November 2023

Vol No. 11

अनुसंधान

(KIET Research Magazine)

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Research and Development
KIET Group of Institution
Delhi-NCR, Ghaziabad, Uttar Pradesh, India-201206

KIET – A GLANCE

Overview

KIET Group of Institutions (KIET) was established in 1998 at Ghaziabad (Delhi-NCR) with an annual intake of 180 students. It is an AICTE-approved Institution affiliated to Dr. A.P.J Abdul Kalam Technical University (AKTU), Lucknow (formerly UPTU). KIET offers UG & PG courses in four disciplines i.e., Engineering, MBA, MCA & Pharmacy. With the glorious legacy of 25 years, the Institute now has 6800+ students and is empowered with 350+ highly qualified full-time faculty to nurture our students. Institute credentials and Centers of Excellence can be viewed @ our website www.kiet.edu.

The Institute has NAAC accreditation status with an 'A+' Grade and all its eligible programs are NBA accredited. The effort of the institute in imparting technical education has been recognized in terms of achieving 88th rank in the Pharmacy discipline, Rank Band (151-200) for Engineering and Innovation (51-100) Rank band in the National Institutional Ranking Framework (NIRF) - India Ranking 2023 released by Ministry of Education, GOI. The Institute has to its credit QS-I GAUGE 'Diamond' rating and Scientific and Industrial Research Organization (SIRO) recognition by the Department of Scientific and Industrial Research (DSIR) etc. The Institute also has a Technology Business Incubator (TBI) set up in association with NSTEDB, DST, Govt. of India to promote Innovation and Entrepreneurship in the Institute and the adjoining areas. Since its inception 125 incubate companies have established their venture in KIET-TBI. Presently 36 nos. incubate are operational.

With a rich alumni base of 19000+ students spread in all the nooks and corners of the world, the KIET Group of Institutions is moving efficiently towards its vision of shaping young minds with skill-oriented and value-based education as these alumni serve the dual purpose of mentoring the present students, as well as opening new doors for them.

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CONTENTS

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Message from the Face of Cover Page

Dear Readers,

It has been a great honor to be part of the monthly Research Magazine "Anusandhan" released by KIET. I want to express my sincere gratitude to the dedicated efforts of the students and teachers at KIET who consistently contribute to the release of this research-oriented magazine. After perusing the overview of the KIET website, I am delighted to discover that the fundamental focus of the KIET Institute lies in the development of a research environment. The quote, "A moment of difference makes a difference in your attitude" by Bruce Wilkinson resonates well with the mission and vision of the KIET Institute.

This emphasis on creating a transformative impact aligns with the institute's commitment to fostering a dynamic and innovative research atmosphere. The field of research demands persistence, with many researchers dedicating numerous sleepless nights to conducting experiments and documenting results. In the competitive realm of academia, the expectation is to initiate research early in one's career. The swift changes in society, technology, and culture have led to significant transformations in education. Evolving educational paradigms necessitate a reassessment of students' attitudes toward learning, influencing their learning abilities and willingness to engage.

In this context, there is a concerted effort to integrate research with study, aiming to analyze students' attitudes towards learning within the framework of subject knowledge and success orientation. As we stand on the precipice of a rapidly changing world due to climatic, environmental, and biological threats, the study of the physical sciences, particularly environmental chemistry and pharmaceutical chemistry, holds the promise of a better tomorrow.

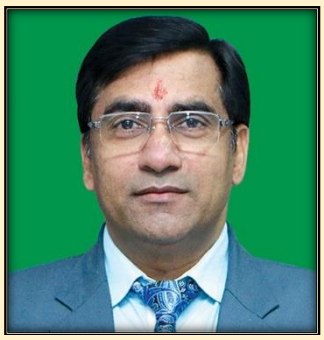
To preserve and protect our future tomorrow, it is necessary now to focus on our health and environment and the challenges it faces. Nowadays pharmaceutical and environmental chemistry become a booming field for researchers and students with galloping opportunities to consider and take up. It’s a field of study that will equip one to look for answers to all the questions about the environment as well as other areas like toxicology, biochemistry, and public health that hold phenomenal possibilities for research, development, and career success.

I extend my heartfelt congratulations to KIET Research Magazine for its outstanding efforts in promoting and presenting research within the academic community. There is always something new to discover and explore, and I eagerly anticipate witnessing more incredible research work and discoveries emerging from students in the years to come.

With the warmest congratulations and best wishes for your continued success.

Dr. Nimisha Jadon
Professor
Coordinator, School of Studies in Environmental Chemistry,
Jiwaji University, Gwalior (M.P.) India

Message from Chief Patron



Dear Esteemed Readers,

KIET Group of Institutions has always strived to be a beacon of knowledge, innovation, and progress in our ever-evolving world. Our commitment to excellence and dedication to fostering a culture of learning, discovery, and growth has remained unwavering. This magazine serves as a testament to our mission, and it is a privilege to share our stories, insights, and achievements with you.

In recent years, India has witnessed remarkable strides in various fields of research. Our nation's scientific and academic communities are working tirelessly to address some of the most pressing global challenges, from healthcare and environmental sustainability to cutting-edge technology and space exploration. These endeavors have not only propelled India onto the international research stage but also brought our scientists, scholars, and innovators well-deserved recognition.

The objective of this research magazine is to curate a collection of articles that encapsulate the diversity and dynamism of India's research landscape. Readers will have the opportunity to delve into the latest breakthroughs in fields such as artificial intelligence, renewable energy, biotechnology, space research, and many more. It is our commitment to bring you the most up-to-date, well-researched, and thought-provoking content that captures the spirit of innovation that defines research in India today.

In closing, I invite you to engage with us, to share your thoughts, feedback, and suggestions. This magazine is not just ours; it belongs to the community of knowledge seekers, innovators, and change-makers. I encourage you to share your thoughts and continue supporting the pursuit of knowledge and innovation. It is your enthusiasm and curiosity that propel our mission forward.

I also want to extend my heartfelt gratitude to all our contributors, editors, and the diligent team that works tirelessly behind the scenes to bring this magazine to life. Their dedication ensures that our message of progress and learning reaches you, our cherished readers.

Dr. Anil Ahlawat

Director In Charge

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Patron

Dear All,

It gives me great pleasure, in my capacity as Joint Director at the KIET Group of Institutions, to introduce this research magazine that focuses on the work that is being done at our institute and its future perspectives on knowledge and innovation. Our goal is to expand the horizons of both knowledge and innovation, and we have confidence that our researchers will unfold every stone and reach new heights.

By encouraging teamwork and open communication, we will be able to make progress in these areas. Our researchers will collaborate with industrial partners, government organizations, and other academic institutions to develop new technologies and solutions, share their findings, and disseminate their findings.

Our studies will ultimately result in scientific discoveries and technological advancements that are beneficial to society, and we intend to share these with anybody who could make use of them.

In closing, please accept my warmest regards for our researchers and partners. We are grateful for all the hard work and dedication you have shown in making our Institute a pioneer in research. Together, we can accomplish incredible things.

Dr. Manoj Goel

Joint Director KIET

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Editor-In-Chief

Dear Colleagues and Friends,

As Dean of Research and Development KIET, I am honoured to share the latest research and development activities with you. Our dedicated team of researchers, students, and faculties continue to progress significantly in various fields, from basic science to applied technology.

One of our major achievements this year has been the development of a new treatment for a rare genetic disorder. Our team discovered a novel therapeutic approach that has shown promising results in preclinical trials. We are now working to bring this treatment to the clinic and help patients suffering from this debilitating condition. It is a true example of how our research is not just limited to the lab but also can potentially make a real-world impact.

Another area where we have made significant progress is in the field of renewable energy. Our researchers have developed a new type of solar cell that has the potential to increase the efficiency and cost-effectiveness of solar energy significantly. This technology has already attracted the attention of several major companies, and we are currently transferring it to the industry for further development. It not only helps in protecting the environment but also in creating new job opportunities and economic growth. In addition to these specific achievements, KIET has progressed in several other areas. Our researchers have published numerous articles in top-tier journals, presented their work at international conferences, and received numerous grants and awards. It can showcase the quality of our research and our team's dedication and hard work. In addition to our ongoing research activities, we have also launched several new initiatives to support and promote research at our institute. We have also created a new seed funding program to support innovative and high-risk research projects that have the potential to make a significant impact. These initiatives help our researchers not just conduct research but also in developing their skills and knowledge.

I would also like to take this opportunity to express my gratitude to our researchers, scientists, engineers, and staff, who have worked tirelessly to make our institute a leader in research and development. Their dedication, passion, and hard work have been instrumental in our achievements, progress, and initiatives. I also want to thank our funding partners, collaborators, and supporters for their ongoing support and contribution.

Lastly, I would like to extend my best wishes and blessings to all of you, your families, and your friends. May the upcoming year be prosperous, happy, and in good health. With our collective efforts, we will be able to continue making a positive impact on the world through our research and development activities.

Dr. Vibhav Kumar Sachan

Dean (Research and Development)

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Foreword

Academic research and development related to the scientific investigation and experimentation undertaken by colleges, universities, and other higher education institutions aim to further enhance knowledge in a subject. Natural sciences, social sciences, and humanities are subjects in which academic academics can engage in research. Academic research and development aim to add to the corpus of knowledge and educate the next generation of scholars. Today, academic research collaboration may bring scholars from many institutions, fields, and nations to collaborate towards a single aim. Collaboration can take numerous forms, including co-authoring research articles, submitting joint funding applications, and conducting interdisciplinary research initiatives. Collaboration may give researchers access to new resources, such as specialized equipment or data sets, and the opportunity to share knowledge and get fresh views on a research subject. Collaboration also boosts the impact and exposure of research by enabling academics to reach new audiences and get acknowledgement for their work. In this sequence, research magazines play a significant role in academic research and development by providing a forum for scholars to disseminate their results to a larger audience. These periodicals focus on specialized disciplines of study, such as fundamental engineering, computer science, mathematics, and physics, and publish articles authored by subject matter experts. Technical journals may be an essential source of knowledge for researchers, presenting them with the most recent advancements and trends in their area. These publications can also act as a method for researchers to gain feedback from their peers. These periodicals are also excellent resources for students and scholars interested in recent advancements in their respective fields of study.

According to the above-mentioned factors, the publication "KIET Research Magazine" is being produced. It is envisaged that after reading this Magazine, a student or researcher will be aware of current research in his/her relevant subject and be able to identify a suitable partner if necessary. Most of the Magazine's material is drawn from KIET's research and development efforts.

The publication has endeavoured to provide as many study results as feasible while prioritizing reporting clarity. This publication is to report on KIET's research and endeavours, therefore increasing the global exposure of KIET's work. We are grateful to our colleagues for allowing us to present the mentioned research activity and their results in this publication. As appropriate, the names of each of these fellows are included in various sections of the Magazine.

We are deeply grateful to the Institute's Management, Director, Joint Director, Dean R&D, Heads, and all the associates for their support, blessings, and cooperation in publishing this multidisciplinary research magazine “अनुसंधान” .

Dr. Brijesh Singh

Editor

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Foreword

"Sharing knowledge is a charity of knowledge that constitutes the ways of a beautiful life" — Ehsan Sehgal

To enhance the beauty of the research domain, the KIET research magazine plays a vital role through the knowledge sharing of different domains, which may enhance the quality of research at inter and intra-departmental scales in the KIET Group of institutions. The awareness and acknowledgment of the outer niche may enhance the collaborative research among the various disciplines like environment, sustainability, energy, chemistry, modelling, mechanical, management, pharmacy, etc. This initiation is also likely to give positive outcomes in collaborative research publications, joint project submissions, joint work on patents, technical bulletins, etc. The holistic growth in the social, economic, and ecological pillars of society may be achieved through sharing of the scientific research and incorporation of the same through research institutes. It gives me great pleasure to introduce this supplement dedicated to research upgrowth. As filling such gaps may lead to a paradigm shift in research networking and upliftment in the research domain.

We heartily thank our management, the Director, the Joint Director, the Dean of R&D, and the entire KIET family for their unconditional guidance and support.

Dr. Minakshi Karwal
Associate Editor
KIET Group of Institutions
Delhi-NCR, Ghaziabad

"Research is something that everyone can do, and everyone ought to do. It is simply collecting information and thinking systematically about it" - Raewyn Connell

The KIET research magazine contributes significantly to inspiring young researchers to augment knowledge and innovation. The magazine also disseminates awareness about technical innovation in the field of science, technology, and management to faculty and students.

The highlights of the notable research activities conducted by our institute over the past month are included in this magazine issue. This would help the research activities to get a better reach and new dimensions in terms of collaborative publications, research articles, project proposal submissions, patent filing, etc.

To achieve the goal of the KIET Institute to observe the year 2023 as an innovation and start-up year, we are confident that KIET Research Magazine will continue to contribute significantly to the inner and outer specialization for greater scientific research and innovation.

We would like to extend our deepest gratitude to the Research and Development Team of the KIET Group of Institutions for their tireless work in ensuring the success of all research initiatives.

We are extremely grateful to the leadership of the KIET Group of Institutions, the Director, the Joint Director, the Dean of R&D, and the entire KIET family for their generous support and leadership over the years.

Dr. Himanshu Chaudhary
Associate Editor
KIET Group of Institutions
Delhi-NCR, Ghaziabad

Overview of the Research and Development

Rapid growth in scientific knowledge is an indication of the quest for discovery and has a substantial impact on economic and societal development. Science, technology, and innovation are often initiated in an Institution's research environment. Research and developmental activities create and disseminate new knowledge in different fields, promote innovation, and motivate better learning and teaching among faculty members and students at our Institute, as these are often incorporated into the courses. Research is the foundation of knowledge that brings new energy builds state-of-the-art facilities, promotes research publications, develops collaborations, and becomes part of an active community that shares common objectives. Moreover, there is good evidence that research supports and improves teaching and helps to build excellence in this dimension as well. Research can have salutary effects on faculty members, on the nature of their teaching, and the undergraduate and postgraduate students.

Evidence is accumulating that students do benefit in significant ways from having researchers as instructors if, the institution balances resources spent, and rewards assigned between research and teaching. This positive view, which has been consistently detected in recent studies, sees the benefits of 'research-led teaching.' In this approach, the experience of the researcher is integrated into teaching.

Vision

To achieve excellence in research and create an outstanding climate of support for researchers, broadly enabling research advances to meet National and International needs.

Mission

- To motivate faculty members to concentrate on research-related activities, in addition to teaching, to publish research articles in reputed journals.
- To pursue efforts to write books and monographs for publication by – International and National publishers of repute.
- To evince interest among the faculty members so that they take efforts to establish collaborative research projects with their counterparts in reputed National and International Universities.
- To encourage faculty members to submit proposals and secure funded research projects from various funding agencies in India and Abroad.
- To undertake consultancy projects sponsored by the Government as well as Private, Industrial, and other organizations.

Contact
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Department of Electronics & Communication Engineering
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e-mail: dean_rnd_office@kiet.edu, Contact No. +919718907912 (O)

Glimpses of Month

KIET Celebrates its Silver Jubilee with Hon'ble Chief Minister of Uttar Pradesh Shri Yogi Adityanath Ji:- On Wednesday, 1st November 2023, KIET Group of Institutions, Delhi-NCR Ghaziabad, organized a grand Silver Jubilee Celebration and Degree Distribution Ceremony on campus. The event was graced with the benign presence of Shri Yogi Adityanath Ji, Honourable Chief Minister of Uttar Pradesh, as the Esteemed Chief Guest. On this occasion, Shri VK Singh, State Minister, Central Government, Shri Narendra Kashyap, State Minister, Government of Uttar Pradesh, Shri Anil Aggarwal, MP Rajya Sabha, Ms. Sunita Dayal, Mayor Ghaziabad, Ms. Mamta Tyagi, Zila Panchayat Adhyaksh Ghaziabad, Shri Ajeeit Pal Tyagi, MLA Muradnagar, Prof Jai Prakash Pandey, Vice Chancellor, AKTU, Chairman KIET Shri Sarish Aggarwal, Vice Chairman Shri Atul Garg, Gen. Secretary Shri S P. Gupta, Treasurer Shri G.D. Jain, Director KIET Dr. (Col) A Garg, Joint Director Dr. Manoj Goel, other Governing Council Members of the Institute, faculty, staff members, young graduates, University Rank holders, Startup entrepreneurs, top alumni, and media representatives were also present.

