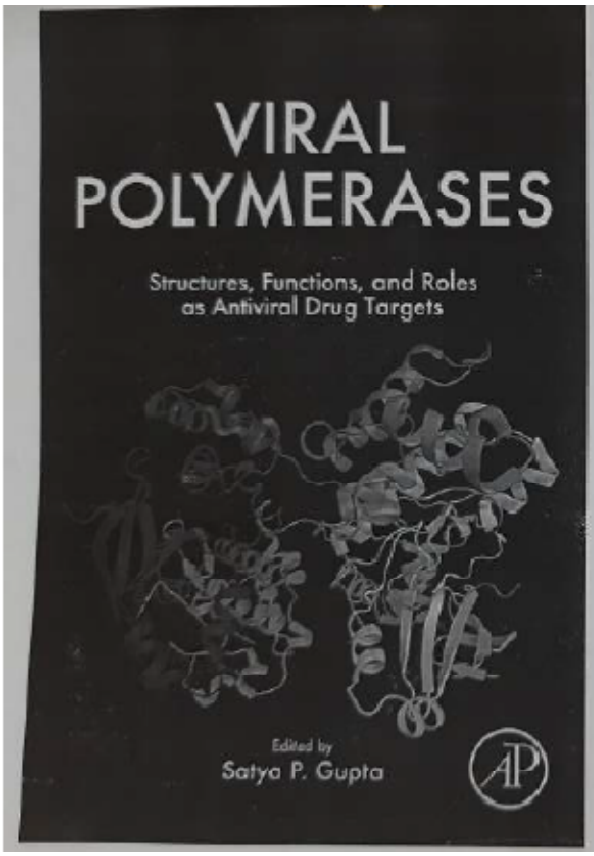
978-613-9-98144-1
Author: Prof. Dr. K. Nagarajan is presently working as Professor & Additional Head of the Department in KIET School of Pharmacy, Ghaziabad. He has completed M. Pharm. from Birla Institute of Technology, Ranchi and Ph. D from Jadavpur University, Kolkata. Co-author: Prof. Dr. Ramesh B. Bodla is presently working as Professor in DIPSAR, New Delhi.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Edited by
Satya P. Gupta
AP

Viral Polymerases
Structures, Functions and Roles as Antiviral Drug Targets
2019, Pages 387-428

Chapter 14 - Dengue Virus Polymerase: A Crucial Target for Antiviral Drug Discovery

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Available online 2 November 2018

Abstract

The dengue virus (DENV) is the most prevalent mosquito-borne viral pathogen. Four DENV serotypes have been identified and majority of them are developed into life-threatening dengue hemorrhage fever (DHF) and dengue shock syndrome (DSS). It is a growing global health concern and requires specific antiviral drugs and vaccines. DENV NS5 protein is comprised of N-terminal methyltransferase (MTase) and a C-terminal RNA-dependent RNA polymerase (RdRP) domain. They catalyze 5′-RNA capping/methylation and RNA synthesis during viral genome replication. The reported X-ray structures of NS5 suggest coordinated activity of MTase and NS5 residues as a dimer during viral genome replication. Some insights into the dynamics and mechanism of DENV entry and infectivity through atomistic-level modeling and molecular dynamics, identifying key amino acids and regions that facilitate entry and fusion of DENV into cell membrane have been summarized. Direct evidence support the hypothesis for the presence of allosteric pockets as target for antiviral drug development. An overview of the target-based approaches to develop therapeutics against DENV infection is presented that may be helpful in screening and development of inhibitors directed against the DENV polymerase.

Previous Next

Keywords

Falviviridae; DENV RdRP; nucleoside inhibitors; nonnucleoside inhibitors; atomistic-level modeling; molecular dynamics

VIRAL POLYMERASES

Structures, Functions, and Roles as Antiviral Drug Targets

Edited by

Satya P. Gupta

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VIRAL POLYMERASES

Viral Polymerases
Structures, Functions and Roles as Antiviral Drug Targets
2019, Pages 357-385

Chapter 13 - Zika Virus Polymerase: Structure, Function, and Inhibitors

Vaishali M. Patil [a], Neeraj Masand [b], Satya P. Gupta [c]

[a] Department of Pharmaceutical Chemistry, KIET School of Pharmacy, KIET Group of Institutions, Ghaziabad, Uttar Pradesh, India
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Available online 2 November 2018.

