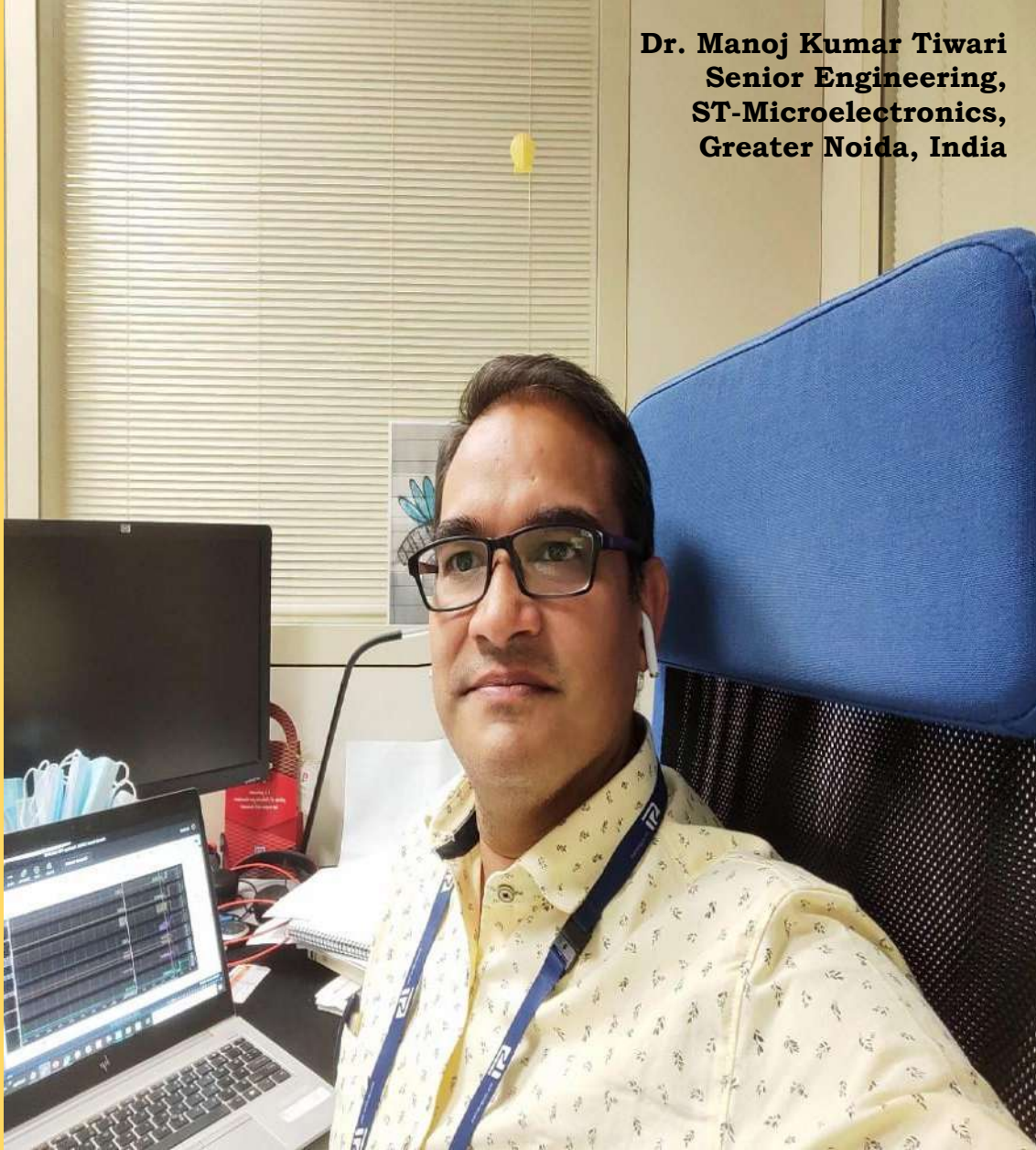# अनुसंधान

(KIET Research Magazine)

**Dr. Manoj Kumar Tiwari
Senior Engineering,
ST-Microelectronics,
Greater Noida, India**

**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 & value-based education as these alumni serve the dual purpose of mentoring the present students, as well as opening new doors for them.