Under the visionary leadership of the late Dr. Sanjay Sharma (Ex Dean (R&D) and HoD (ECE)), and in the presence of Honorable Director-in-charge Dr. Anil K Ahlawat, Honorable Joint Director Dr. Manoj Goel, Honorable Additional Director Dr. Shailesh Tiwari, Deans, Heads, faculty members, and students, the Electronics and Communication Engineering Department successfully launched the club named 'Robotics and Automation Club' on November 29, 2023.

The objective of the club is to create awareness among students for the development of humanoid robots and to meet the requirements of KIET campus as well as industries.

The faculty coordinator for the club is Dr. Shubham Shukla, the co-coordinator is Mr. Atul Kumar, and the student coordinators are Mr. Piyush Khanna and Mr. Harsh Chillar.

The Department of Computer Science and Information Technology (CSIT) is organizing a two-day hands-on workshop on the VEGA processor ecosystem from November 17-18, 2023, in association with the Ministry of Electronics and Information Technology (MEITY), IEEE India Council, and C-DAC.

VEGA Processors constitute a series of indigenous microprocessors developed by C-DAC under the Digital India RISC-V program. This pan-India workshop is being held simultaneously at multiple venues across the country. VEGA processors are part of the Make in India initiative, and their domain of applications is expanding over time. The Microprocessor Development Programme (MDP) is initiated and funded by the Ministry of Electronics and Information Technology (MeitY), Govt. of India, with the mission objective to design and develop indigenously a family of microprocessors and a complete ecosystem to enable fully indigenous product development that meets various requirements in the strategic, industrial, and commercial sectors.

This two-day workshop, featuring hands-on practice on various modules and sensors of the VEGA Ecosystem, will provide participants with an opportunity to convert their ideas into working projects that may address real-time problems existing in the real world. Mr. Rajeev Chandrasekar, Hon'ble Minister of State, MeitY & MSDE, Govt. of India, addressed the participants in online mode on India's roadmap to technological developments. There were various informative sessions by experts who are torchbearers in the RISC-V and VEGA Processors domain.

A team of two experts from CDAC Trivandrum has come to facilitate the hands-on session for the participants. There are 45 participants in the workshop, including 22 external participants.

On Thursday, November 9, 2023, KIET Group of Institutions, Delhi-NCR, hosted a pivotal National workshop titled "Implementation of National Education Policy (NEP) 2020: Challenges and Solutions." This event, organized in collaboration with the All India Council for Technical Education (AICTE) and Shiksha Sanskriti Utthan Nyas, New Delhi, brought together eminent academics, policymakers, and educators from various states, including Punjab, Haryana, Uttar Pradesh, and Delhi.

Hon'ble KIET management members, Shri Sarish Agarwal Ji, Chairman, Shri Sunil P. Gupta Ji, General Secretary, Shri G.D. Jain Ji, Treasurer, were present, along with key figures like Dr. Amik Garg, Director, Dr. Manoj Goel, Joint Director, Dr. Vibhav Kumar Sachan, Dean R&D, and Dr. Anil K Ahlawat, Dean Academics.

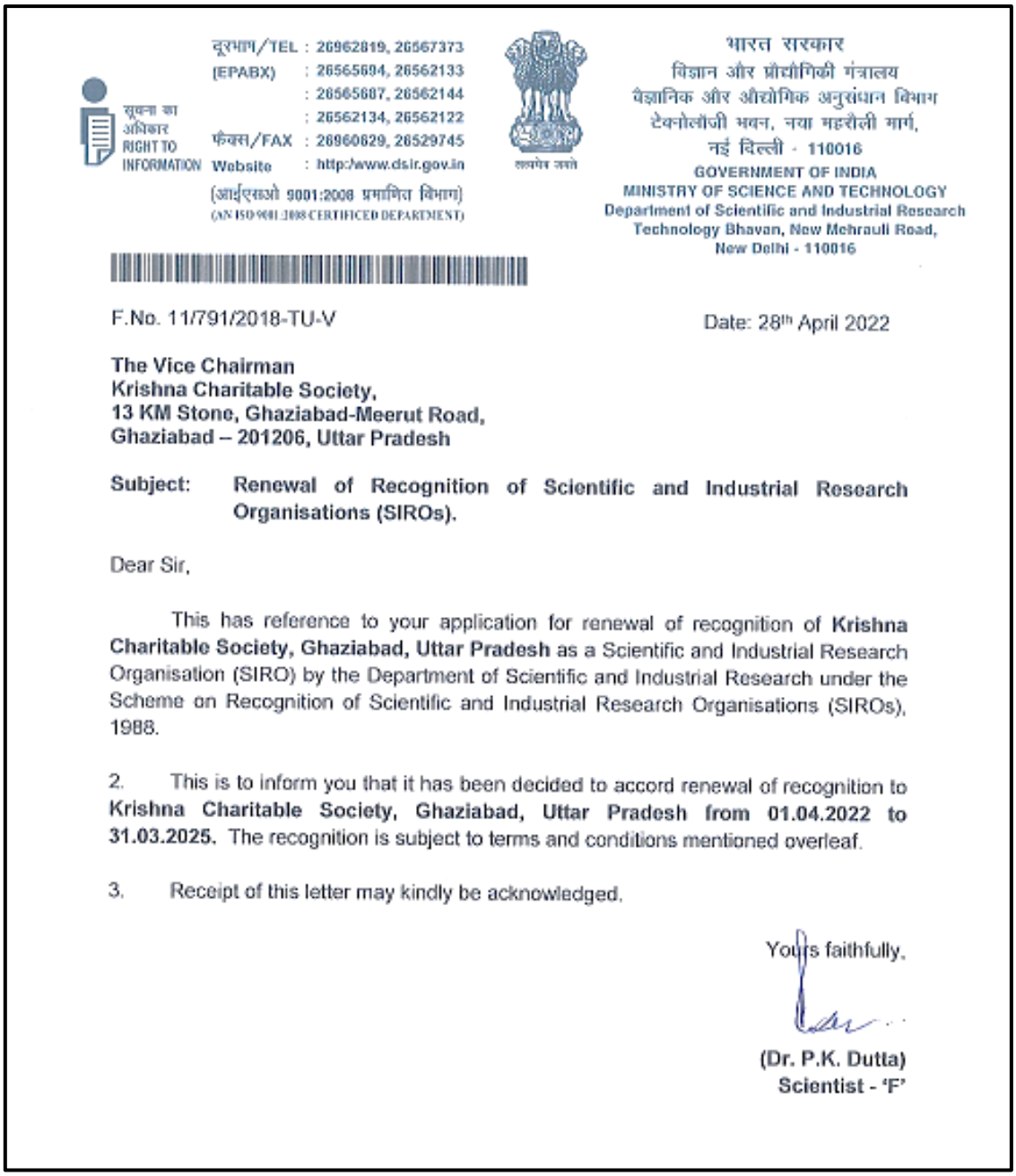
The workshop commenced with a welcome address by Dr. Amik Garg, delving into the significance of NEP 2020. The chief guest, Dr. Atul Kothari, National Secretary, Shiksha Sanskriti Utthan Nyas, New Delhi, provided insights into the policy's holistic approach to development. Notable speakers, including Prof. R.P. Tiwari, Prof. Madhusudan Singh, Prof. (Dr.) Navin Sheth, Dr. Parul Bhatnagar, Dr. Buddha Chandrasekhar, and Dr. Vivek Kumar, explored various facets of NEP 2020, emphasizing inclusivity, flexibility, and a shift toward skill-based curricula.

The workshop concluded with a valedictory session, where Shri Atul Kothari Ji reiterated the importance of proactive innovation and community involvement in education. He stressed the need for parent engagement and outreach to rural areas to ground NEP 2020 in the reality of the Indian populace. This workshop not only discussed educational policies but also ignited a collective commitment to adapt to the evolving educational landscape, ensuring NEP 2020 becomes a blueprint for action in the years to come.

Statistics of KIET Research and Development Activities

Rankings & Accreditations

- **NAAC - Grade 'A+' (Cycle 2 Assessment) - Accredited for 5 years till 03 Jan 2027.**
- **NIRF 2023 (Pharmacy – Rank 88 & Engineering - Rank Band (151-200).**
- **NIRF 2023 Innovation Rank Band (51-100).**
- **QS-IGAUGE - 'Diamond' College Rating (till Feb 2024) & 'Institution of Happiness' Award.**
- **Innovation Hub, AKTU – Hon'ble VC AKTU Appointed KIET as Nodal Regional Centre**
- **NBA Accreditation - All eligible programs are NBA accredited.**
- **KIET Group of Institutions, Delhi-NCR, Ghaziabad (UP) recognized by the Scientific and Industrial Research Organization (SIROs) under the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India. (Till 31 Mar 2025)**



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(AN ISO 9001:2008 CERTIFICED DEPARTMENT)

सत्यमेव जयते

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New Delhi - 110016

F.No. 11/791/2018-TU-V

Date: 28th April 2022

The Vice Chairman
Krishna Charitable Society,
13 KM Stone, Ghaziabad-Meerut Road,
Ghaziabad – 201206, Uttar Pradesh

Subject: **Renewal of Recognition of Scientific and Industrial Research Organisations (SIROs).**

Dear Sir,

This has reference to your application for renewal of recognition of **Krishna Charitable Society, Ghaziabad, Uttar Pradesh** as a Scientific and Industrial Research Organisation (SIRO) by the Department of Scientific and Industrial Research under the Scheme on Recognition of Scientific and Industrial Research Organisations (SIROs), 1988.

2. This is to inform you that it has been decided to accord renewal of recognition to **Krishna Charitable Society, Ghaziabad, Uttar Pradesh from 01.04.2022 to 31.03.2025.** The recognition is subject to terms and conditions mentioned overleaf.

3. Receipt of this letter may kindly be acknowledged.

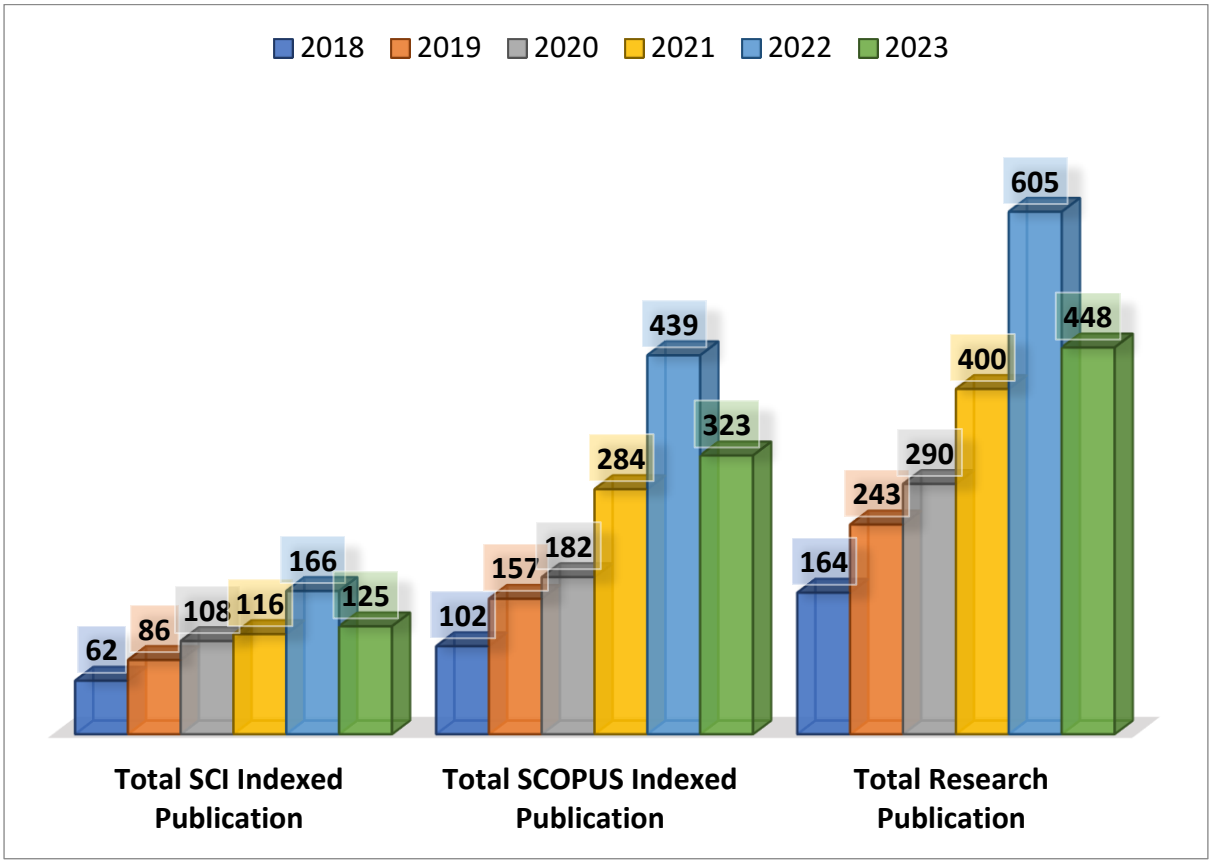
Yours faithfully,

(Dr. P.K. Dutta)
Scientist - 'F'

KIET Research Credentials

A total of 663 SCI Research Publications and 1487 Scopus Indexed Research Publications with an affiliation of KIET Group of Institutions, Delhi-NCR, Ghaziabad are listed in Web of Science and Scopus Database till November 2023.

Year	Total Number of SCI Indexed Publications	Total Number of SCOPUS Indexed Publications	Total Number of Research Publications
2018	62	102	164
2019	86	157	243
2020	108	182	290
2021	116	284	400
2022	166	439	605
2023	125	323	448
Total	663	1487	2150



Category	Number of Publication for October 2023	Number of Publication for November 2023
SCOPUS Publications	22	46
Web of Science Publication	12	13

Details of Patents Published/Granted

Title of the Invention: A Method and System for Manager Selection Using Network Centrality in Organizations

Application Number: 202311069284 A (Indian Patent Office)

Applicant(S): KIET Group of Institutions

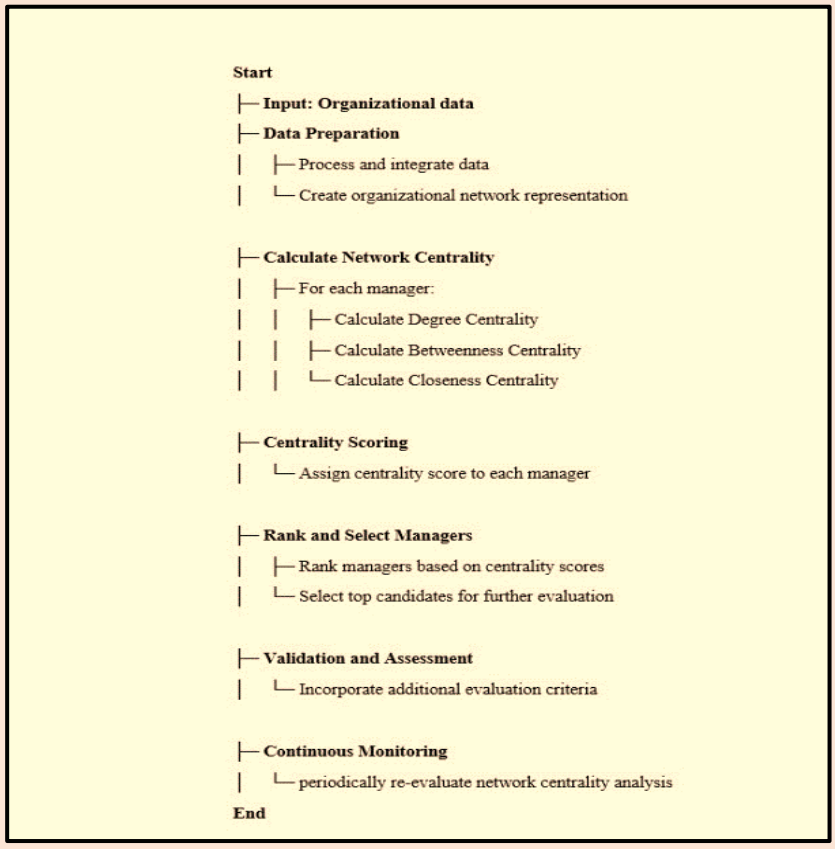
Date of Filing: 14-10-2023

Date of Publishing: 24-11-2023

Field of the Invention: The present invention relates to the application concept of Graph Theory (Network Centrality) in human resource management within organizations and, more specifically, to a method and system for using network centrality measures to identify suitable managers based on their influence and connectivity within the organizational network.