Abstract

Among the human infections transmitted by mosquito, Zika virus (ZIKV) infection has potential as worldwide pandemic. ZIKV infection can spread from person to person vertically from mother to fetus or through sexual contact and thus differs from other pathogenic flaviviruses. ZIKV infection is asymptomatic and has been strongly associated with neurological sequelae (Guillain–Barre syndrome), meningoencephalitis, and myelitis. During pregnancy ZIKV infection may cause dreaded complications leading to fetal abnormalities and death. Currently no specific therapies or vaccines are approved for prevention and treatment of ZIKV infection. ZIKV structure has been revealed that shows remarkable similarities with those of other flaviviruses. Inhibition of viral MT activity and/or RNA synthesis can be developed for inhibiting ZIKV replication. Various ZIKV proteins complexed with inhibitors could aid in accelerating the drug discovery process. The consequences of ZIKV mutations suggest the urgent need for viral inhibitors with higher specificity and potency. Rationalized approaches are fundamental in the discovery of potent inhibitors to mask the virus as well as its destruction. The advent of in silico drug design allows rapid screening of potential leads and reduces the consumption of time and resources. Various optimized and proven screening techniques and their results in the discovery of potential inhibitors of ZIKV methyltransferase (MTase) and RNA-dependent RNA polymerase (RdRP) have been elaborated.

Previous Next

Keywords

Zika virus; flavivirus; protein-structure function; ZIKV polymerase; nucleoside analogs

(19)

VIRAL POLYMERASES

Structures, Functions, and Roles as Antiviral Drug Targets

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VIRAL POLYMERASES

Studies in Natural Products Chemistry
Volume 59, 2018, Pages 401-436

Chapter 12 - Anticancer Potential of Flavonoids: Chemistry, Biological Activities, and Future Perspectives

Vaibhavi M. Patil [a], Neeraj Masand [b]

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[b] Department of Pharmacy, Lala Lajpat Rai Memorial Medical College, Meerut, Uttar Pradesh, India

Available online 30 August 2018.

Abstract

The polyphenolic flavonoids are found ubiquitously in plants. Flavonoids are nontoxic and possess a remarkable spectrum of biological activities such as antiallergic, antiinflammatory, antioxidant, antimutagenic, anticarcinogenic, and modulation of enzymatic activities. Some of the reported flavonoids are able to influence the deregulated processes during cancer development. Thus, flavonoids have beneficial effects on health and have the potential for the development of possible chemoprotective therapeutic agents for the treatment of cancer. Some dietary flavonoids have antitumor activity during in vivo studies and also repress angiogenesis. In vitro studies conclude the potential of flavonoid-induced modulation of kinases with apoptosis, vascularization, cell differentiation, cell proliferation, etc. The results obtained from the laboratory and epidemiological studies have confirmed the potential of flavonoids and have stimulated the development of flavonoids. Most of the available chemotherapeutic agents have a major obstacle as they do not spare normal cells and the development of multidrug resistance. The promising results stimulate the development of flavonoids and their synthetic analogs for cancer prevention and chemotherapy. This chapter covers the structural characteristics of flavonoids, their role in cancer treatment and prevention in in vitro cell lines and in vivo murine models, and the human clinical trials.