Assistant Dean, Promotion & Implementation of Sustainable Development in Research

Dr. Minakshi Karwal

Associate Prof. (AS)

Assistant Dean, Student Research Promotion in KIET

Dr. Shubham Shukla

Associate Prof. (ECE)

Assistant Dean, Research Quality Assurance

Dr. Himanshu Chaudhary

Assistant Prof. (ECE)

Assistant Dean, Industrial & Academia Research Collaboration & Promotion

Dr. Brijesh Singh

Associate Prof. (EN)

Assistant Dean, Intellectual Property Right (IPR)

Dr. Richa Goel

Associate Prof. (KSOP)

Member Secretary (Intellectual Property Right Committee)

Ms. Surbhi Kamboj

Assistant Prof. (KSOP)

KIET Collaborative Research and Development Committee (CRDC)

Chairman

Dr. Vibhav Kumar Sachan

Prof. & HoD (ECE)

Vice – Chairman

Dr. Vipin Kumar

Prof. & Addl. HoD (AS)

Member-Secretary

Dr. Brijesh Singh

Associate Professor (EEE)

Departmental Research Committee

Associate Heads

Dr. Vipin Kumar, Prof. & Addl. HoD (AS)

Dr. Ashu Mittal, Prof., KIET School of Pharmacy

Dr. Amit Kumar Gupta, Prof., Department of Computer Application

Dr. Dilkeshwar Pandey, Prof., Computer Science Engineering

Dr. Vikas Goel, Prof. & Addl. HoD, Information Technology

Dr. Sapna Juneja, Prof., Computer Science Engineering (AI)

Assistant Heads

Dr. Parvin Kr Kaushik, Professor, Electronics and Communication Engineering

Dr. Manish Bhardwaj, Associate Prof., Computer Science, and Information Technology

Dr. Gaurav Sharma, Assistant Prof., Mechanical Engineering

Dr. Kunal Bisht, Assistant Prof., Civil Engineering

Dr. Harsh Khatter, Assistant Prof., Computer Science

Dr. Varun Gupta, Assistant Prof., Electrical and Electronics Engineering

Dr. Minakshi Tyagi, Assistant Prof., School of Management

CONTENTS

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Message from the Face of Cover Page

Dear Readers,

I am honored to share my thoughts and insights with such a distinguished group of researchers and scholars. As we navigate the complexities of our world today, we must continue to push the boundaries of knowledge and uncover new insights that can help us tackle the challenges we face. Whether it's in the realms of science, technology, or social science, there is always more to learn and discover, and I believe that the researchers at this Institute are at the forefront of this quest for knowledge.

It is believed that research is the foundation of progress, and this magazine certainly helps to inspire and educate the readers on the latest developments and breakthroughs in various areas of research. This issue covered a wide range of topics, including technology, medicine, social sciences, and much more. These articles have been written by experts in their respective fields and are sure to provide you with a wealth of knowledge and insights. The magazine also has a student's section which demonstrates the efforts of students in the research and product development activities.

Also, the research statistics of the institute are very impressive. The statistics presented in the magazine are not just numbers on a page - they are the result of countless hours of meticulous research and analysis. The KIET team has gone above and beyond to ensure that the presented data is not only accurate but also presented in a way that is accessible and meaningful to our readers.

The goal is to provide you with an engaging and informative reading experience that inspires you to think critically and encourages you to explore the world around you. I encourage you to continue exploring the latest developments in your field and to remain committed to the pursuit of knowledge. Whether you are a fellow researcher, a student, or simply someone interested in learning more about our work, there is always something new to discover and explore, and I look forward to seeing the more incredible research work and discoveries that will emerge from this Institute in the years to come.

Best wishes for continued success in the future are sent along with heartfelt congratulations.

Dr. Manoj Kumar Mishra
Senior Engineer
Greater Noida, 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 innovative technologies and solutions, share their findings, and disseminate their findings.

Our studies will 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 Patron

Dear All,

Dear Esteemed Readers,

It is with great pleasure and enthusiasm that I extend my warmest greetings to each of you as we embark on another insightful journey through the pages of the KIET Research Magazine.

As the Additional Director, I am continually inspired by the dedication and innovation showcased within the vibrant research community at our institution. The pursuit of knowledge, coupled with the relentless quest for excellence, forms the cornerstone of our endeavours.

In this edition, you will find a diverse array of articles, each offering a unique perspective and contributing to the advancement of knowledge in various fields. From groundbreaking discoveries to thought-provoking analyses, our researchers continue to push the boundaries of what is possible, driving positive change and making meaningful contributions to society.