Objects of the Invention: The principal object of the present invention is to overcome the disadvantages of the prior art by providing a method and a system for utilizing a network centrality for selecting suitable managers in an organization. An object of the present invention is:

- To provide a method and a system for utilizing a network centrality for selecting suitable managers in an organization that is objective and data-driven, wherein the selection process is based on quantitative metrics derived from the organizational network data.
- To provide a method and a system for utilizing a network centrality for selecting suitable managers in an organization that provides enhanced collaboration, wherein by identifying managers with high network centrality, the system promotes collaboration and knowledge sharing.
- To provide a method and a system for utilizing a network centrality for selecting suitable managers in an organization that improves decision-making, wherein the managers with high network centrality are well-positioned to gather and disseminate critical information, leading to better decision-making processes.



Summary of the Invention: The present invention provides an approach to selecting suitable managers within an organization by utilizing network centrality measures.

By leveraging network analysis techniques, the system enables organizations to identify managers who can effectively foster collaboration, enhance information flow, and drive organizational productivity.

The disclosed method and system provide an objective and data-driven approach to selecting suitable managers based on their network centrality within the organization.

Network centrality metrics, such as degree centrality, betweenness centrality, and closeness centrality are calculated using available organizational data, including communication patterns, collaboration activities, and hierarchical relationships.

Fig. It shows a flow chart for a method for using network centrality measures to identify suitable managers based on their influence and connectivity within an organizational network, in accordance with an exemplary embodiment of the present invention.

Title of the Invention: Analysing and Forecasting Criminal Activity Using Artificial Intelligence and Deep Learning

Application Number: 202311069359 (Indian Patent Office)

Applicant(S): Mr. Amit Kumar Singh Sanger (CS)

Date of Filing: 14-10-2023

Date of Publishing: 24-11-2023

Field of The Invention: The present invention is based on the computer science, Law, Societal field where machine learning algorithms and criminal profiling laws are used to recommend and suggest suitable techniques for the forensic investigation.

The system has two major components; the physical equipment for sensing and takes input from the human; and second component is the processing unit i.e., Blockchain, Cloud, AI, ML based Criminal Digital Forensic Investigation Application.

Objectives: An object of the present disclosure is to suggest the appropriate and most suitable criminal profile to ease forensic criminal investigation.

An object of the present invention is to provide criminal database globe wide which can save time and resources.

An object of the present disclosure helps the investigators to maximize the utilization of the resources; and get the maximum outcome.

A Database system using Blockchain and Cloud and prediction by using ML-Based system as well as IOT equipment is suggested and discussed in the present invention.

The present system uses the machine learning algorithms to process the inputs by the investigators and give suggestions and instructions.

Summary: The present invention is a powerful method for the criminal investigation to suggest and predict criminal or un-authentic activities.

The inventors have shown the present invention which is the ML-Based system using the IOT supported Equipments. In an embodiment, the sensors and the processing device is

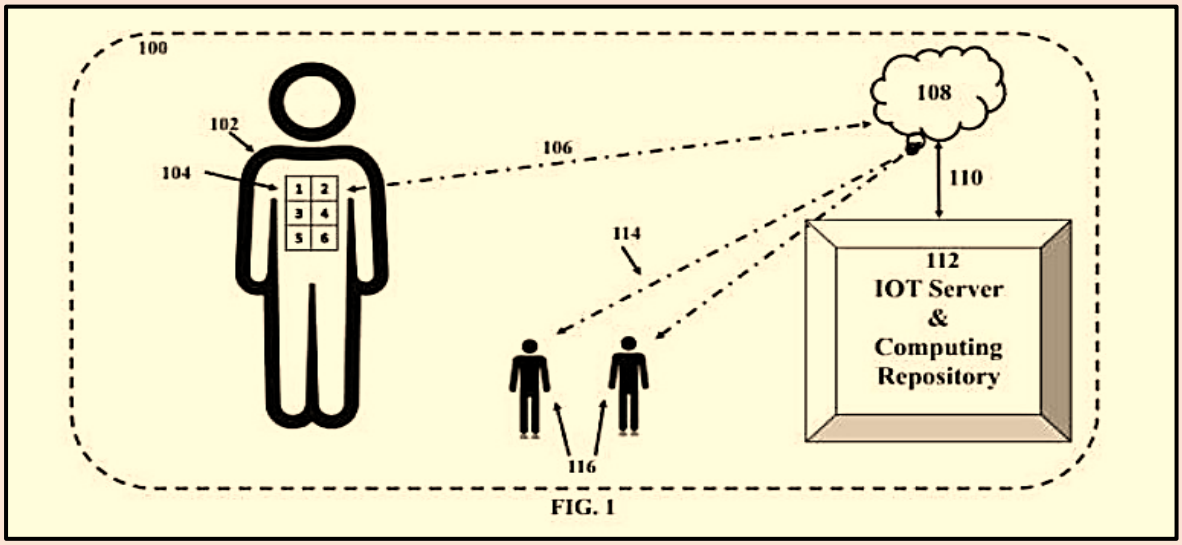


FIG. 1

used to check the human responses. The stored results go to the computing device to process using machine learning algorithms.

Based on the processed input values, the system will recommend the best suitable criminal profile to the investigator.

Fig. 1: Illustrates an exemplary architecture of the system in which human data is to be taken by sensors and then stored on IOT & Cloud repository, in accordance with an embodiment of the present disclosure.

Title of the Invention: **Mediwatch: A Machine Learning-Enabled Smart Patient Monitoring System with Web Application**

Application Number: 202311069401 A (Indian Patent Office)

Applicant(S): Praveen Kumar Gupta, Dr. Arun Kumar Tripathi, Anshika Varshney, Prerna Bhardwaj, Priyanka Pandey, Yadit Kumar, Dr. Deepti Seth, Harsh Vardhan

Date of Filing: 15-10-2023

Date of Publishing: 24-11-2023

Field of the Invention: The combination of cutting-edge machine learning algorithms and patient monitoring technologies in "MediWatch" revolutionizes healthcare. With the help of this ground-breaking innovation, healthcare providers may now access a sophisticated system that can automatically analyse a wide range of patient data. To proactively identify abnormalities, anticipate prospective health risks, and provide personalised therapies, MediWatch analyses vital signs, medical history, and lifestyle trends using machine learning. Because of the seamless incorporation of this technology into a web application, it is simple to access and monitor, enabling both patients and healthcare professionals to make educated choices and improve healthcare outcomes.

OBJECTS OF THE INVENTION: Automated Patient Monitoring: Create a system that continually and autonomously tracks different patient health metrics, obviating the need for human intervention and increasing the effectiveness of healthcare monitoring.

Integrate cutting-edge machine learning algorithms: to analyse various patient data sets, allowing the system to identify patterns, anomalies, and trends in real-time and giving healthcare professionals insightful data.

Real-time Anomaly Detection: Use algorithms to spot out-of-the ordinary behavior or changes in a patient's usual range of health data. Utilise machine learning models for predictive analysis: to identify prospective health issues based on past patient data.

This will help healthcare professionals create proactive treatment strategies and lower the likelihood of unfavorable outcomes.

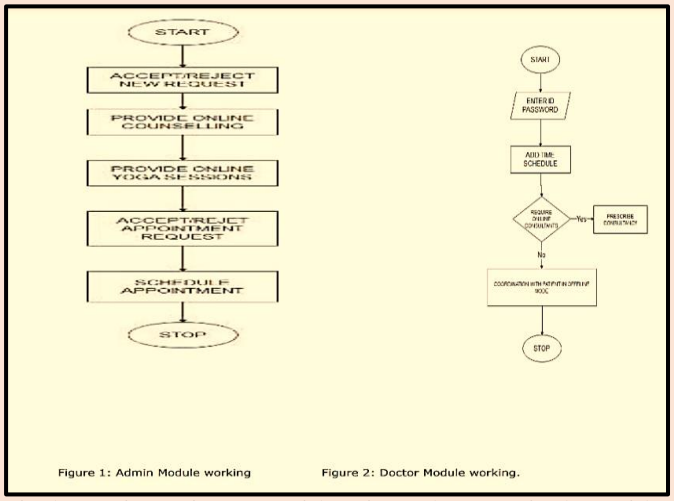


Figure 1: Admin Module working

Figure 2: Doctor Module working.

Provide personalised health recommendations: based on machine learning analysis, taking into consideration the features of each patient as well as their medical history, lifestyle, and health objectives to optimise their treatment plans.

Advantages of the Invention: The present invention has the following advantages:

- Real-time observation
- Finding an anomaly early
- Health Prediction Insights
- Optimised Resource Usage
- Engagement and empowerment of the patient
- Improvements in Decision-Making
- Health Management That Is Personalised
- Accessibility and convenience from a distance
- Better Patient Results
- Scalability and Adaptivity

Title of the Invention: **IoT-Based Smart Grid Management System Employing Machine Learning for Efficient Energy Distribution**
Application Number: 202311071715 A (Indian Patent Office)
Applicant(S): Gaurav Dubey (CS)
Date of Filing: 20-10-2023
Date of Publishing: 24-11-2023
Field of The Invention: The present invention is related to the Smart Grid in the computer science and machine learning field.
Objects of The Invention: Smart meters are IoT devices that can be installed at consumers' homes or businesses to measure and record electricity usage in real-time. They are a crucial part of a smart grid system. These meters communicate data, such as energy consumption patterns and usage fluctuations, back to the central grid management system. Machine learning algorithms can then analyze this data to gain insights into consumer behavior, optimize energy distribution, and implement demand response programs.
A predictive maintenance system is an integral part of the smart grid management system. It uses IoT sensors and machine learning algorithms to continuously monitor the condition of grid equipment, such as transformers, switches, and substations. By collecting data on temperature, vibration, and other performance metrics, machine learning models can predict when equipment is likely to fail or require maintenance. This proactive approach helps prevent unexpected outages and optimizes maintenance schedules, resulting in a more reliable grid.
Abstract: The IoT-Based Smart Grid Management System Employing Machine Learning for Efficient Energy Distribution is a pioneering technological solution that addresses the challenges of modernizing and optimizing energy distribution within smart grids.
This innovative system integrates the Internet of Things (IoT) and machine learning to create a dynamic, self-adapting grid infrastructure capable of enhancing energy efficiency, reliability, and sustainability.
The system is founded on a multi-faceted approach, encompassing the deployment of IoT sensors and devices across the grid to capture real-time data on energy consumption, equipment performance, and grid conditions.
This data is then harmoniously integrated and stored within a centralized repository. Machine learning models, meticulously trained on historical data, are employed to conduct real-time analysis, detect anomalies, forecast energy demand, and predict equipment failures. Subsequently, automated decisions and recommendations are made, equipping grid operators and maintenance teams with invaluable insights for prompt, proactive action.
The benefits of this invention are manifold. It enables predictive maintenance, reducing costly downtime and enhancing grid reliability. Furthermore, real-time anomaly detection and response mechanisms ensure grid stability and minimize energy wastage.

Fig. It represents the working model in the present invention with its Prototype

PATENTS Published - November 2023

S. No.	Title Of Patent	Dept.	Name Of Applicant	Date Of Publication	Status
1.	Thermal Spray Gun for nanoparticle coating	ME	Dr. Pratibha Kumari	17.11.2023	Granted
2.	Analysing and Forecasting Criminal Activity Using Artificial Intelligence and Deep Learning	CS	Mr. Amit Kumar Singh Sanger	24.11.2023	Published
3.	A Method and System for Manager Selection Using Network Centrality in Organizations	CS	KIET Group of Institutions, Ms Anshula Gupta, Ms Shivani	24.11.2023	Published
4.	Mediwatch: A Machine Learning-Enabled Smart Patient Monitoring System with a Web Application	CS, AS	Praveen Kumar Gupta, Arun Kumar Tripathi, Anshika Varshney, Prerna Bhardwaj, Priyanka Pandey, Yadit Kumar, Deepti Seth, Harsh vardhan	24.11.2023	Published
5.	IoT-Based Smart Grid Management System Employing Machine Learning For Efficient Energy Distribution	CS	Gaurav Dubey	24.11.2023	Published
6.	Dynamic Autonomous Learning System (Dals): A Novel Approach in Machine Learning	CS	Anurag Mishra	24.11.2023	Published
7.	IoT Based Cleft Lip and Palate Surgical Equipment	KIET	Dr Amik Garg	24.11.2023	Published

Details of Research Incentives for Journals

S. No.	Name of Faculty	Designation	Dept.	Title of Paper and Name of Journal	Impact Factor/Cite Score	Benefits/ Incentives	Index in Journal
1.	Ajay Kumar	Assistant Professor	IT	"Recommendation of Regression Models for Real Estate Prediction using Multi-Criteria Decision Making." International Journal of" Communication Software and Systems	1.8	3000	Scopus

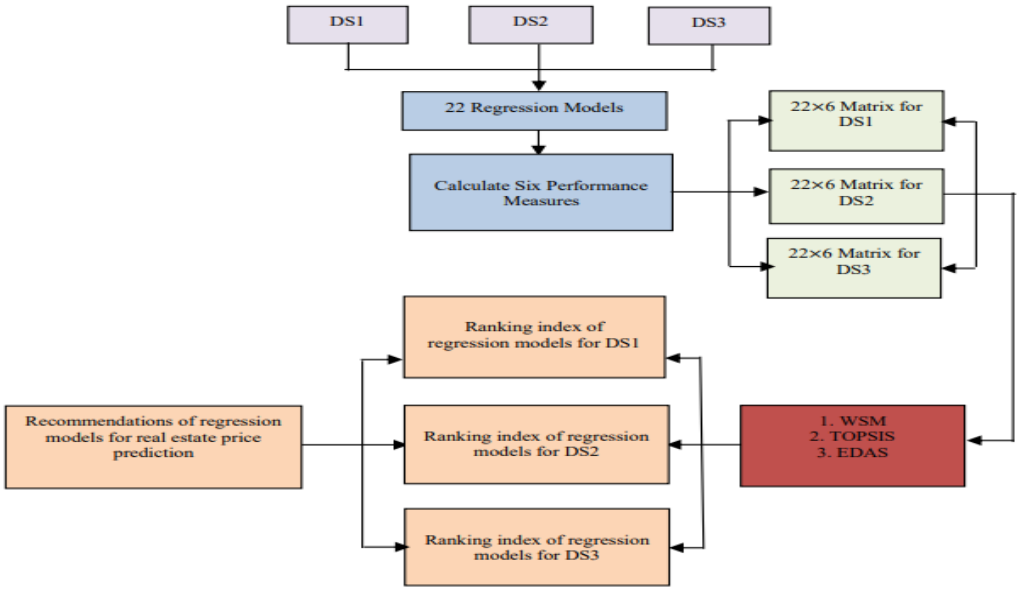
2.	Sushil Kumar	Associate Professor	CSE	" A Comprehensive Review on Segmentation Techiniques for Satellite Images". International Journal on Archives of Computational Methods In Engineering	9.7	21,000	SCIE
3.	Mohd. Shariz Ansari	Associate Professor	EN	" A Review of Optimization Techniques for Hybrid Renewable Energy Systems." International Journal on Modelling and Simulation	5.4	5000	Scopus
4.	Shikha Kaushik	Assistant Professor	KSOP	" Preclinical to Clinical Profile of Curcuma Longa as Antidiabetic Therapeutics." International Journal on Current Topics in Medicinal Chemistry	3.4	11000	SCIE
5.	Vivek Kumar Pathak	Assistant Professor	ME	" Analysis of Last Mile Delivery Performance Barriers by the DEMATEL Approach." International Journal of" " Evergreen: Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy	3.8	5000	Scopus

Highlights of the Published Journal Articles

1. Ajay Kumar, "Recommendation of Regression Models for Real Estate Price Prediction using Multi-Criteria Decision Making", Journal of Communications Software and Systems, Vol. 19, No. 3, September 2023.