Keywords

Anticancer agents; Flavonoids; Mechanism of action; Flavonoid subclasses

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July, 2018

Ankit Mittal
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Mathematical Aspects & IVIVC Development of Extended Release Products

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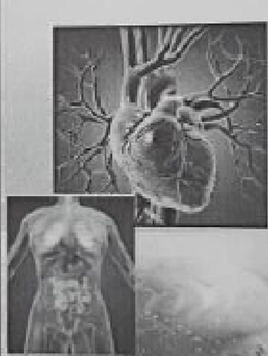

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Ms. Monika Bhardwaj working as Assistant Professor, Department of Pharmacology, KIET School of Pharmacy, Ghaziabad. She has completed her B. Pharm. degree from KIET School of Pharmacy, Ghaziabad and secures 8th rank among all colleges of UPTU, Lucknow. She has completed her M. Pharm. degree from Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow. She is meritorious student in Undergraduate and Post Graduation as well. She has qualified GPAT (twice) and awarded with various Scholarships/Fellowships. She has published many research papers in national and international journals and has attended many national and International conferences and workshops.

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Basic Understanding of Human Anatomy & Physiology RNPD P1001

Basic Understanding of HUMAN ANATOMY & PHYSIOLOGY

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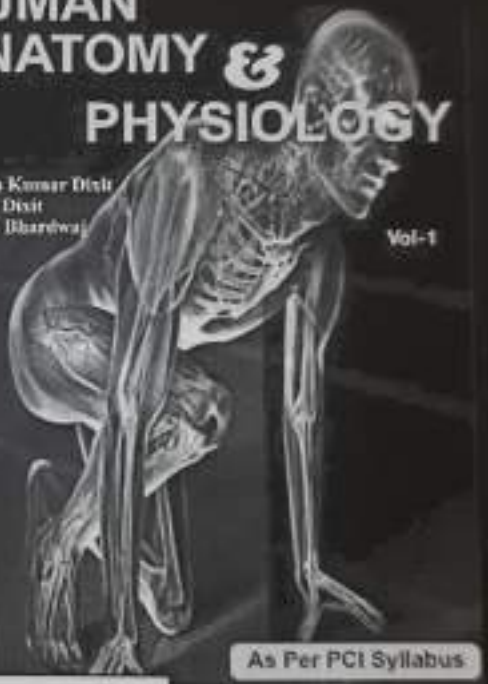

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XBee and Internet of Robotic Things Based Worker Safety in Construction Sites

Rajesh Singh, Anita Gehlot, Divyanshu Gupta, Geeta Rana, Ravindra Sharma, and Shivani Agarwal