Dr. Shailesh Tiwari

Additional 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 immense 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 make 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
Office of Dean (R&D)
Department of Electronics & Communication Engineering
KIET Group of Institutions, Delhi-NCR, Ghaziabad, Uttar Pradesh, India-201206
e-mail: dean_rnd_office@kiet.edu, Contact No. +919718907912 (O)

Glimpses of Month

Translational Research and Entrepreneurship Knowledge Session with Focus on BIRAC-BIG Funding Proposal

The Dean R&D office has organized an interaction session on Translational Research and Entrepreneurship Knowledge Session with a Focus on the BIRAC-BIG Funding Proposal The event is Organized by the **Foundation for Innovation And Technology Transfer (FITT), IIT Delhi, and KIET Group of Institutions**, Delhi-NCR, Ghaziabad scheduled on 24th Jan'24 at 2.00 PM.

Session Objective: To foster innovative ideas in key sectors: Pharma, Medical devices, Healthcare, Diagnostics, Industrial Biotech, Agriculture, Environment

Main Focus: Biotechnology, Ignition Grant (BIG) by BIRAC:

Provides financial assistance of INR 50 Lakhs to startups and individual entrepreneurs.

Supports the development of innovative ideas with commercial potential.

The duration of support is up to 18 months.

Aims at validating proof of concept, encouraging enterprise formation, and bringing technology to market.

Collaborative Benefits through BIG:

Assistance at the ideation stage.

Technical and business mentorship.

Support for intellectual property inquiries.

Regulatory guidance.

Customer discovery activities.

Access to IIT Delhi incubation facility for R&D needs.

Republic Day Invitation: Based on Contribution to IPR by KIET

The government of India commemorated 75 years of our Republic Day on 26 Jan 2024. As per the tradition, the Republic Day parade was held at Kartavya Path, New Delhi in the presence of esteemed national and international dignitaries.

KIET Institute has also been shortlisted to attend the Republic Day parade as a guest of the government based on your contribution to the field of IPR.

On this occasion, KIET has nominated Dr. Vibhav Kumar Sachan, Dean of R&D to attend the prestigious ceremony.

Entrepreneurship: Ideas to Product

The Department of Electrical and Electronics Engineering had the privilege of hosting Mr. Rishikesh Ghare, Founder and CEO of Indio Networks Pvt. Ltd, on 16th January 2024. He delivered an insightful lecture on the topic "Entrepreneurship: Ideas to Product." Students of EEE were enriched by his wisdom and gained valuable insights into the world of entrepreneurship.

Atal FDP on "Deep Learning for Visual Computing"

The Atal Faculty Development Program on "Deep Learning for Visual Computing", organized by the Department of Computer Science & Engineering had a spectacular and successful inauguration on 8 January 2024, marking the beginning of an incredible journey into the world of innovation and technology.

The presence of our esteemed Chief Guest, Dr. R K Khandal, Former Vice-Chancellor of AKTU, added immense value to the event, making it an unforgettable start.

The enthusiasm and energy from all participants, faculty members, and dignitaries have set the stage for six days of intensive learning, collaboration, and hands-on experiences.