Accurate prediction of real estate prices is an essential task for establishing real estate policies. Even though various regression models for real estate price prediction have been developed so far, selecting the most suitable regression model is a challenging task since the performance of different regression models varies for different accuracy measures. This paper aims to recommend the most suitable regression model for real estate price prediction, considering various performance measures altogether using multi-criteria decision-making (MCDM). The evaluation of regression models involves several competing accuracy measures; hence, choosing the best regression model for predicting real estate price is modelled as the MCDM problem in the proposed approach. An experimental study is designed using 22 regression models, three MCDM methods, six performance measures, and three real estate price datasets to validate the proposed approach. Experimental outcomes show that Gradient Boosting, Random Forest, and Ridge Regression are recommended as the best regression models based on MCDM ranking. The results of the experimental study show that the

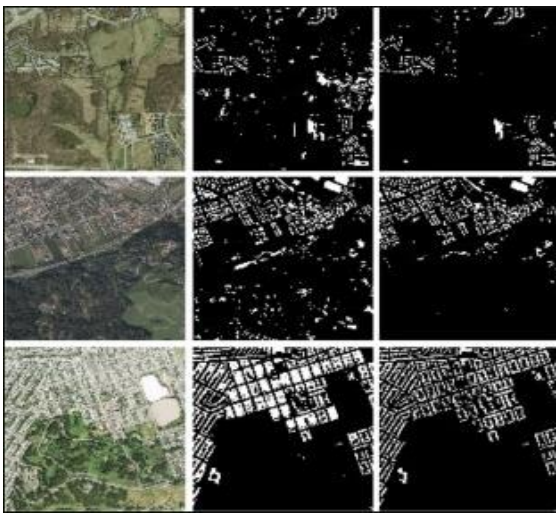
proposed MCDM-based strategy can be utilized effectively in real estate industries to choose the best regression model for predicting real estate prices by optimizing several competing accuracy measures.



Graphical representation of the experimental study

2. Bagwari, N., Kumar, S. & Verma, V.S. A Comprehensive Review on Segmentation Techniques for Satellite Images. *Arch Computat Methods Eng* 30, 4325–4358 (2023). https://doi.org/10.1007/s11831-023-09939-4

Segmentation of satellite images is a noteworthy and essential step for better understanding and analysis in various applications such as disaster and crisis management support, agriculture land detection, water body detection, identification of roads, and buildings, transformation analysis of forested ecosystems, and translating satellite imagery to maps, where the satellite image can be utilized for remotely monitoring any specified region. This manuscript contemplates the comprehensive and comparative analysis of existing satellite



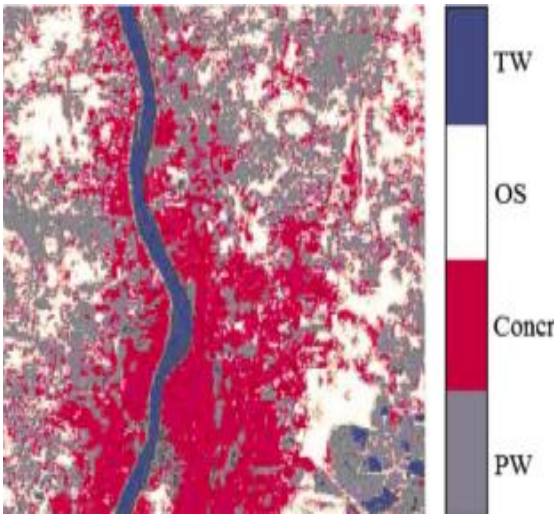


image segmentation techniques with their advantages, disadvantages, experimental results, and futuristic discussion. The comprehensive and comparative analysis provides the basic platform and a new direction of research to perspective readers working in this area. In this review, existing segmentation techniques are extensively analyzed and categorized based on their methodology similarities. In the reviewing process of state-of-the-art satellite image segmentation techniques, it has been noticed that the problems of semantic and instance segmentation are solved effectively using deep learning approaches. The entire review process exhibits the problem of the limited dataset, limited time to train a network, objects appearing differently from different imaging sensors, and class imbalance in semantic and instance

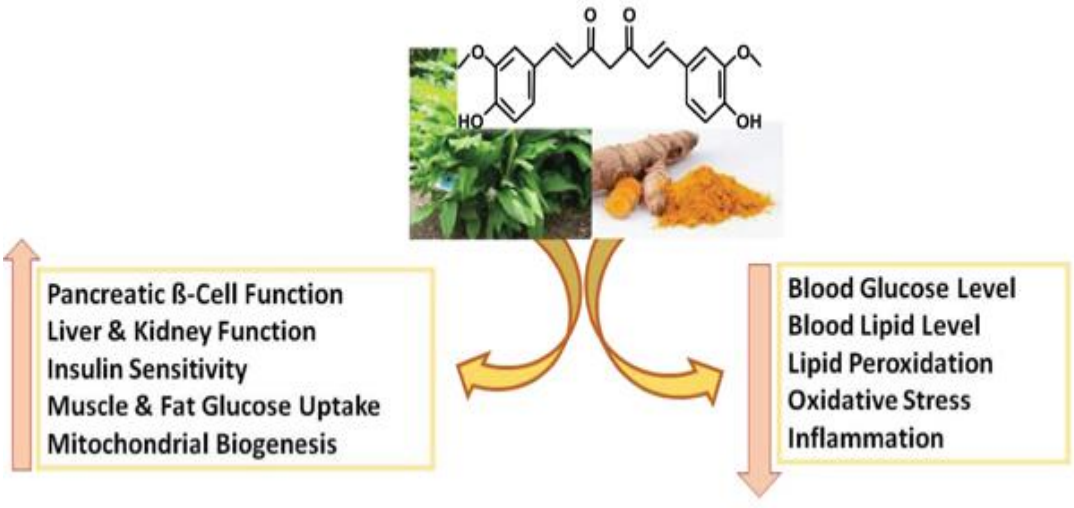
segmentation. A fully convolutional network, U-Net, and its variants are utilized to solve these problems by applying transfer learning, synthetic data generation, artificially generated noisy data, and residual networks. This manuscript focuses on the existing work and helps to provide comparative results, challenges, and further improvement areas.

3. Mohammad Shariz Ansari, Mohd. Faisal Jalil & R.C. Bansal (2023) A review of optimization techniques for hybrid renewable energy systems, International Journal of Modelling and Simulation, 43:5, 722-735, DOI: 10.1080/02286203.2022.2119524

Solar photovoltaic and wind power systems are very much dependent on climate variations. Wind and solar photovoltaic systems are unreliable without storage units like batteries and diesel generators as backups. The addition of storage devices increases the reliability of the hybrid system consisting of solar photovoltaic and wind turbines. During cloudy and slow windy days, sufficient battery bank capacity is required to meet the load demand. This review paper gives new ways of hybrid energy generation. It discusses several optimization approaches and ideas for hybrid networks. Hybrid systems are gaining more popularity and fame in the current energy crisis scenario and environmental pollution. This research has provided a comprehensive assessment of existing optimization strategies, particularly those associated with the isolated microgrid in the literature. Artificial intelligence offers noteworthy optimization for microgrid operation without long-term weather data, as evidenced by the current optimization pattern for hybrid renewable sources.

4. Kaushik S, Masand N, Iyer MR, Patil VM. Preclinical to Clinical Profile of Curcuma longa as Antidiabetic Therapeutics. Curr Top Med Chem. 2023;23(24):2267-2276. DOI: 10.2174/1568026623666230428101440 PMID: 37132313.

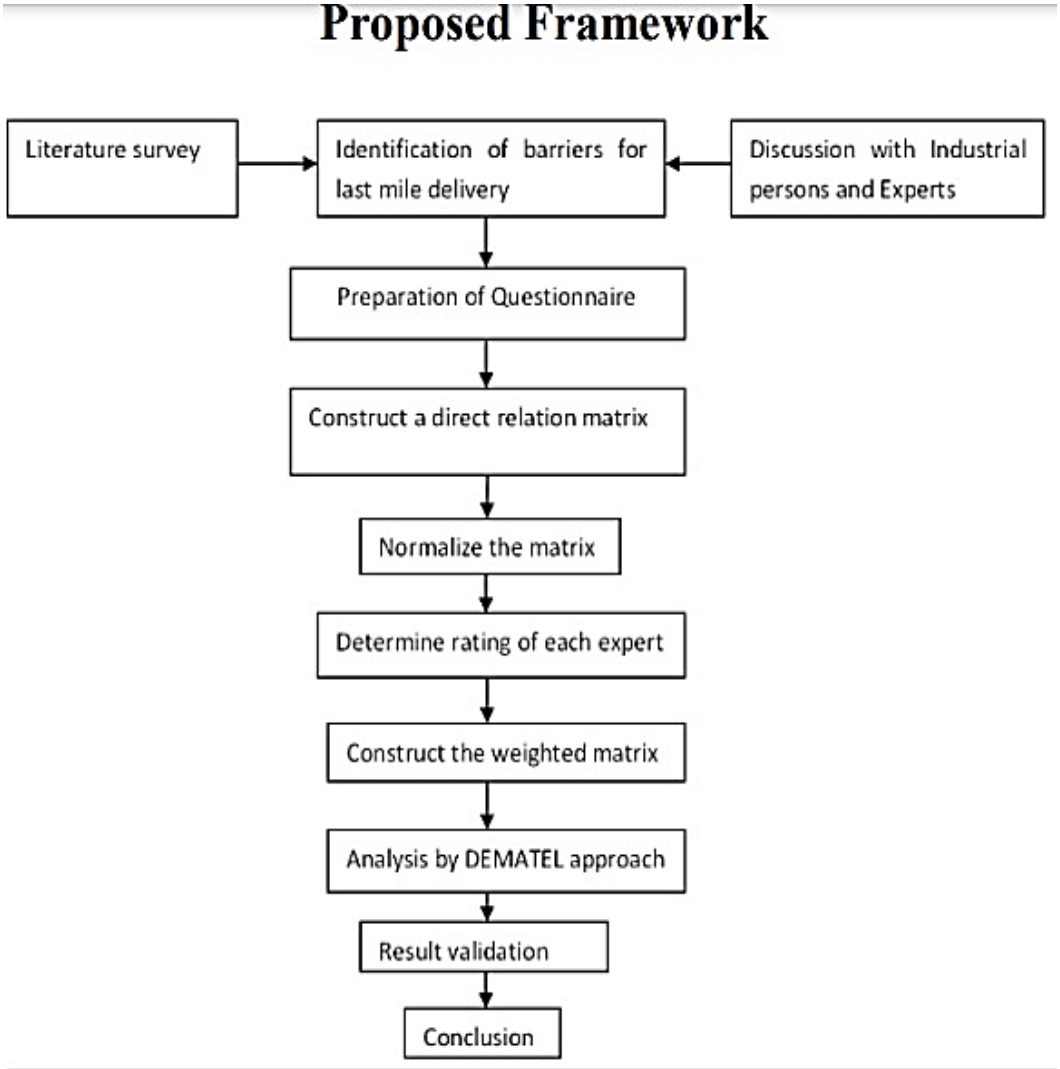
Natural product substances have historically served as the most significant source of new leads for pharmaceutical development. Presently, drug discovery and development have adopted rational approaches to explore herbal resources for treating lifestyle-related diseases such as diabetes. For the treatment of diabetes, Curcumin longa has been extensively studied for evaluation of its antidiabetic potential using various in vivo and in vitro models. Literature resources such as PubMed and Google Scholar have been extensively searched to collect documented studies. Various parts of the plant and extracts have proven antidiabetic effects, namely, anti-hyperglycemic, antioxidant, and anti-inflammatory action, through different mechanisms. It is reported that the plant extract or its phytoconstituents regulate glucose and lipid metabolism. The reported study concluded the diversified antidiabetic role of C. longa and its phytoconstituents and, thus, its potential use as an antidiabetic agent.



The diversified antidiabetic role of *C. longa* and its phytoconstituents.

5. **Vivek Kumar Pathak , Dixit Garg, Ashish Agarwal, "Analysis of Last Mile Delivery Performance Barriers by the DEMATEL Approach", EVERGREEN Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy, Vol. 10, Issue 03, pp1495-1507, September 2023.**
   Link - https://catalog.lib.kyushu-u.ac.jp/opac_download_md/7151698/p1495-1507.pdf

The E-commerce industry depends upon last-mile delivery performance. Some variables act as enablers which help to improve the last mile delivery performance whereas variables acting as barriers restrict the growth in last mile delivery performance. After a literature review of the supply chain, some variables are identified on which last-mile delivery performance depends. Among these variables, barriers have been identified. This paper analyses the impact of barriers on last-mile delivery performance. Based on literature review, expert talk, and brainstorming, twenty variables as barriers to last-mile delivery are identified. An integrated decision-making trial and evaluation laboratory (DEMATEL) approach is used to inter-relate barriers and cause/effect relationships among the barriers. Eleven barriers are selected to be considered in the cause group and further are in the effect group. Routing simulation, alternative vehicles, and unawareness about upgraded technology are the most important barriers according to the study. A framework for barriers to last-mile delivery is proposed which provides valuable insights to managers for better last-mile delivery performance and improves customer satisfaction.



Reimbursement of Conference Registration Fee

S. No	Name of Faculty	Designation	Dept.	Name of Conference	Title of Paper	Benefits/ Incentives	Published By
1.	Ajay Kumar	Assistant Professor	IT	International conference by Galgotias University Greater Noida. UP	"Application of MCDM Methods in cloud computing: A literature Review.	7000	IEEE
2.	Ruchin Gupta	Assistant Professor	IT	International conference by Nitte Meenakshi Inst. of Tech. Bengaluru 1-2 Sep. 2023	" An Efficient Prediction of Cardiovascular Diseases Using Machine Learning Models"	7500	IEEE
3.	Akash Goel	Assistant Professor	IT	International conference on Communication and Electronics Systems (ICCES -2023) By PPG Inst. 1-3 June 23 at Coimbatore	"Artificial Intelligance Based Healthcare Chat Bot System.	8000	IEEE
4.	Madhu Gautam	Assistant Professor	CSE	International conference by " Buddha Institute of Technology, Gorakhpur & REC, Sonbhadra, UP During 23-24 June 2023. On IoT Communication and Automation Technology.	" Automated Covid - 19 Detection Using MI & IoT	6900	IEEE

Highlights of the Published Conference Articles

1. A. Kumar, A.K. Singh, A. Garg, Application of MCDM methods in cloud computing: A literature review, Artificial Intelligence, Blockchain, Computing and Security Volume 1, 1st Edition of taylor francis sponsored book on Artificial Intelligence, Blockchain, Computing and Security Volume 1, CRC Press, ISBN: 9781003393580

Cloud computing has become one of the most prominent technologies due to recent developments in information technology. Because there are so many cloud service providers (CSPs), it might be difficult for users to choose a CSP that suits all of their needs. This study aims to review the application of multi-criteria decision-making

(MCDM) for selecting the best CSP. The contribution of this study is many-fold. First, this study reviewed various conferences and journal papers related to the application of MCDM in the area of cloud computing between 2012–2023. Second, a brief description of MCDM methods used in cloud computing is provided, along with a description of other popular MCDM methods that can also be used for CSP selection. Third, this study also highlights future research guidelines for researchers who want to research to address the problem of choosing the best service provider in cloud computing. The review done in this study will aid the users in choosing cloud service providers. Moreover, this review will help research scholars who want to work to address decision-making problems in cloud computing.

2. R. Gupta, H. Bansal, A. K. Singh, N. Bansal and A. Saini, "An Efficient Prediction of Cardiovascular Diseases using Machine Learning Models," 2023 International Conference on Network, Multimedia and Information Technology (NMITCON), Bengaluru, India, 2023, pp. 1-6. DOI: 10.1109/NMITCON58196.2023.10276141.