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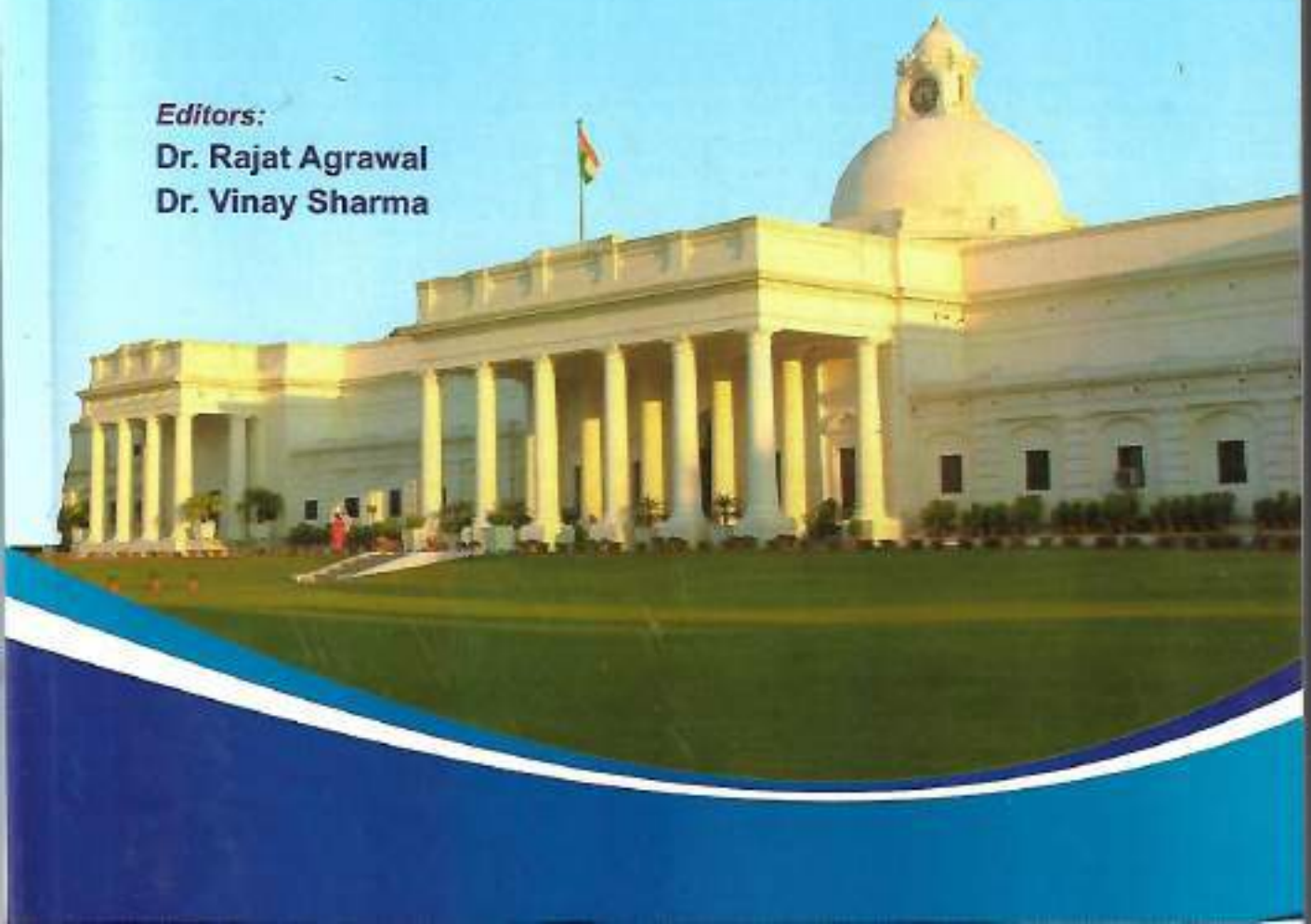

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ROLE OF TECHNOLOGY BUSINESS INCUBATORS (TBIs) IN SETTING UP OF STARTUPs: A STUDY OF TBI-KIET, GHAZIABAD

Deepa[1], Prateek Gupta[2]
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ABSTRACT

The development of India depends on the technological development of the nation. The technical Startups are boon in this endeavor. These startups are considered to be a solution for generating capital, creating employment and launching new products and services through unique ideas. Hence developing the spirit of entrepreneurship among the young has become vital. In encouraging entrepreneurship in academic institutions, seeking leadership with these characteristics is essential. The need for Academic Technology Business Incubators (TBIs) has been recognized the world over for initiating technology led and knowledge driven enterprises. In this paper, it is intended to analyze the need and role of TBIs in development of India especially for TBI-KIET.

Keywords: Entrepreneurship, Startups, Academic TBIs, Entrepreneurial education, TBI-KIET.

INTRODUCTION

The requirement for TBI has been documented the world over for initiating technology driven and knowledge driven organizations. Past crams also show that such incubators help not only in the growth of technology based new enterprises but also in improving their endurance rate to a large extent i.e. upto 40 percent (earlier 30 per cent to over 70 per cent[a]). The TBIs besides providing a host of services to new enterprises (and also to existing SMEs in the region) also facilitate an environment affable for their survival and growth. The indispensable feature of a TBI is that the tenant companies leave the incubator space within 2-3 years. TBIs also make easy, speedy commercialization of research outputs[b]. There are nearly 4000 incubators of various categories operational in the World. In USA, there are more than 1000 incubators including about 200 Internet incubators. Europe has nearly 1000 incubators including 300 in Germany. Among the developing countries, China has shown exponential growth in the incubators and over a period of ten years has set up almost 400 incubators. Korea too, is reported to have about 300 Incubators, while Japan, Malaysia and Singapore are catching up it in speed. High-technology incubators have been particularly successful in U.S., Israel, and China. In Central and Eastern Europe, where entrepreneurial movements have traditionally been very low, incubators are sought to play an important role in instigating entrepreneurial activities[c]. In the developing economies like India, each TBI evolves its model based on the need, its strength and the thrust area of the technology. The TBI model usually provides the following:

- Assist in preparation of business plans.