Statistics of KIET Research and Development Activities
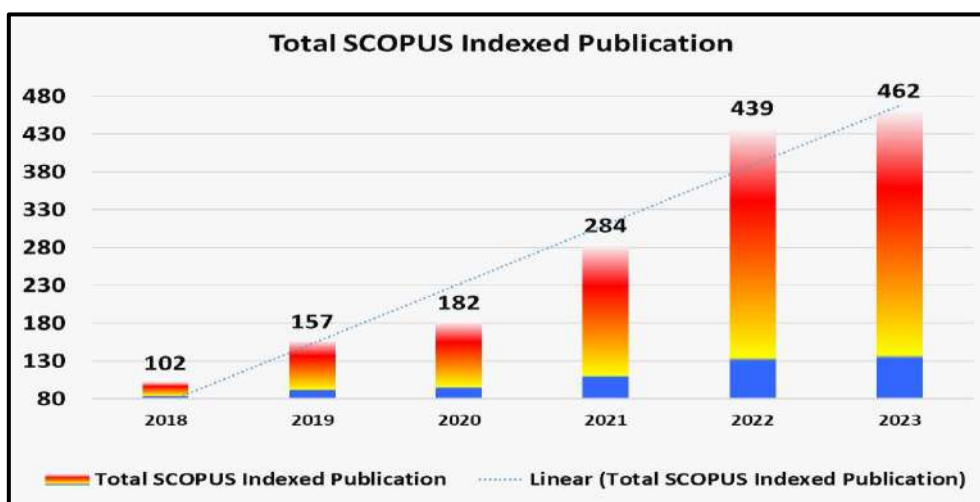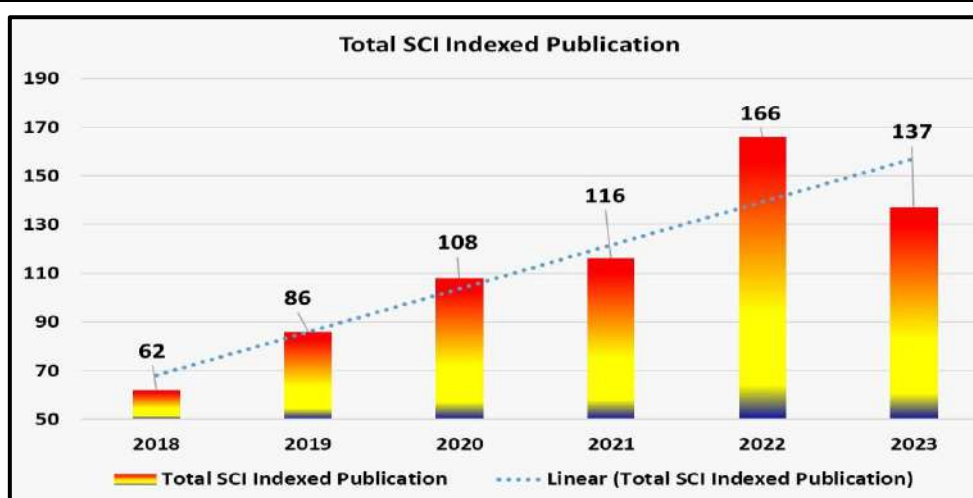
Rankings & Accreditations

- ➢ 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 Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India. (Till 31 Mar 2025)

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(EPABX) : 26565694, 26562133
: 26565687, 26562144
: 26562134, 26562122
फेक्स/FAX : 26960829, 26529745
Website : http://www.dsir.gov.in

सूचना का अधिकार
RIGHT TO INFORMATION

(आईएसओ 9001:2008 प्रमाणित विभाग)
(AN ISO 9001:2008 CERTIFIED DEPARTMENT)

भारत सरकार
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वैज्ञानिक और औद्योगिक अनुसंधान विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग,
नई दिल्ली - 110016
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
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 SCI Research Publications and 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 December 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	137	465	602
2024	4 (upto Jan)	9 (upto Jan)	13
Total	679	1638	2317

Category	Number of Publication for November 2023	Number of Publication for December 2023
SCOPUS Publications	46	140
Web of Science Publication	13	12

Details of Patents Published/Granted

Title of the Invention: A System and Method for Authenticating the Medicines Using IOT

Application Number: 202311077810 A (Indian Patent Office)

Applicant(S): KIET GROUP OF INSTITUTIONS (CS)

Date of Filing: 16-11-2023

Date of Publishing: 05-01-2024

Field of the Invention: The present invention relates to a system and method that is based on unique code to check the authenticity of medicines, the database of the medicinal database, and manufacturer details, using software applications and IOT support.

Objects of the Invention: It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative.

An object of the present disclosure is to provide a system and method for authenticating medicines using IoT.

An object of the present disclosure is to overcome one or more drawbacks associated with conventional mechanisms of medicine supply.

An object of the present invention is to authenticate the medicines which are purchased by the users.

An object of the present invention is to reduce the cases of bad health due to unauthenticated medicines.

An object of the present disclosure is to make the system more transparent, and users can get exposure to explore the details of the product that they are using.

The Unique ID-based software system is accessible through any computing device like a laptop, a computer, a smartwatch, a cellular phone, a smartphone, or a combination thereof; and the data is fetched through the IOT system based on the input ID.

Summary of the Invention: The following presents a simplified summary of the invention to provide a basic understanding of some aspects of the invention.

This summary is not an extensive overview of the present invention. It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as a prelude to a more detailed description of the invention presented later.