Cardiovascular diseases, including Heart Failure, ST-Elevation Myocardial Infarction (STEMI), and Pulmonary Embolism, are leading causes of morbidity and mortality worldwide. Early diagnosis and accurate prediction of mortality in these conditions are crucial for improved patient outcomes. The study used a machine learning approach using Gradient Boosting and XGBoost classifiers for efficient prediction of cardiovascular diseases (Heart Failure, STEMI, and Pulmonary Embolism) and in-hospital mortality on a comprehensive dataset. The study achieved high accuracy (mean accuracy: in-hospital mortality – 0.968, Heart Failure – 0.816, STEMI – 0.868, Pulmonary Embolism – 0.985) and discrimination ability (mean AUC: in-hospital mortality – 0.987, Heart Failure – 0.884, STEMI – 0.833, Pulmonary Embolism – 0.807) over existing studies. Additionally, feature importance analysis identified key factors contributing to these diseases. These findings provide a reliable tool for risk assessment and early intervention in patients with cardiovascular diseases, with significant implications for clinical practice and improved patient outcomes.

3. A. Goel, Satyam and S. Sharma, "Artificial Intelligence based Healthcare Chat Bot System," 2023 8th International Conference on Communication and Electronics Systems (ICCES), Coimbatore, India, 2023, pp. 1362-1366, DOI: 10.1109/ICCES57224.2023.10192727.

Machines are becoming capable of performing tasks like humans in this age of Artificial Intelligence. The most vital aspect of living a healthy life is health care, and the most difficult aspect is finding a doctor's consultant. Everyone cannot afford to visit a doctor for every health issue. The objective of the proposed research work is to design or build a Healthcare chatBot in AI to assist in determining the patient's health and providing basic information before contacting a doctor, but only for minor issues. Using a medical chatBot will save healthcare costs while also increasing medical knowledge. ChatBots are computer programs that employ AI and ML to connect with people. The chatBot system retrieves the query from the database that the user has requested and makes a judgement based on it before presenting the responses.

4. M. Gautam, H. Chaudhary, A. Verma, and R. Garg, "Automated COVID-19 Detection Using ML & IOT," 2023 International Conference on IoT, Communication and Automation Technology (ICICAT), Gorakhpur, India, 2023, pp. 1-5, DOI: 10.1109/ICICAT57735.2023.10263743.

COVID-19 has emerged as the biggest fear of all time. The timely and accurate detection of COVID-19 infection is very crucial for preventing the spread of infection. The behavior and symptoms of the infection are changing gradually and thus the existing statistical model fails to capture the dynamic behavior of the Coronavirus and its associated infected patient symptoms. Therefore, the objective of this study is to propose a novel framework that collects the data dynamically with IoT sensors and then utilizes that data to develop an automated statistical model for the detection of corona infection. COVID-19-associated data is captured dynamically through IoT sensors. The dynamic data is further utilized to develop the machine learning model for the detection of infection. The amalgamation of IoT and Machine Learning can help in developing an automated machine-learning model that can handle the dynamic behavior and changing symptoms of coronavirus and assist the medical expert in making timely and effective decisions.

Research Incentive for Book Chapters

S. No	Name of Faculty	Designation	Dept.	Category	Title of Book Chapter	Benefits/ Incentives	Published By
1.	Deepti Katiyar	Associate Professor	KSOP	Book Chapter	" Recent Advances in Pharmaceutical Innovations and Research"	2000	International Publisher Springer
2.	K. Nagarajan	Professor	KSOP	Book Chapter	" Recent Advances in Pharmaceutical Innovations and Research"	2000	International Publisher Springer
3.	K. Nagarajan	Professor	KSOP	Book Chapter	" Recent Advances in Pharmaceutical Innovations and Research"	2000	International Publisher Springer

CRDC Presentation Series

Activity Report November 2023

Collaborative Research and Development (CRD) Presentations 2022-23 (Odd)

Title: Performance Analysis of ANN Algorithms- Dr. Ankit Verma Assistant Professor (MCA)

The performance of an algorithm is a process of making evaluative judgments about algorithms. Performance of an algorithm means predicting the resources that are required for an algorithm to perform its task.

Summary

The time of operation is compared with the conventional method, Flower Pollination Algorithm, JAYA, and PSO. The minimum time of operation is achieved using the Ant Lion optimizer.

ALO proves its effectiveness in terms of maximum efficiency extraction from unknown search space and computational time.

Identified Thrust Area of Research

Artificial Intelligence and Machine Learning

- Analysing the performance of Artificial Neural Network (ANN) algorithms involves several key aspects:

1. Accuracy Metrics:

- Accuracy: Overall correctness of the model predictions.
- Precision: Proportion of true positive predictions among all positive predictions.
- Recall: Proportion of true positive predictions among all actual positives.
- F1-score: Harmonic mean of precision and recall.

2. Loss Functions:

- Cross-Entropy Loss: Measures the difference between predicted and actual values, commonly used in classification problems.
- Mean Squared Error (MSE): Often used in regression problems.

3. Training Metrics:

- Learning Rate: Determines the step size during optimization.
- Convergence Rate: Time or epochs required for the model to converge.
- Overfitting/Underfitting: Check for signs of overfitting (model learns training data too well) or underfitting (model performs poorly on both training and test data).

4. Validation and Testing:

- Validation Set: Separate dataset used to tune hyperparameters and prevent overfitting.
- Testing Set: Final evaluation of the model's generalization on unseen data.

5. Model Architecture:

- Number of Layers: Depth and complexity of the neural network.
- Number of Neurons per Layer: Determines the model's capacity to learn.
- Activation Functions: Impact on the model's nonlinear learning ability (ReLU, Sigmoid, Tanh, etc.).

6. Regularization Techniques:

- Dropout: Randomly deactivating neurons during training to prevent overfitting.
- L1/L2 Regularization: Adding penalty terms to the loss function to reduce overfitting.

7. Optimization Algorithms:

- Gradient Descent Variants: Adam, RMSprop, SGD, etc. affect convergence and speed of learning.

8. Hyperparameter Tuning:

- Grid Search or Random Search: Finding the best combination of hyperparameters for optimal performance.

9. Model Interpretability:

- Analyzing feature importance or activations to understand which inputs contribute more to the model's decisions.

10. Resource Utilization:

- Computational Cost: Training and inference time, memory usage.
- Scalability: Ability to handle larger datasets or parallel computing.

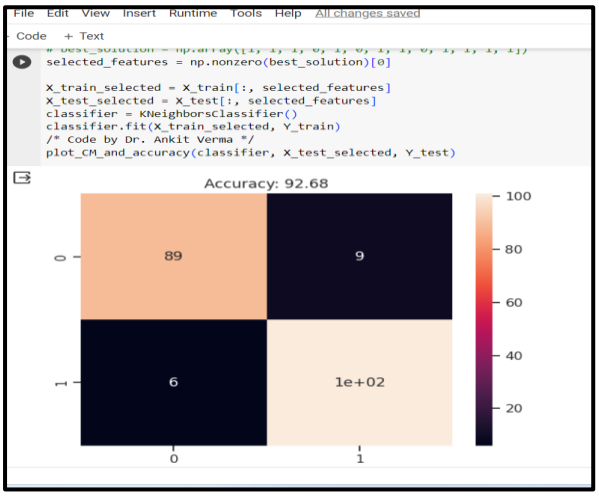
Techniques for Performance Improvement:

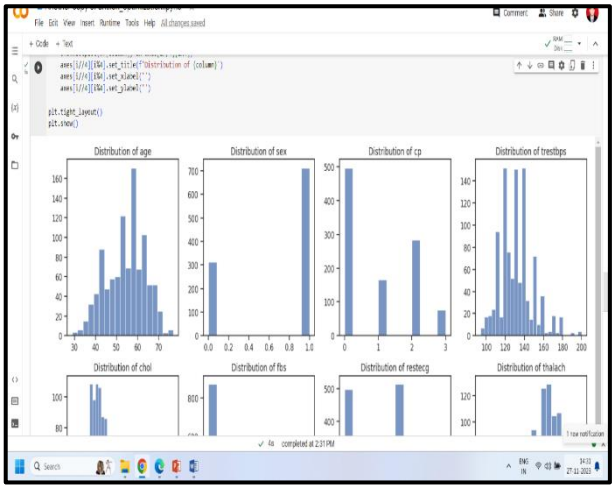
- Transfer Learning: Using pre-trained models and fine-tuning them for specific tasks.
- Ensemble Methods: Combining multiple models for better accuracy and robustness.
- Data Augmentation: Increasing the diversity of training data to enhance model generalization.
- Visualization Tools.
- Learning Curves: Visualize training and validation performance over epochs.

- Confusion Matrix: Understanding the model's performance in a classification problem.
- ROC Curve and Precision-Recall Curve: Assessing model performance across different thresholds.

Analyzing the performance of ANN algorithms involves a holistic view, considering metrics, architecture, hyperparameters, and interpretation to ensure optimal performance and generalization on unseen data.

Confusion Matrix:



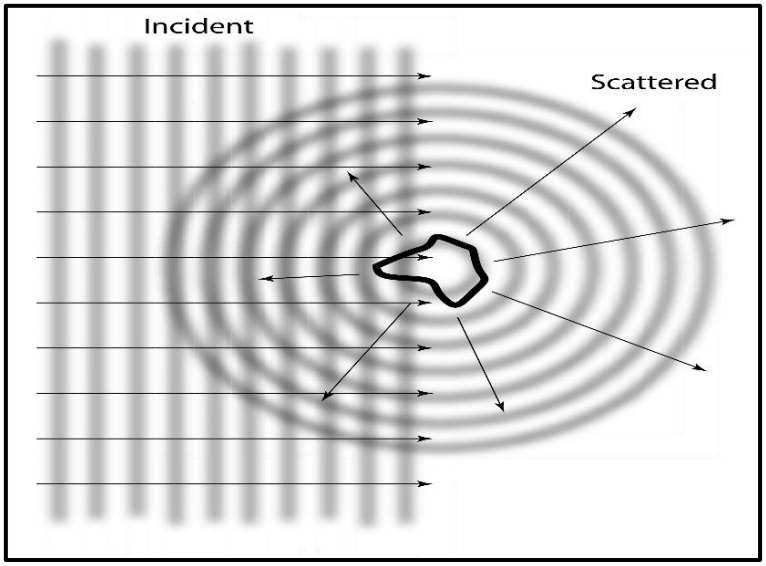


Title : Study of Spin Polarization in Elastic Scattering Of Electron / Positron From Atoms / Molecules)

By: Dr. Kapil Kumar Sharma (Applied Science)

Summary

It allows scientists to probe the magnetic properties, electronic structure, and spin-related phenomena of heavy atoms and materials, leading to advancements in various scientific and technological areas.



The study of spin polarization in the elastic scattering of heavy atoms is a versatile and interdisciplinary field with applications ranging from fundamental research in quantum mechanics to practical technologies in materials science, electronics, and quantum information.

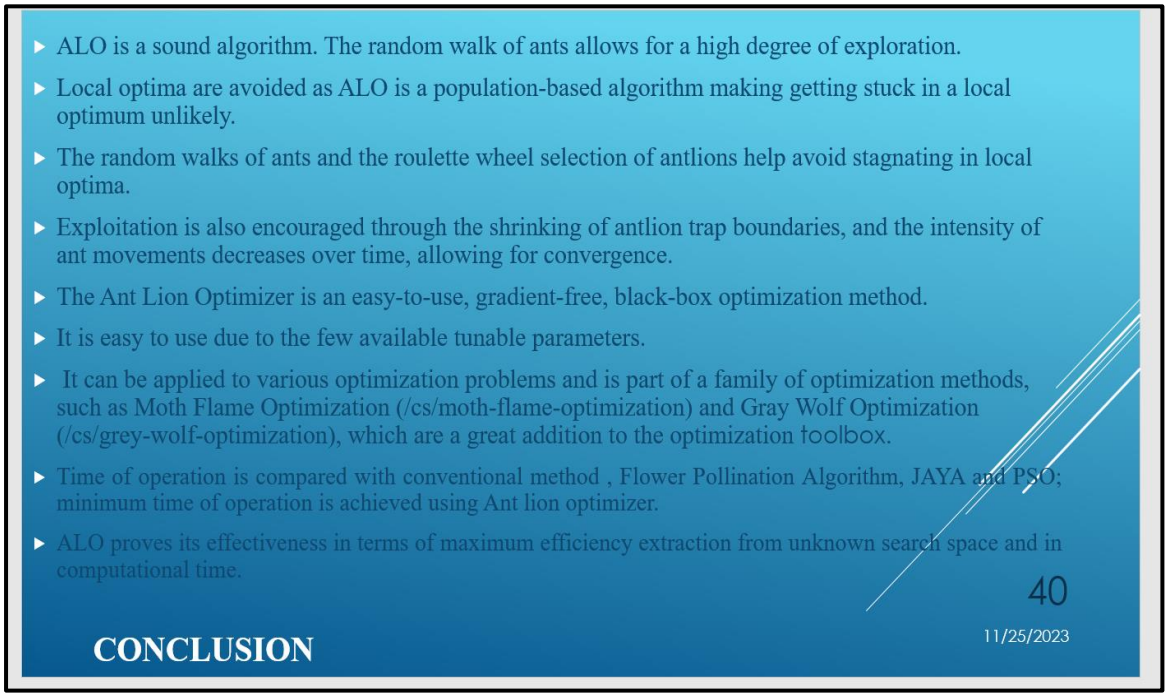
In summary, the study of spin polarization in the elastic scattering of electrons or positrons from atoms and molecules offers valuable insights into the fundamental properties of matter and has applications in diverse fields, from materials science to astrophysics. It allows scientists to probe the quantum nature of particle interactions and gain a deeper understanding of atomic and molecular systems.

1. Elementary particles have been discovered by scattering experiments.
2. Determination of charge balance and transport prosperities of electrons in low-temperature gases in plasma.
3. Evaluating the rate coefficient of various transitions involved in plasmas.
4. Control the composition of lower and upper atmosphere.
5. Study the positronium formation etc.
6. Electron scattering is important for modeling thin film deposition, plasma etching, and doping in the semiconductor industry.

Title: Ant Lion Optimization Technique

By: Dr. Amit Kumar Gupta, Professor (MCA)

ALO is a sound algorithm. The random walk of ants allows for a high degree of exploration. Local optima are avoided as ALO is a population-based algorithm making getting stuck in a local optimum unlikely.



Summary

Time of operation is compared with conventional method, Flower Pollination Algorithm, JAYA and PSO; minimum time of operation is achieved using Ant lion optimizer.

ALO proves its effectiveness in terms of maximum efficiency extraction from unknown search space and in computational time.

Identified Thrust area of Research

Add topic of relevant thrust area of research or write the name of ITRA

- The goal for the antlions is to capture ants. Antlions represent solutions to the optimization problem. We represent antlions with a matrix.
- Antlions dig pits, which act as traps, into which ants can stumble. In this way, antlions affect the random walk of ants.
- We model this behaviour by having the random walk of the ants affected by the antlions.
- The random walk of ants, modelled to include the effect of antlion traps.
- Ants are search agents that randomly walk through the space. We score ants using a fitness function as they walk between antlion traps.
- Ants move through the world using a stochastic policy. We use a random walk. The goal for the ants is to avoid the antlions.