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[a] http://www.nstedb.com
[b] http://www.nstedb.com/institutional/tbi.htm
[c] http://www.fao.org/docrep/W6882e/w6882e02.htm

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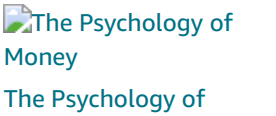

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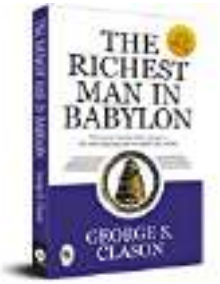

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A Qualitative Analysis of Secured Handover Management Schemes for Mobile IPv6 Enabled Networks

Publisher: IEEE

Arun Kumar Tripathi ; Surendra Kumar Tripathi **All Authors**

Abstract: Development in wireless technologies permits IPv6 enabled handheld mobile devices to access the Internet ubiquitously. An IP-address is required to identify the mobile ho... **View more**

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Abstract:

Development in wireless technologies permits IPv6 enabled handheld mobile devices to access the Internet ubiquitously. An IP-address is required to identify the mobile host on the Internet. Mobile IPv6 (MIPv6) scheme enables a mobile host to migrate from one subnet to another without changing its exiting IP-address. For IPv6 based mobility, Internet Engineering Task Force (IETF) proposed standard Mobile IPv6 as first mobility management scheme. It provides a powerful and flexible way to handle handover management. Standard MIPv6 is a host-based global mobility management scheme and endure from basic issues such as signaling overhead, handover latency and packet loss. Subsequently, IETF has standardized localized network-based Mobility Management schemes to overcome problems associated with global host-based mobility management schemes named as Proxy Mobile IPv6 (PMIPv6). It reduces handover latency and packet loss compared to host-based mobility management schemes considerably, yet, suffers from security issues. Later on, researchers proposed secured-PMIPv6 protocols for authentication of mobile as well as network devices within

Automating Outcome Based Education for the Attainment of Course and Program Outcomes

Publisher: IEEE

Akash Rajak ; Ajay Kumar Shrivastava ; Divya Prakash Shrivastava **All Authors**

Abstract: Outcome Based Education is implemented in engineering colleges of India as per the guidelines issued by AICTE. It is a model which measures the performance of program on ... **View more**

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Outcome Based Education is implemented in engineering colleges of India as per the guidelines issued by AICTE. It is a model which measures the performance of program on the basis of outcomes. The model can be used in evaluating the Program Educational Objectives and Program Outcomes. The paper discusses Outcome Based Education model and the attainments. We will discuss the process for the attainments of Program Outcomes and Program Educational Objectives for Undergraduate or Postgraduate program approved by AICTE, India. The attainment summary can be generated Batch wise and thus would help in comparing attainments of difference Batches.

Published in: 2018 Fifth HCT Information Technology Trends (ITT)

Date of Conference: 28-29 Nov. 2018 **INSPEC Accession Number:** 18474246

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Detection of Tuberculosis based on Multiple Parameters using ANFIS

Publisher: IEEE

Ajay Kumar Shrivastava ; Akash Rajak ; Shashank Bhardwaj All Authors

Abstract: Tuberculosis is being a big disease in the world due to which large numbers o deaths occur. Adaptive Neuro Fuzzy Inference System (ANFIS), which is a type of hybrid of n... **View more**

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Abstract:
Tuberculosis is being a big disease in the world due to which large numbers of deaths occur. Adaptive Neuro Fuzzy Inference System (ANFIS), which is a type of hybrid of neural network and fuzzy logic and is based on fuzzy inference system, has been presented in this paper for an intelligent system for a simulation for the disease which will be helpful for diagnosing the stages of the pulmonary tuberculosis based on various input parameters.