The invention aims to provide a System and Method for Authenticating Medicines utilizing Internet of Things (IoT) technology. It addresses the global concern of counterfeit medicines by combining unique identifiers, IoT-enabled packaging, and a centralized authentication platform. Each pharmaceutical product receives a unique identifier during manufacturing, embedded in an IoT-enabled package that monitors environmental conditions and detects tampering. The centralized platform facilitates real-time authentication for manufacturers, distributors, and end-users, ensuring the legitimacy of medicines throughout the supply chain. This innovative system enhances patient safety, provides continuous monitoring, and establishes comprehensive traceability from production to consumption.
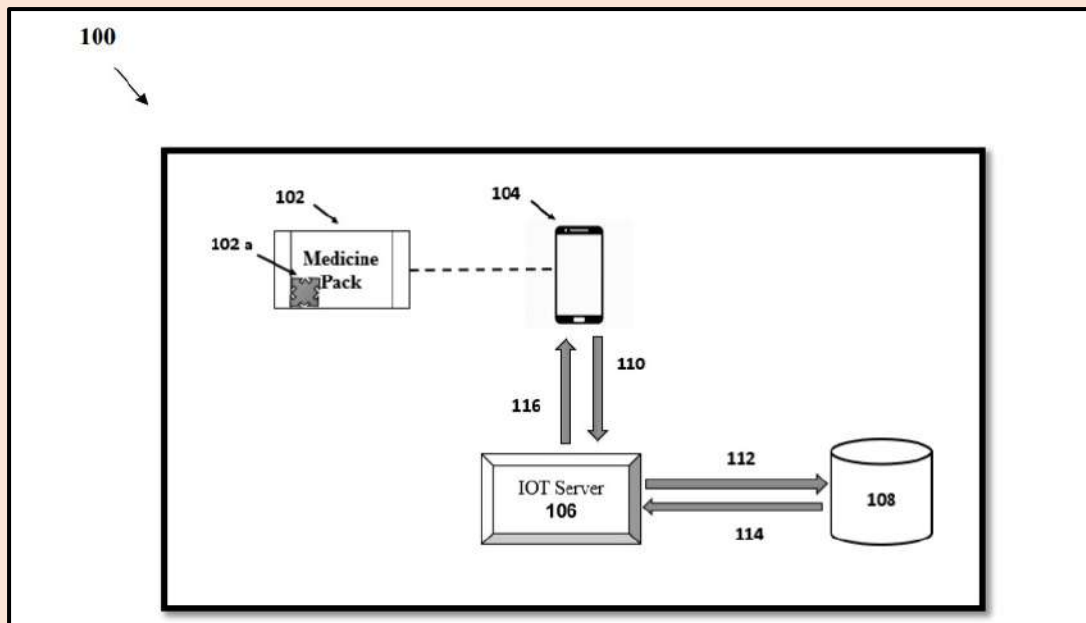
Figure 1: Illustrates an exemplary architecture of a system of an embodiment of the present disclosure.
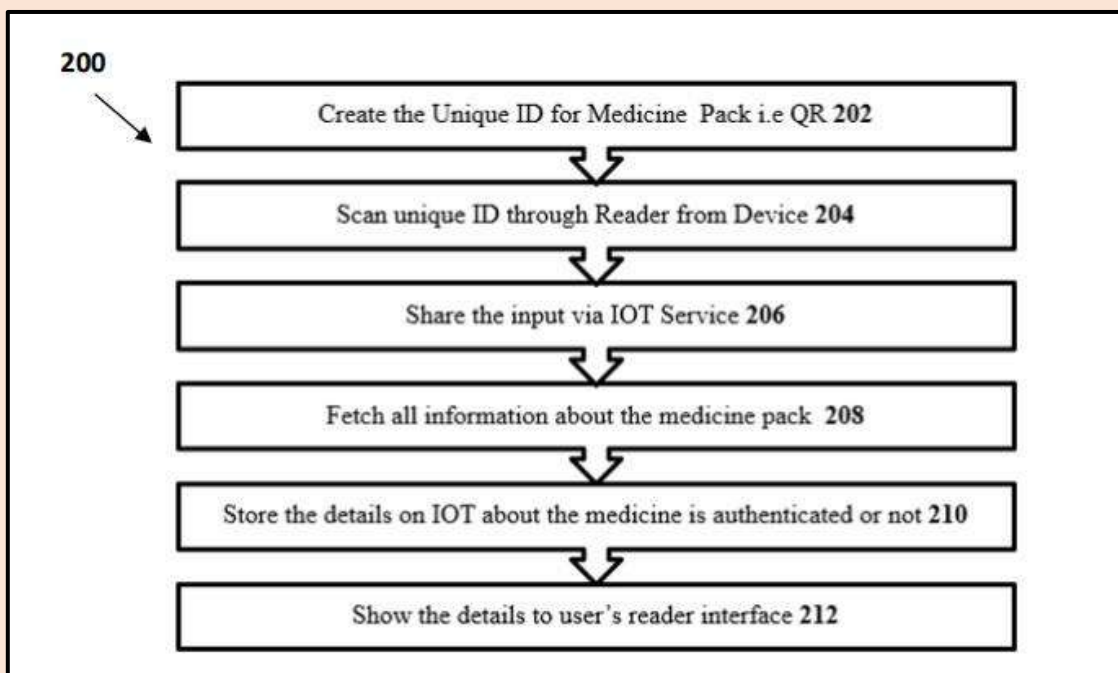
Figure 2: Illustrates an exemplary representation showing the detailed flow of method, by embodiments of the present disclosure.