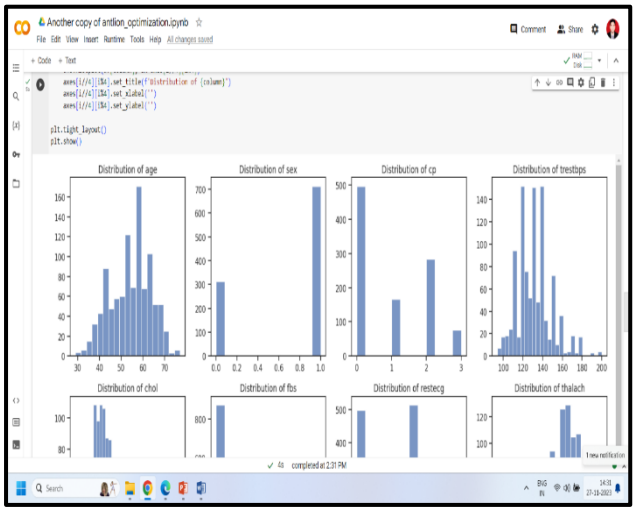
- The random walk of an ant is computed using the following equation:

$$X(t) = [0, cumsum(2r(t_1) - 1), cumsum(2r(t_1) - 1), .., cumsum(2r(t_n) - 1)] \quad (1)$$

In this case $cumsum$ is the cummulative sum function. We also use a random function $r(t)$ which we show below:

$$r(t) = \begin{cases} 1, & \text{if } rand > .5 \\ 0, & \text{if } rand \leq .5 \end{cases} \quad (2)$$

-
- Ants move around the search space using different random walks.
- Random walks are applied to all the dimension of ants.
- Random walks are affected by the traps of antlions.
- Antlions can build pits proportional to their fitness (the higher fitness, the larger pit).
- Antlions with larger pits have the higher probability to catch ants.
- Each ant can be caught by an antlion in each iteration and the elite (fittest antlion).
- The range of random walk is decreased adaptively to simulate sliding ants towards antlions.
- If an ant becomes fitter than an antlion, this means that it is caught and pulled under the sand by the antlion.
- An antlion repositions itself to the latest caught prey and builds a pit to improve its change of catching another prey after each hunt.



Title: Co-Composting and Vermicomposting of Coal Fly Ash and Press Mud Changes in Nutrients, Micro-Nutrients and Enzyme Activities

By: Dr. Minakshi Karwal Associate Professor (Applied Sciences)

Summary

Vermicomposting is a better biodegradation method in comparison to the composting method in terms of nutrient dynamics, heavy metal remediation, and growth and development of tomato plants. Moreover, it was observed that time reduction can be done, using co-composting.

Identified Thrust Area of Research

Vermicomposting and composting

This study was done to compare the impact of composting and vermicomposting on the stabilization of organic waste and the quality of the organic manure produced that has an impact on man and its environment. It was observed that the vermicomposting method has significantly reduced the heavy metals from the waste substrate than the composting method, moreover, the application of the vermicomposting process on waste management has a promising role in enhancing sustainability and may contribute in reaching one step forward towards SDG goal needed to be reached by 2030 as described by UN and accepted by our Nation India. Through this technology the major SDG goals like zero hunger, clean water sanitation, climate action, responsible production and consumption and sustainable cities and communities, life above land can be taken forward.

The present study has yielded significant advancements in the realm of sustainable development and has the potential to reduce the impact of waste management through advanced waste management technology like Vermi technology and using the amendment in the process as well.

- It is concluded from the present study that the vermin-stabilization of industrial and agricultural wastes like fly ash and press mud can be successfully done, using *E. fetida.*
- Buffalo dung proved to be an efficient bulking agent for the fecundity of earthworms and vermin-processing of other waste in the substrate.
- The earthworm species *E. fetida* effectively bioaccumulated the heavy metals (Cu, Zn, Pb, Cr, Co, Cd, and As) present in the substrate, thus reducing the toxic effect due to heavy metal present in the waste substrate. More than 40 % decrease in heavy metal was observed in the final vermicompost.
- During the study it was observed that vermicompost produced was more effective than produced compost in terms of physico-chemical characteristics (pH, EC, and CN ratio), and nutritional content (TN, Na, Ca, K, and P).
- The seed germination index, plant height, and number of fruits produced also got enhanced in vermicompost-treated experimental pots.
- The vermicompost produced through opted waste, thus enhances the physical properties of soil like porosity, aeration, and water holding capacity. This reported good productivity potential of the tomato plant (*Solanum lycopersicum).* The vermicompost produced was found to have good potential to enhance the quality of soil.

- GHG emission was significantly reduced during vermicomposting in comparison to composting throughout the study period.
- In the present study enzymatic activities were also observed higher in vermicompost in comparison to compost on the 30th day.
- Based on the findings, some recommendations have been made regarding the use of suitable additives, bulking agents, proportion of the feedstock components, and pre-composting. Vermitechnology thus opens new avenues for environmentally sustainable solid waste management with several benefits. The interdisciplinary clubbing like mathematical modeling and environmental toxicology holds immense potential for interdisciplinary research collaborations with various departments. These partnerships can enhance data analysis, and optimization, and develop innovative solutions to address the challenges of sustainable energy management. Together, we can pave the way for a more efficient and sustainable energy future.

Title: Heart-Disease Diagnosis via Support Vector Machine-Based Approaches

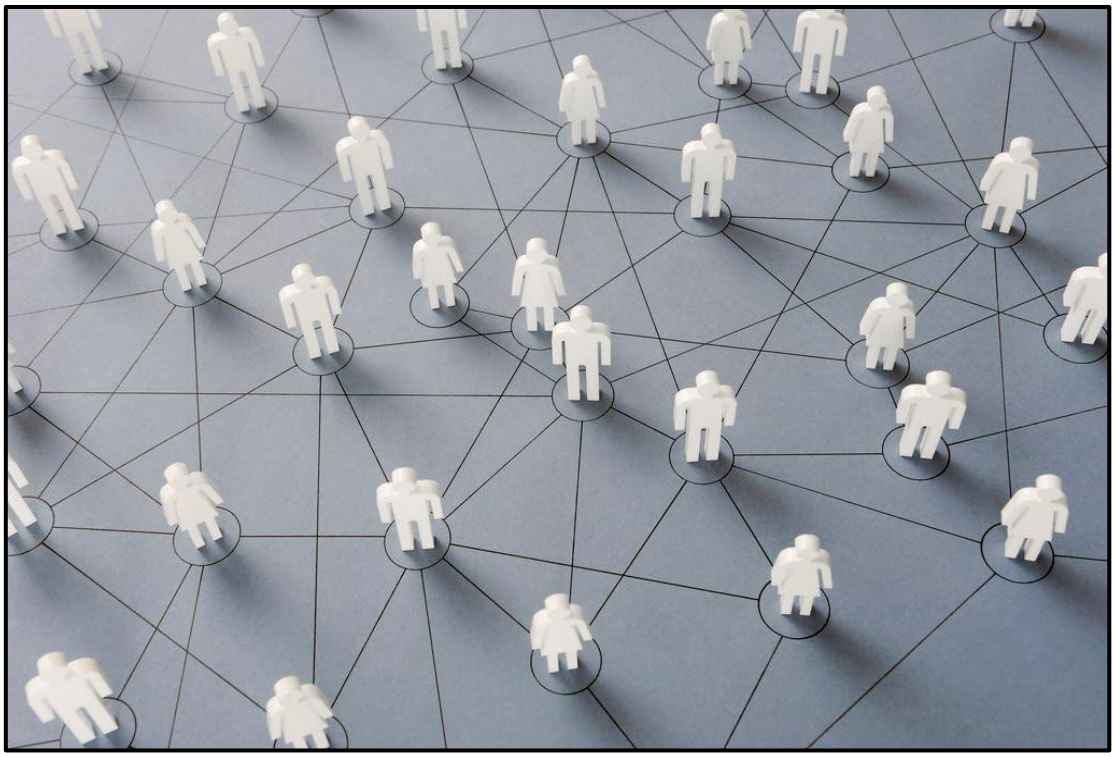
By: Prof. Akash Rajak (MCA)

Summary

Heart disease diagnosis is widely studied by researchers all over the world since it is the primary cause of death. There exist many challenges in heart disease diagnosis, such as huge amounts of data, high data dimension, large noise interference, etc, which point to the suitability of using data-driven approaches.

Identified Thrust Area of Research

Machine Learning,
Data-driven, SVM, SVM-RFE, PCA-SVM, heart
Disease.



With the aging of the population, the incidence of heart disease which are caused by continuous increase of cardiovascular disease risk factors, such as obesity, diabetes and little exercise, is staying at a high level, and health of human beings is seriously threatened by the heart disease as a highly lethal disease. In the United States, more than 300,000 people died because of sudden death every year. It is more than 50% of all heart disease deaths and 1‰ of the total population respectively. According to the report of the World Health Organization in March 2013, cardiovascular disease is the primary reason of death in the world. That means the number of deaths from cardiovascular disease is more than any other cause. Death from cardiovascular disease accounts for 30% of the global deaths. Especially in middle and low-income countries, more than 80% of people die of cardiovascular disease. Experts predict that the number of deaths from cardiovascular disease will grow to 23.6 million by 2030, and it is still the main cause of death.

Recently, data-driven approaches have been extensively applied in many fields. Using data-driven approaches to diagnose heart diseases has also received lots of attention from researchers globally. However, many challenges, such as huge amounts of data,

high data dimension, large noise interference, etc, still exist in heart disease diagnosis. Moreover, it is extremely necessary to determine what kind of features play decisive roles in heart disease diagnosis. In this research, the heart-disease database downloaded from a repository of the University of California at Irvine (UCI) is introduced into original SVM classifiers with different kernels. In the meanwhile, two kinds of dimension reduction

methods named SVM-RFE, and PCA-SVM are utilized to compare the results. In this research, original SVM, SVM-RFE, and PCA-SVM with different kernels are utilized to diagnose the abnormal situation of heart disease with the database which is downloaded from repository of UCI. By using the SVM-RFE method, the most relevant feature is obtained. It shows very good performance when feeding RBF kernel classifier with the first 11 relevant features, and 85.29% accuracy is achieved. It is 2.94% higher than the one based on the original SVM with the optimal kernel (RBF kernel). However, PCA-SVM with RBF kernel obtains the best results (88.24%) by using only the first 6 principal components. It is not only 5.89% higher than the one based on the original SVM with RBF kernel, but also 2.95% higher than the classification accuracy obtained by SVM-RFE via optimal kernel. The work in this research shows that it is feasible to improve the diagnosis accuracy of heart disease by reducing redundant information of the database.

Title: Size Optimization of Renewable Energy Systems- Prof. Ameer Faisal (EN)

Identified Thrust Area of Research

The HOMER modelling technique was employed to calculate the COE and NPC

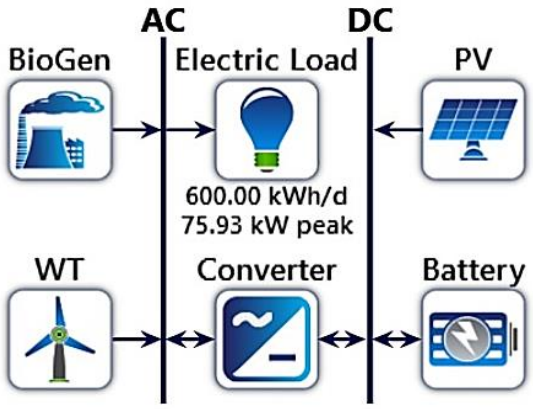
In recent years, fossil fuels have ban been the primary source of power generation worldwide. However, they contribute significantly to greenhouse gas emissions and global warming. As a result, there is a growing need for clean, sustainable, and reliable energy due to various technical, environmental, and economic concerns. Renewable energy sources (RES) such as solar, wind, biomass, and biogas are becoming increasingly popular for power generation globally. Hybrid systems, which incorporate two or more RES, are more efficient due to the unpredictable nature of RES, climatic conditions, and cost. These systems reduce carbon emissions and offer more efficient, economical, and reliable power systems. Optimal design or sizing of hybrid system components is crucial to effectively utilize RES at minimum cost and maximum reliability.

In the modeling process, HOMER uses a list of system configurations and their capacities, which are sorted based on the lowest COE and NPC, to estimate the cost and determine the

viability of hybridized energy systems throughout the years. Following the hourly simulation, various HRES configurations were produced, as depicted in Fig. In this study, three different scenarios are assessed to determine the best system configuration among a variety of configured energy systems. Below, both technically and economically, are discussed:

Configuration-1 PV-WT-Bio-Gen-Battery: PV, biogas, and WT generators are the energy sources designated in configuration 1 for supplying the required energy demand in the study region. The lowest NPC is found to be 66.8M, and the lowest COE is found to be 17.24 ₹/kWh at 0% capacity shortage. Compared to the predicted annual energy requirement of 219000 kWh, the size of the systems taken into consideration by PV, WT generators, and biogas with batteries is 546 kW, 45 kW, 84 kW, and 1004 respectively. The overall cast summary of all components is shown in **Figure 8.**

Combination 2 PV-Bio-Gen-Battery: SPV, biogas, and battery are considered. While the expected annual energy requirement is 21900 kWh, the system sizes for PV, biogas, and the number of batteries are 698 kW, 840 kW, and 1050 no., respectively. Although this system has an NPC found to be 68.4M, and COE is found as 17.66 ₹/kWh. It has a little greater capital expense. It is clear from the explanation above that Combination 2 is nearly like Combination 1 in terms of both economy and environment.



Combination 3 WT-Bio-Gen-Battery: In this combination, the battery, WT generator, and Biogen systems are all considered. The size of the systems considered as WT generator, Bio-Gen, and the number of batteries is 603 kW, 840 kW, and 3894 numbers, respectively. The results also show that compared to the first two scenarios, the WT generator, Bio-Gen, and battery hybrid generate more extra energy.

Title: Shadow Filters in Fractional Domain

Dr. Garima Varshney, Assistant Professor, ECE

Summary

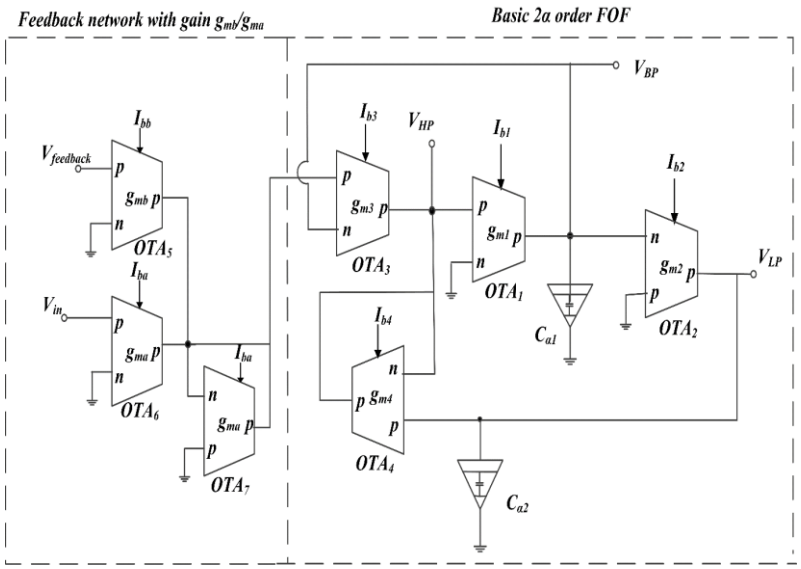
Two multi-functional shadow FOFs are presented and verified via SPICE with 180nm CMOS parameters.
The FOF parameters such as f0 and Q are tuned with the help of the external amplifier's gain, without changing the active or passive components of basic FOF.

Case-1 of FHPF feedback fixed Q and variable f0.

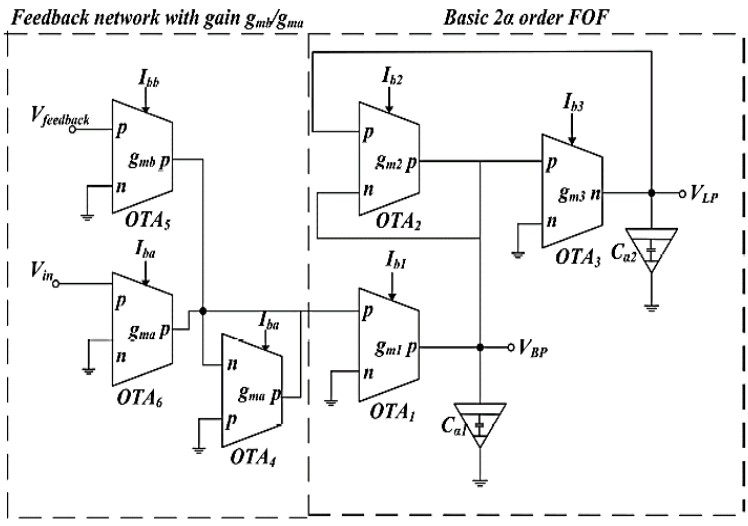
Case-2 of FLPF feedback Q and f0 are both variables.

Case-3 of FBPF feedback fixed f0 and variable Q.