Published in: 2018 3rd International Innovative Applications of Computational Intelligence on Power, Energy and Controls with their Impact on Humanity (CIPECH)

Date of Conference: 1-2 Nov. 2018 **INSPEC Accession Number:** 18723670

Date Added to IEEE *Xplore*: 30 May 2019 **DOI:** 10.1109/CIPECH.2018.8724255

Onboard Data Acquisition System to Monitor the Vehicle

Ambient Communications and Computer Systems pp 265-271 | Cite as

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1. KIET Group of Institutions, , Ghaziabad, India

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Abstract

Road safety is very important in our day to day life. Every year thousands of accidents happen during the driving of vehicles. For many accidents, reasons are not identified. There is need of device for recording vehicle evidences when the person is on the way and safe the people from malicious activities i.e. accidents, kidnapping etc. The system having acquisition system on the board is designed to monitor and record the vehicle speed, video recording, acceleration, steering input etc. This device is robust due to its design and work in different temperatures also. This device helps in investigations of road accidents, vehicle theft and kidnappings etc. Initially this system is fabricated in car.

Keywords

Raspberry Data acquisition system Arduino

References

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SMS Advisory System for Medical Assistance by using Neuro Fuzzy System

Publisher: IEEE

Ankit Verma ; Gaurav Agarwal ; Shashank Bhardwaj **All Authors**

Abstract: Cancer is a disease which causes increasing of human death rate in each year. Normally cancer can occur anywhere in human body. A major class of problems in medical scien... **View more**

Metadata

Abstract:
Cancer is a disease which causes increasing of human death rate in each year. Normally cancer can occur anywhere in human body. A major class of problems in medical sciences involves the diagnosis of disease based upon various tests performed upon patient. When several tests are involved the ultimate diagnosis may be difficult to obtain, even for medical expertise because of lot of different parameters obtained from the subject to be diagnosed. This has given rise, over the past few decades, to computerized diagnostic tools, intended to aid physicians in making sense out of the confusion of data. Clinical oncologists create diagnostic selections concerning cancer patient supported by past skilled experiences and information, intelligent techniques area unit probably the sole category of automatic technique powerful enough to emulate the expert's selection because of their stable behavior within the presence of noise in preciseness and uncertainty, the ANN and ANFIS techniques may doubtless get higher results than classical ways.

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 6 (2018) pp. 42-52

Genetic algorithms in computer aided design

ASHISH SHARMA

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KIET group of institutions, Ghaziabad
Uttar Pradesh, India.

Abstract

Design is a complex engineering activity, in which computers are more and more involved. The design task can often be seen as an optimization problem in which the parameters or the structure describing the best quality design are sought.

Genetic algorithms constitute a class of search algorithms especially suited to solving complex optimization problems. In addition to parameter optimization, genetic algorithms are also suggested for solving problems in creative design, such as combining components in a novel, creative way.

Genetic algorithms transpose the notions of evolution in Nature to computers and imitate natural evolution. Basically, they find solution(s) to a problem by maintaining a population of possible solutions according to the 'survival of the fittest' principle. We present here the main features of genetic algorithms and several ways in which they can solve difficult design problems. We briefly introduce the basic notions of genetic algorithms, namely, representation, genetic operators, fitness evaluation, and selection. We discuss several advanced genetic algorithms that have proved to be efficient in solving difficult design problems. We then give an overview of applications of genetic algorithms to different domains of engineering design.