Title of the Invention: Capacitor-Based Energy-Efficient Starter for High-Rating motors

Application Number: 202311077815 A (Indian Patent Office)

Applicant(S): KIET GROUP OF INSTITUTIONS (EEE)

Date of Filing: 16-11-2023

Date of Publishing: 05-01-2024

Field of The Invention: The embodiments of the present disclosure relate to Capacitor-Based Energy energy-efficient starters, particularly to a starter that can start high-rating electric motors with very low energy-consuming starters.

The present invention is designed to address key objectives and challenges in the field of motor control and energy efficiency. The primary objects of the invention are as follows: Enhancing High-Rating Motor Starting Efficiency: The major goal of the innovation is to offer a starter mechanism that is extremely effective for high-rating motors. To dramatically minimize power consumption and stress during motor start-up and consequently increase overall energy economy, this starter makes use of cutting-edge capacitor-based technology. Minimizing Voltage Drops: The purpose of the innovation is to prevent voltage dips and power fluctuations that frequently happen during motor startup and can result in decreased motor performance and increased equipment wear. This innovation maintains steady voltage levels during startup, guaranteeing smooth motor performance, by utilizing an original capacitor-based method.

Summary: The following presents a simplified summary of the invention to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the present invention.

It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as a prelude to a more detailed description of the invention presented later. Energy losses in conventional motor starters are addressed by the current invention, which offers a creative and effective alternative. Due to the electromagnetic coil's constant energization during the motor's operation, conventional motor starters waste a large amount of energy. This causes I^2RT losses, decreased energy efficiency, and unwanted heating, all of which can shorten the starter's operating lifespan. Due to these restrictions, our invention presents a special technique that maximizes energy use while maintaining the fundamental functioning of motor starters. In several different industries, conventional motor starters—including three-point and four-point starters—and even AC/DC drives—have been widely used.