The robustness has been validated using THD, Monte-Carlo, and corner analyses.



Shadow FOF circuit I



Shadow FOF circuit II

The theory of integer-order shadow filters is generalized to the fractional domain. The counterpart of integer-order shadow filters in the fractional domain are called as shadow FOFs. Mathematical equations have been drafted to determine ω0 and Q when different types of feedback signals, such as low-pass, high-pass, band-pass, or band-stop, are applied to the external amplifier in the feedback loop. The proposed theory has been demonstrated using MATLAB simulations. To verify the proposed theory, two active shadow FOFs are presented using a basic FOF and an external amplifier with gain A in the feedback loop. Both the shadow FOFs are built around OTA. SPICE simulations are carried out to verify the functionality of the proposed shadow FOFs using 180 nm CMOS technology model parameters.

The theory of integer-order shadow filters is generalized to the fractional domain. Mathematical equations have been drafted to determine the pole frequency and pole quality factor when different types of feedback signals, such as low-pass, high-pass, band-pass, or band-stop, are applied to the external amplifier in the feedback loop and demonstrated using MATLAB simulations. The proposed theory is verified through SPICE simulations using two active FOFs and found that the results fit in the theoretical predictions very well. The shadow FOF's parameters such as ω′0 and Q′ are tuned with the help of the external amplifier's gain, without changing the active or passive components of the basic FOF. For both of the shadow FOF circuits the THD is found to be below 4%. Further, corner and Monte-Carlo analyses have been performed to verify the robustness of the shadow FOF circuits.

Title: Techniques to Improve Image Quality

Dr. Upendra Kumar Acharya, Assistant Professor (ECE)

Summary

It is one of the significant image processing techniques for improving the image quality and making the image good enough for further processing and interpretation. Identified Thrust area of Research Medical Imaging Microscopic imaging, Underwater imaging,

The quality of the image is degraded due to the poor light environment. Non-uniform illumination, imperfect image acquisition, low-quality camera sensor, noise, distance between camera sensor and target, aperture size, and shutter speed, so to improve the quality of such images, the image enhancement technique is used in image processing. The process of transformation of a degraded low-quality input image to an image with better quality is known as the image enhancement technique. In medical applications, a small loss of information from the medical images makes the scientific evaluation wrong, hence the diagnosis becomes

more complicated. It is used to upgrade the perception of objects in an image without any information loss. By taking the discussed research gaps into mind, some objectives are proposed which emphasize meeting the challenges like, improving the visual quality along with minimizing the information loss, preserving the brightness, improving the contrast and minimizing the artifacts. It may be utilized as a preprocessing technique in, Traffic information collection, Drones camera, Process monitoring camera, CCTV, security purpose,

Fig. 1 (a) Image-1, (b) HE based image [1], (c) Histogram of Image-2, (d) Histogram of HE image

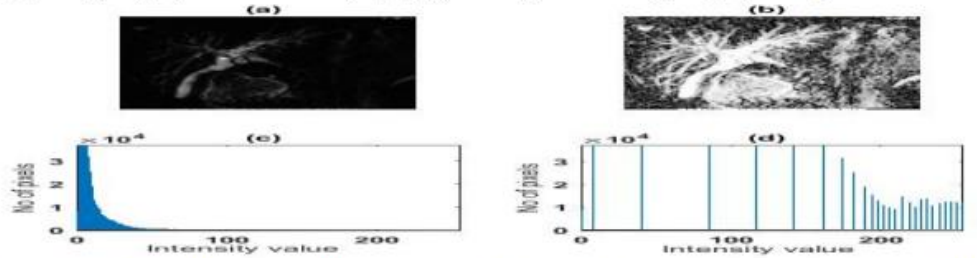
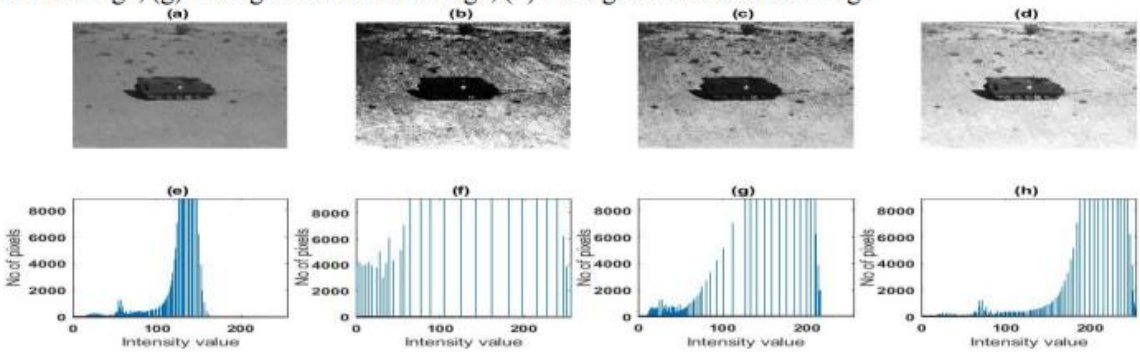


Fig. 2 (a) Image-2, (b) HE [1], (c) BBHE [2], (d) AGCWD [32], (e) Histogram of image-2, (f) Histogram of HE image, (g) Histogram of BBHE image, (h) Histogram of AGCWD image



Intelligent surveillance systems, Satellite imaging, Microscopic imaging, Underwater imaging, Vehicle detection, Fingerprint recognition, MRI, CT imaging, mammogram imaging and retinal fundus imaging.

Title: Automated Diagnosis of Tumor from Medical Imaging Using Computer Techniques

By: Dr. Laxman Singh, Associate Professor (CSE, AI&ML)

This presentation aims to present important image processing-based segmentation methods, which could be quite useful for developing efficient computer-aided diagnosis systems to detect early signs of breast cancer in mammographic images.

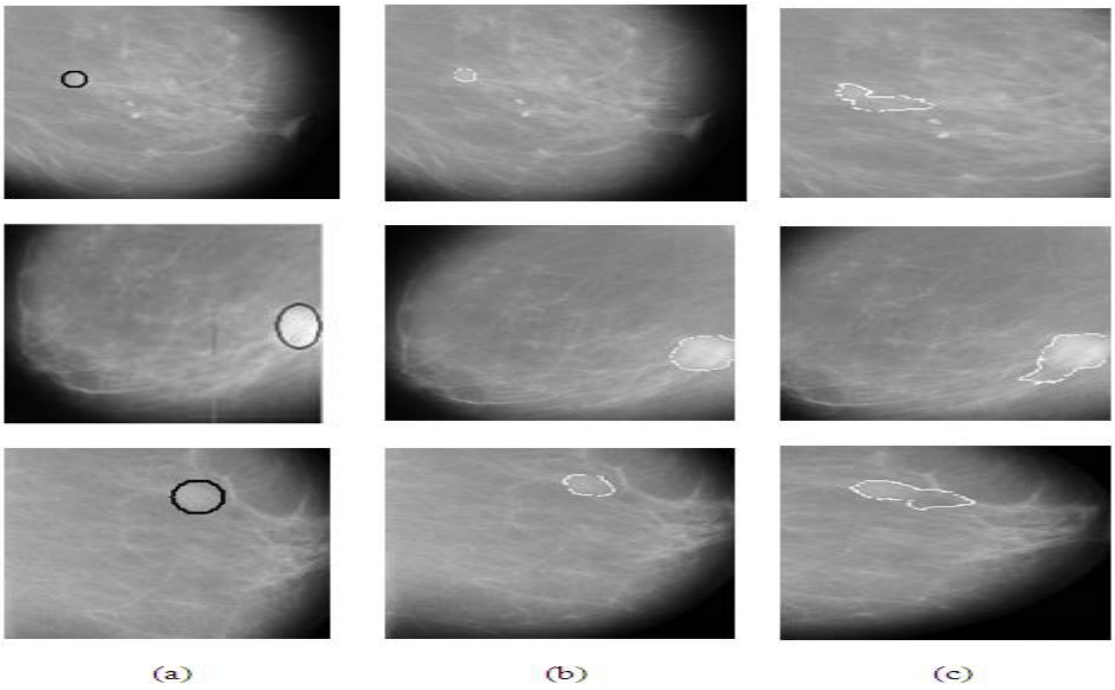
Summary

Identified Thrust area of Research

In this study, authors present important image processing-based segmentation methods, which could be quite useful for developing efficient computer aided diagnosis systems to detect early sign of breast cancer in mammographic images. In this study, authors obtained the promising results, which are quite helpful in interpretation of digital mammograms.

Table 4.3 Comparison of different tumor area (extracted by MRGS and MCWS method) with an expert radiologist results.

Sample no.	Area (MRGS) (mm^2)	Area (MCWS) (mm^2)	Area (Expert radiologist) (mm^2)	Relative error (%) (MRGS)	Relative error (%) (MCWS)
01	27.8	24.2	26.5	4.9	8.7
02	75.6	83.3	77	1.8%	8.2%
03	58	57.8	61	4.9%	5.2%



In the year 2018, about 82000 women died in India due to breast cancer more than any other country in the world. In the year 2019, several deaths reported in China and the US were 52084 and 53009, respectively.

A study carried out by GE Healthcare estimated that the incidence of new cases of breast cancer in India will increase from today's figure of 115,000 to 200,000 by the year 2030.

In the screening process, each mammogram is examined carefully for any visual sign of abnormality by the expert radiologists. In daily routine, many mammograms are analyzed by radiologists making the process error prone, cost ineffective, and time consuming. In 10-30% of the cases, abnormalities are missed even by experienced radiologists due to the heavy workload on each radiologist. The main processes involved in computer-aided diagnosis systems are image pre-processing, mass detection, and mass classification.

Title: Antinutrient Raffinose Oligosaccharides in plants: Structure, biosynthesis, Accumulation, and Impact on Human Health

By: Dr. Garima Kapoor, Assistant Professor (KSoP)

Raffinose family oligosaccharides (RFOs) are widespread across the plant kingdom, and their concentrations are related to the environment, genotype, and harvest time. RFOs are known to carry out many functions in plants and humans. In this paper, we provide a comprehensive review of RFOs, including their beneficial and anti-nutritional properties. RFOs are considered anti-nutritional factors since they cause flatulence in humans and animals. Flatulence is the single most important factor that deters the consumption and utilization of legumes in human and animal diets. In plants, RFOs have been reported to impart tolerance to heat, drought, cold, salinity, and disease resistance besides regulating seed germination, vigor, and longevity. In humans, RFOs have beneficial effects in the large intestine and have shown prebiotic potential by promoting the growth of beneficial bacteria reducing pathogens and putrefactive bacteria present in the colon. In addition to their prebiotic potential, RFOs have many other biological functions in humans and animals, such as anti-allergic, anti-obesity, anti-diabetic, prevention of non-alcoholic fatty liver disease, and cryoprotection. The wide-ranging applications of RFOs make them useful in food, feed, cosmetics, health, pharmaceuticals, and plant stress tolerance. Therefore we review the structure, compositions, biosynthesis, accumulation, and impact on human health from published research on topic of plant- based antinutrients.

Innovation Spotlights of the Month

Wearable tech integration

Wearable tech integration allows pharma companies to do more than just manufacture, market, and sell drugs. The technology gives patients greater power to manage their conditions and make critical decisions.

Daiichi-Sankyo, a Japanese drugmaker, and Partners HealthCare Center teamed up to implement the use of wearables. The two institutions created a device coined "the mobile wrap-around," which monitors patients diagnosed with atrial fibrillation and sends feedback to doctors.

Roche is another early adopter of wearable tech integration. The company paired its mySugr app with the Accu-Chek Guide glucose meter, enabling people with diabetes to experience a different, more responsive way to manage the condition.

With the device, patients can log in and complete simple tasks, which allows them to keep track of their glucose levels. The approach is unique, practical, and effective offering a better experience for patients than simply waiting around for answers.

Source: www.masschallenge.org

CSL, Kochi Launches First Three ASW Shallow Watercraft for Indian Navy

On a momentous occasion at Cochin Shipyard Limited (CSL), Kochi, the Indian Navy witnessed the launch of the first three ships of the Anti-Submarine Warfare (ASW) Shallow Watercraft (SWC) project. Mahe, Malvan, and Mangrol, the initial trio of the eight-vessel project, were unveiled on 30th November 2023.

In adherence to maritime traditions, Mrs. Anjali Bahl launched Mahe in the presence of VAdm Puneet Bahl, Commandant INA. Similarly, Malvan was launched by Mrs. Kangana Berry in the presence of VAdm Suraj Berry, C-in-C, and Mangrol saw its launch by Mrs. Zarine Lord Singh in the presence of VAdm Sanjay J Singh, Vice Chief of Naval Staff.

The Mahe class ASW Shallow Watercrafts derive their names from ports strategically significant along India's coast. These ships aim to carry forward the illustrious legacy of their namesakes, the erstwhile minesweepers. The naming ceremony was accompanied by the invocation from Atharva Veda.

The contract for constructing these eight ASW SWC ships was signed between the Ministry of Defense and Cochin Shipyard Limited on 30th April 2019. These vessels are set to be equipped with indigenously developed, state-of-the-art underwater sensors, designed for anti-submarine operations in coastal waters, Low Intensity Maritime Operations (LIMO), and Mine Laying Operations.

The ASW SWC ships, measuring 78 meters in length with a displacement of approximately 900 tons, boast a maximum speed of 25 knots. The simultaneous launch of three ships of the same class underscores significant progress in indigenous shipbuilding, aligning with the vision of 'Aatmanirbhar Bharat.' The first ship from this project is scheduled for delivery in 2024.

Crucially, these ASW SWC ships are set to achieve over 80% indigenous content, a testament to the commitment to large-scale defense production within Indian manufacturing units. This milestone not only generates employment but also enhances the country's capabilities, showcasing a significant stride toward self-reliance.

Source: https://www.gktoday.in/csl-kochi-launches-first-three-asw-shallow-water-craft-for-indian-navy/

KIET (R&D) Policies

The promotion of research culture with the formulation of policies by the R&D Committee is as follows:

- KIET Research Policy
- KIET Ethics Policy for Students and Faculty Members
- CV Raman Award Policy
- Policy for KIET Research Faculty Members
- Guidelines for Organizing International Conferences in Institute
- Departmental Research Committee
- KIET Policy for Research Proposals/Grants
- KIET Policy for Research Guidance/Ph.D. Guidance for Improving Research Culture

For details, kindly refer -
https://www.kiet.edu/Research%20and%20Development%20Policy

Membership of Professional Societies

- All KIET faculty members with more than 05 SCI/SCI-E/SSCI research papers with KIET Group of Institutions affiliation and membership in national and international professional societies are eligible for 75% reimbursement of membership registration fees.
- No life membership fees will be reimbursed for any professional society or association.
- A maximum of Rs. Eight thousand (Rs. 8000) will be paid for both national and international society membership.
- An Incentive claim under the Research Incentive Schemes (RIS) of KIET must be made within a month of registration with the professional bodies in the prescribed form. (**Annexure VII of KIET Research Policy**).