Keywords: CAD; Genetic algorithms; Optimization; Geometric design; Conceptual design; Mechanism design

1. Introduction

Design is an engineering activity for creating new technical structures characterized by new parameters, aimed at satisfying predefined technical requirements. As does any process, it consists of several phases, which differ in details such as depth of the design, kind of input data, design strategy and procedures, and results: e.g. consider the differences between conceptual design and detail design. In spite of the great variety of design tasks, the design steps can often be interpreted as solving optimization problems. In this case a structure and/or a set of parameters is sought, which results in the best value of some attribute character-izing the quality of the design.

Classical (analytical or numerical) methods for calculat-ing the extrema of a function have been applied to engineering computations for a long time. While they perform well in many cases of everyday design practice they may fail in more complex design situations. In real design problems the number of design parameters can be very large, and their influence on the value to be optimized (the goal function) can be very complicated, having a strongly non-linear character. The goal function usually has many local extrema, whereas the designer is interested in the global extremum. Such problems cannot be handled by classical methods (e.g. gradient methods) at all, or they only compute local extrema. In these complex cases stochastic optimization techniques including evolutionary algorithms such as genetic algorithms may offer solutions to the problem; they may find a design near to the global optimum within reasonable time and computational costs.

Different variants of gradient methods start from a single point in the search space (a solution to the design problem), and search for a better solution in the direction of the gradient of the goal function (this method is also called hill climbing). If the new point has a better value of the goal function, it becomes the current point and the process is repeated. The method is efficient, because it requires just a few evaluations of potential solutions, which may be crucial in complex engineering problems. However, gradient methods have several difficulties. The basic problem is that gradient methods find only a local optimum, and no information is available on how good it is compared to the global one. Moreover, the local optimum found depends on the starting point; to improve results the computation is usually repeated for a number of starting points. The goal function must be smooth, and a procedure is needed to compute gradients (analytically, or at least numerically). In real design problems— with complicated or possibly discontinuous goal functions, and discrete variables— these conditions are in general not straightforward to fulfill.

Some of the disadvantages of the gradient method can be eliminated by the simulated annealing method, which is a stochastic search method. Here a new solution is obtained by perturbing the current solution. If the goal function of the new solution is better than that of the previous solution, then it is accepted. It is also possible, however, for the method to accept a solution, which produces a worse value of the goal function. The probability of accepting a worse solution is reflected in the temperature of the system. The temperature is gradually lowered as the search proceeds through an annealing process (e.g. following Boltzmann's law), thus allowing acceptance of worse solutions with greater probability at the beginning and with smaller probability later. From a practical point of view, the advantage of simulated annealing is that there is a good chance of finding the global optimum and that the solution does not depend on the starting point. It is clear, however, that simulated annealing requires higher computational effort than the gradient method.

Genetic algorithms strongly differ in conception from other

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 6 (2018) pp. 81-87

OPTIMIZATION OF INVENTORY BY SUPPLIER SELECTION USING TOPSIS METHOD IN PISTON AND RING INDUSTRY

Deepanshu Gupta[1], Anukriti[1], Vivek Pathak[2]

[1]*Department of Mechanical Engineering, KIET Group of Institutions, Ghaziabad, India*
[2]*Assistant Professor, Department of Mechanical Engineering, KIET Group of Institutions, Ghaziabad, India*

Abstract

As every industry needs to run parallel with the market demands to win most extraordinary advantages in which inventory management and demand forcasting of inventories accept an essential part. In view of which inventories and inventory optimization will be blended in like way and modified. For any industry to work profitably the trust between the supplier and buyer is a verifiable prerequisite. The idea of supply chains has as of late attracted significant consideration worldwide economy. This supply-side attention clarifies the accomplishment of the recently blasted economy in numerous regions under the immense worldwide opposition after the decay of old framework. This paper will at first discuss the basic definitions of supply chain management, inventory management and inventory optimization techniques. Inventory optimization should be planed to the point that the stream between them is continually smooth and versatile as demonstrated by the need of the client. After examination of the inventory network of the industry genuine attributes are picked. TOPSIS Method is actualized on the data achieved.TOPSIS procedure is utilized for determining the supplier's estimations. The positioning of the suppliers according to those attributes are derived with the objective that best inventory optimization is attained. The technique used has distinctive applications be it in day-to-day issues to complex present day issues. Thus, the aim of this paper is to decide the appropriate supplier giving the maximum consumer trustworthiness for the criteria recognized in the supply chain.