1. PhD- Fee Reimbursement, OD & Incentives

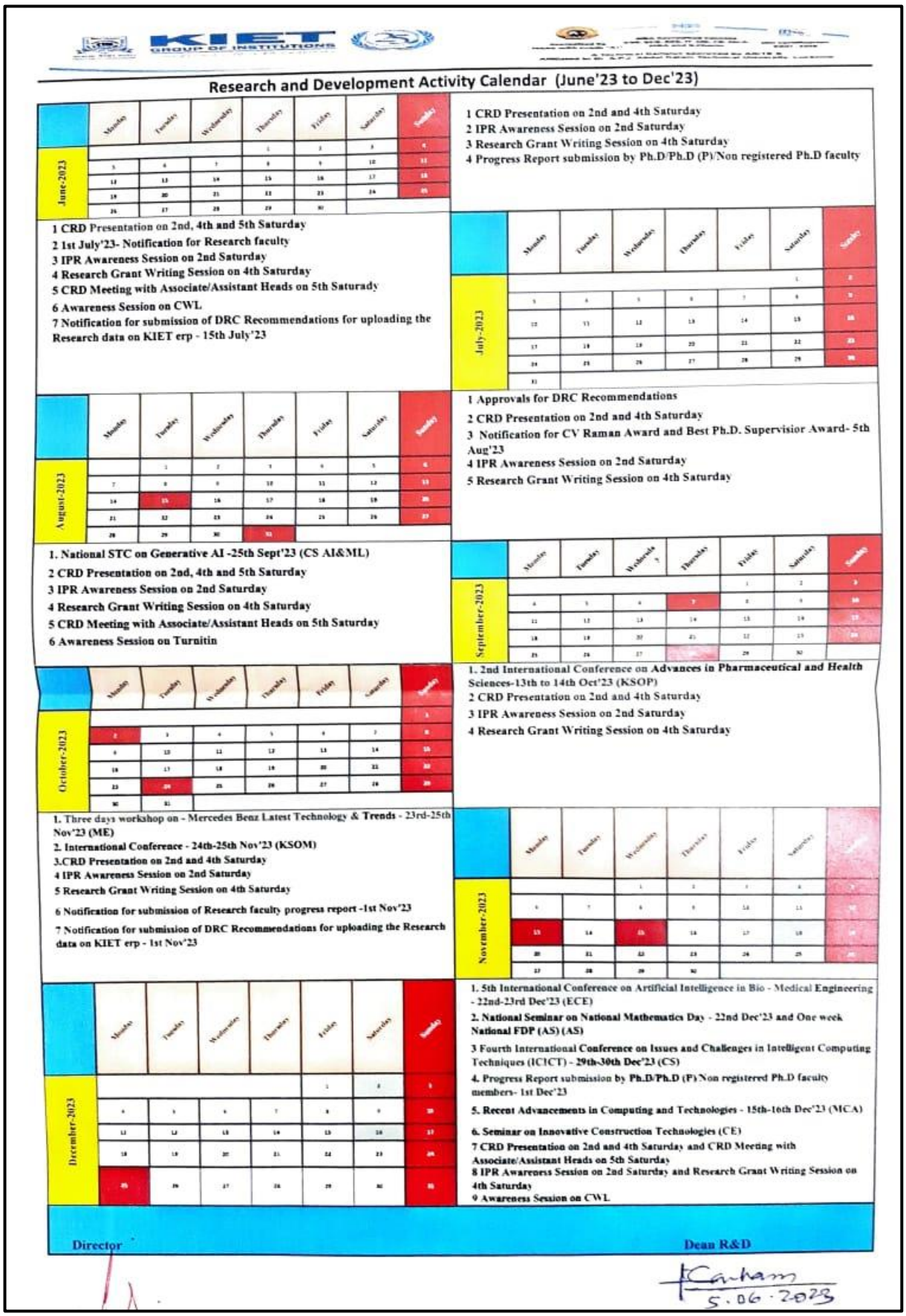
For more details, kindly refer to the Policy for Research Guidance/ Ph. D Guidance for Improving Research Culture issued by the Director Office on 25th Aug'21.

S. No.	Category	Ph.D. Benefits	Requirements/Conditions
1.	Ph. D (Part-Time) Fee Reimbursement	On acquisition of the Ph.D. from Institutes/universities of repute (IISc Bangalore, IITs, JNU, NITs, IIITs, and Central Universities of repute), a faculty may	Faculty members entering service without a Ph.D. shall be encouraged to enroll themselves/acquire a Ph.D. in the relevant branch/discipline from Institutes/ Universities of repute (IISc Bangalore, IITs, JNU, NITs, IIITs, and Central Universities of repute).

		avail Ph.D. tuition fee reimbursement on an actual basis but not exceeding Rs. 30,000/- per year (on prorate basis with salary) for three years after fulfilling conditions as mentioned.	One needs to claim the Ph.D. tuition fee reimbursement within a month after the award of the degree by submitting a copy of the degree certificate and tuition fee paid slips. Two Research Publications in SCI Journals with the affiliation as "KIET Group of Institutions, Delhi- NCR, Ghaziabad" (Annexure B). Faculty should submit the undertaking for serving the Institute for at least one year. In case of non-fulfillment of serving for one year, faculty members should refund the reimbursed Ph. D. tuition fee.
2.	ODs	The maximum total number of ODs for completing a Ph.D. is 12 per academic year/leave year for a maximum of 4 years. A maximum of 3 ODs at a stretch can be given to a faculty member in a month at the discretion of HoD (provided there is no academic loss of students) just after the Ph. D registration. Faculty may avail of the facility of OD for pursuing Ph.D. immediately post joining KIET. If the course work of Ph.D. program falls during summer break, then faculty must consume their summer vacation first (two weeks) and rest will be treated as OD provided the count	Faculty members entering service without a Ph.D. shall be encouraged to enroll themselves/acquire Ph.D. in the relevant branch/discipline from Institutes/ Universities of repute (IISc Bangalore, IITs, JNU, NITs, IIITs and Central Universities of repute). One needs to claim the Ph.D.tuition fee reimbursement within a month after award of degree by submitting a copy of degree certificate and tuition fee paid slips. Two Research Publications in SCI Journals with the affiliation as "KIET Group of Institutions, Delhi- NCR, Ghaziabad" (Annexure B). Faculty should submit the undertaking for serving the Institutefor at least one year. In case of non-fulfillment of serving for one year, faculty member should refund the reimbursed Ph. D tuition fee.

		remains 12 ODs per academic/ leave year. For completing the course work 3-4 months Leave without pay (LWP) can be given to faculty members at the discretion of HoD provided There is no academic loss of students and the department will be able to manage without any substitute.	
3.	Incentives on Award of Ph.D. Degree	Five increments shall be admissible at the entry-level of recruitment to faculty members possessing the degree of Ph. D (full time), awarded in the relevant discipline from Institute/ University of repute (IISc Bangalore, IITs, JNU, NITs, IIITs, and Central Universities of repute). Faculty members who complete their Ph.D. degree (part-time) while in service shall be entitled to three increments.	Ph.D. is in the relevant branch/discipline and has been awarded by a university and two Research Publications in SCI Journals with affiliation as "KIET Group of Institutions, Delhi-NCR, Ghaziabad". One needs to claim the Ph. D incentives within a month after the award of the degree by submitting a copy of the degree certificate/provisional degree certificate. The Ph.D. incentives in terms of increments will be applicable from the date of submission of the application copy along with the copy of the degree certificate/provisional degree certificate. During recruitment, if the faculty intimates that the Ph. D thesis has been submitted, then the faculty will have to complete the Ph. D within one year for entitlement of five increments else three increments would be awarded.

Research and Development Activity Calendar (June 2023 – Dec. 2023)



KIET GROUP OF INSTITUTIONS

Research and Development Activity Calendar (June'23 to Dec'23)

June-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

1 CRD Presentation on 2nd, 4th and 5th Saturday
2 1st July'23- Notification for Research faculty
3 IPR Awareness Session on 2nd Saturday
4 Research Grant Writing Session on 4th Saturday
5 CRD Meeting with Associate/Assistant Heads on 5th Saturady
6 Awareness Session on CWL
7 Notification for submission of DRC Recommendations for uploading the Research data on KIET erp - 15th July'23

1 CRD Presentation on 2nd and 4th Saturday
2 IPR Awareness Session on 2nd Saturday
3 Research Grant Writing Session on 4th Saturday
4 Progress Report submission by Ph.D/Ph.D (P)/Non registered Ph.D faculty

July-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

August-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

1. National STC on Generative AI -25th Sept'23 (CS AI&ML)
2 CRD Presentation on 2nd, 4th and 5th Saturday
3 IPR Awareness Session on 2nd Saturday
4 Research Grant Writing Session on 4th Saturday
5 CRD Meeting with Associate/Assistant Heads on 5th Saturday
6 Awareness Session on Turnitin

1 Approvals for DRC Recommendations
2 CRD Presentation on 2nd and 4th Saturday
3 Notification for CV Raman Award and Best Ph.D. Supervisior Award- 5th Aug'23
4 IPR Awareness Session on 2nd Saturday
5 Research Grant Writing Session on 4th Saturday

September-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

1. Three days workshop on - Mercedes Benz Latest Technology & Trends - 23rd-25th Nov'23 (ME)
2. International Conference - 24th-25th Nov'23 (KSOM)
3.CRD Presentation on 2nd and 4th Saturday
4 IPR Awareness Session on 2nd Saturday
5 Research Grant Writing Session on 4th Saturday
6 Notification for submission of Research faculty progress report -1st Nov'23
7 Notification for submission of DRC Recommendations for uploading the Research data on KIET erp - 1st Nov'23

1. 2nd International Conference on Advances in Pharmaceutical and Health Sciences-13th to 14th Oct'23 (KSOP)
2 CRD Presentation on 2nd and 4th Saturday
3 IPR Awareness Session on 2nd Saturday
4 Research Grant Writing Session on 4th Saturday

November-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

December-2023

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

1. 5th International Conference on Artificial Intelligence in Bio - Medical Engineering - 22nd-23rd Dec'23 (ECE)
2. National Seminar on National Mathematics Day - 22nd Dec'23 and One week National FDP (AS) (AS)
3 Fourth International Conference on Issues and Challenges in Intelligent Computing Techniques (ICICT) - 29th-30th Dec'23 (CS)
4. Progress Report submission by Ph.D/Ph.D (P) Non registered Ph.D faculty members- 1st Dec'23
5. Recent Advancements in Computing and Technologies - 15th-16th Dec'23 (MCA)
6. Seminar on Innovative Construction Technologies (CE)
7 CRD Presentation on 2nd and 4th Saturday and CRD Meeting with Associate/Assistant Heads on 5th Saturday
8 IPR Awareness Session on 2nd Saturday and Research Grant Writing Session on 4th Saturday
9 Awareness Session on CWL

Director

Dean R&D

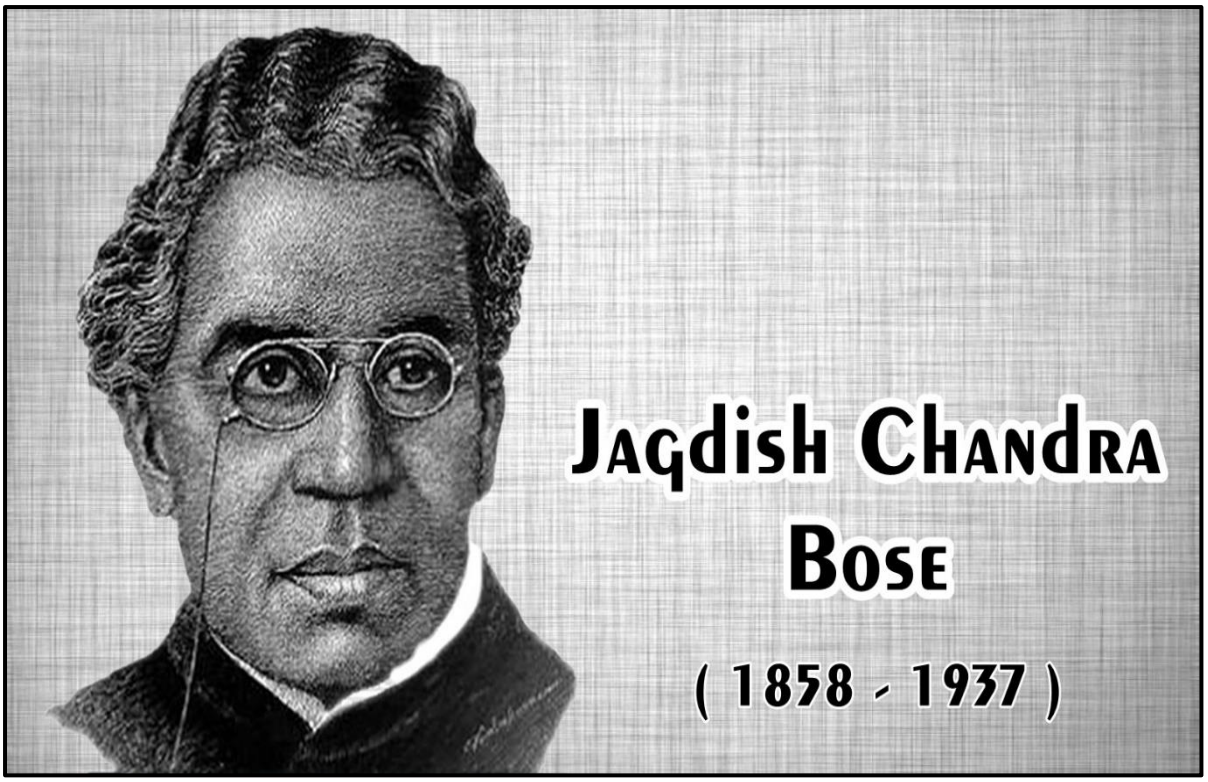
5.06.2023

Various Research Labs in KIET

S. No.	Research Lab/Centre of Excellence	Department
1	Centre of Robotics and Mechatronics	ECE
2	KIET NI LABVIEW Academy	ECE
3	Bio-Medical Instrumentation MBS	ECE
4	Space Technologies	ECE
5	Apple for iOS University Program	IT, CS, MCA
6	D-Link Global Center of Excellence	IT, CS, MCA
7	Centre for Automotive Mechatronics in association with Mercedes Benz	ME
8	CAD/CAM Lab	ME
9	Material Science & Testing Lab	ME
10	IC Engine and Automobile Lab	ME
11	Maker's Space Innovation Lab	All Branches
12	Central Instrumentation Lab	Pharmacy
13	Pharmacology Research Lab	Pharmacy
14	Center of Excellence for Renewable Energy-based Power System for Electrical Power Supply and Transportation	EN
15	Centre of Excellence in the latest art of structural analysis and design facilities viz. STAAD PRO, E-TABS, SAP, ANSYS, PLAXIS, Primavera etc.	CE
16	Centre of Excellence in Process Control and Industrial Automation	EN
17	Finance Lab	MBA


Centres of Excellence
KIET-MBS Research & Development Centre for Bio-Medical Instruments
Centre for Advanced Woodworking
Automotive Mechatronics Centre in Collaboration With Mercedes-Benz India Pvt. Ltd.


A Glimpse of Collaborative Research and Development Presentation
GPS Map Camera
Muradnagar, Uttar Pradesh, India
Civil Department, KIET GROUP OF INSTITUTIONS, ECE Department Boundary Rd,
Lat 28.752196°
Long 77.498299°
GPS Map Camera
Muradnagar, Uttar Pradesh, India
KIET Group of Institutions, IT Department,Muradnagar, Ghaziabad, Uttar
ZT Architecture in 6G
GPS Map Camera
Muradnagar, Uttar Pradesh, India
KIET Group of Institutions, IT Department,Muradnagar, Ghaziabad, Uttar



Bose was a Polymath; a physicist, botanist, biologist, archaeologist and also a reputed writer of science fiction. He championed the investigation of radio and microwave optics, made an important contribution to plant science, and was credited of being the starter of experimental science in the Indian subcontinent.

Acharya Jagadish Chandra Bose returned to India in the year 1885, with a BSc degree from the University of London and Natural Science Tripos from the University of Cambridge. He joined the **Presidency College** of the **University of Calcutta** as a Physics Professor.

In the year 1894, Bose planned to devote himself to pure research. He used a small enclosure close to a bathroom in Presidency College in **Kolkata** to serve as a laboratory. There, he carried out extensive experiments of diffraction, refraction and polarization. He could rightly be called as the inventor of wireless telegraphy.

Acharya Jagadish Chandra Bose demonstrated with experiments that plants too hold life. An instrument was invented by him to record the plant pulses and connected the device to a plant. The plant, connected to the device, with its roots was picked up carefully and dipped in a vessel having bromide, till its stem.

During 1894-1900, Bose did research on radio waves and formed waves as short as 5 millimetres. His works predates that of Guglielmo Marconi who is also associated with the development of radio.

The honours which the great Indian scientist received include Companion of the Order of the Indian Empire in 1903, Knighthood in 1917, Member of the Vienna Academy of Sciences in 1928, Companion of the Order of the Star of India in 1912, Fellow of the Royal Society in 1920, President of the 14th session of the Indian Science Congress in 1927, Member of the League of Nations' Committee for Intellectual Cooperation, etc.

KIET Group of Institutions

Delhi-NCR, Ghaziabad, Uttar Pradesh, India - 201206