Keywords: Supply Chain Management, Inventory Management; Inventory Optimization; Multi-Criteria Decision Making; TOPSIS Method; Supplier Selection

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1. Introduction

In the ebb and flow circumstance supply chain management acknowledge an important centrality and calls for certified research thought, as associations are tried with finding ways to deal with meet routinely rising customer wants at a sensible cost. To do thusly, a manufacturer must request out which parts of their supply chain are not engaged, grasp which customer needs are not being met, develop change goals, and rapidly execute basic upgrades. Makers were the drivers of the store organize - managing the pace at which things were created and circled. Today, customers are settling on significant choices, and makers are scrambling to meet customer demands for decisions/styles/features, energetic demand fulfillment, and fast movement.

Inventory Management is a trying issue area in store network management. Associations require inventories in dispersion focuses with a particular true objective to fulfill client ask for, meanwhile these inventories have holding costs and this is set save that can be lost. In this way, the endeavor of stock organization is to find the measure of inventories that will fulfill the demand, keeping up a vital separation from over-burdens.

Lean Manufacturing framework has risen as a vital region of research in Indian setting. Diminishment in lead time enhances the efficiency. Here the variables influencing the lead time are distinguished. This examination has built up an endeavor to create basic model of factors, essential to execute by Interpretive Structural Modeling way to deal with decide the key elements which influence the lead time.

In the engaged business state of the 21st century, affiliations must answer quickly and unquestionably to client's solicitations. The choice of suppliers and their assessment are getting the chance to be extremely troublesome. Surveying suppliers and picking one of them are jumbled assignments in view of the way that diverse criteria or objectives must be considered in the essential initiative process. In this paper, we proposed a supplier assurance investigation considering Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method. TOPSIS framework is used for discovering the supplier's examinations.

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Analyzing problems and optimization of supply chain in different industries using SAW and TOPSIS methods

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Abstract

Due to high level competition in market, effective supply chain management has become a potentially important tool for gaining and effective competitive advantage and refining organizational performance, because the competition is not only amongst companies but also between supply chains. Supply chain plays a significant role in company's performance. Companies are challenged to explore ways to meet the customer demands and satisfaction at a manageable cost. To achieve this, business must find which parts of supply chain process are competitive and can be optimized with budget constraints meeting customer demands. In any unit it is mandatory to produce a high quality product with minimal budget successfully. Selection of a suitable supplier is equally important due to budget constraints. There are various methods for making the optimize result. In this research paper collecting the data from different industries and optimize the result by selecting TOPSIS and SAW methods for the solution of this problem. In this technique the decision is made by comparing each alternative with the ideal solution, hence delivering the best results.

Keywords: Supply chain, TOPSIS, SAW, Attributes/criteria.

1. Introduction

A supply chain is a unified network of all input data useful for production through the correct channel, it can be individuals, organizations, resources, activities and technologies related to the production and sale of a product or service. The supply chain starts with the delivery of the raw materials (raw materials) from the supplier to the producer and ends with the delivery of the finished product or service (product) to the final consumer / consumer. Supply chain coordination plays an important role in integrating the various actors in any supply chain, which leads to an increase in its efficiency. There are numerous mechanisms by which supply chain partners can coordinate with each other [1]. SCM controls every point of contact for a company's product or service, from initial creation to final sale. With so many places in the supply chain that can increase value by increasing efficiency or losing value by increasing costs, an adequate supply chain management system can increase revenues, reduce costs and affect a company's profits.

In a typical supply chain, the raw materials are purchased and the products are produced in one or more factories, sent to warehouses for intermediate storage and then sent to retailers or buyers. Therefore, in order to reduce costs and increase efficiency, effective levels of service, satisfaction and supply chain strategies must take into account the interaction at various levels in the supply chain.