However, these systems continue to provide power to the electromagnetic

coil, which results in ongoing I^2RT losses, particularly during prolonged motor running.
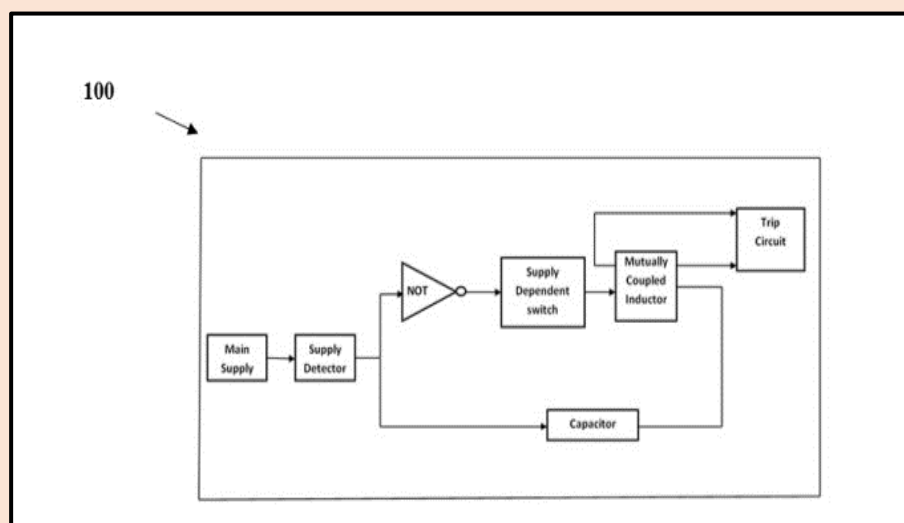
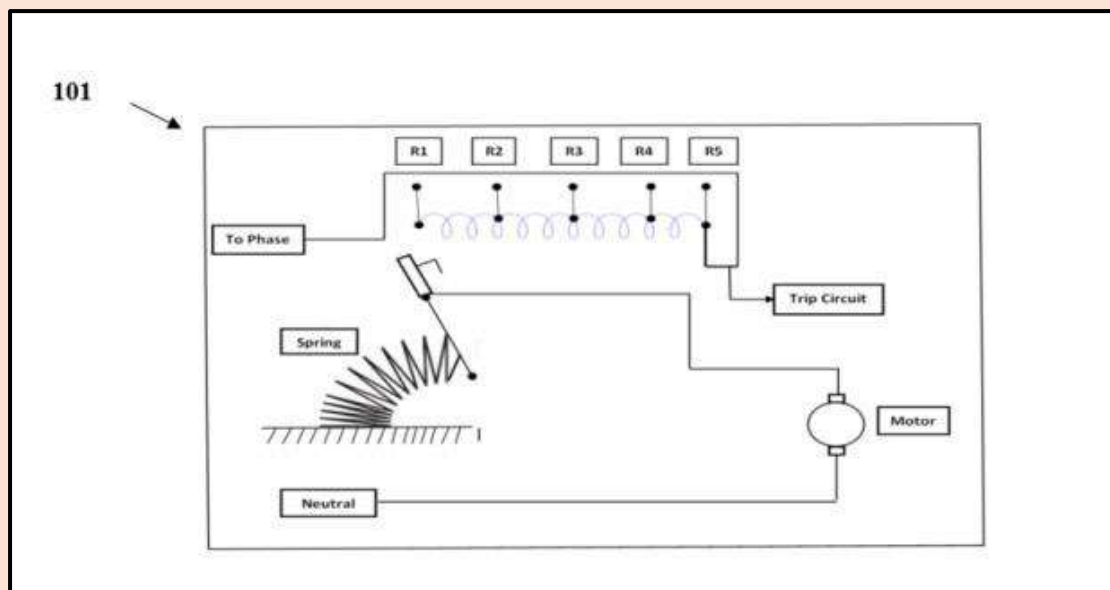**Figure 1:** Includes a supply detector, a capacitor, a mutually coupled inductor, and a trip circuit.

Figure 2: Show the main part of the Starter.

Title of the Invention: Innovative Method and System for Deceptive Content Analysis Using Deep Learning

Application Number: 202311077811 A (Indian Patent Office)

Applicant(S): KIET GROUP OF INSTITUTIONS (CSIT)

Date Of Filing: 16-11-2023

Date Of Publishing: 05-01-2024

Field of the Invention: The field of Social Cause of News Analysis and Predicts its truthiness. The answers provided by the current innovation apply to the field of Quality and truth assurance of the News. The current invention involves the Assessment of a different kind of News run on social media platforms. The present invention is more specifically linked to Innovation in the Assessment Process of the Different kinds of News and provides true news related to it.

OBJECTIVE OF THE INVENTION: Some of the objects of the present disclosure, which at least one embodiment herein satisfies, are as follows. It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative.

An object of the present disclosure is to provide the purposeful dissemination of incorrect or misleading information through traditional and social media to gain political or financial power is an example of fake news. Fake news has the potential to have a substantial impact, one that may be detrimental to both individuals and organizations while also weakening faith in reliable news sources.

It is essential to be able to identify fake news to foster a well-informed society and to defend against the potentially negative repercussions. The automatic detection of fake news is

currently being assisted by the development of various tools, such as machine learning and natural language processing. It is essential to be able to identify instances of fake news to sustain an atmosphere in the media that is honest and accountable.

Summary of the Invention:

The following presents a simplified summary of the invention to provide a basic understanding of some aspects of the invention.

This summary is not an extensive overview of the present invention. It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as a prelude to a more detailed description of the invention presented later.

The modern era of digital technology has seen a broad transmission of incorrect information on the internet, which offers a considerable risk to individuals, companies, and society as a whole as a whole. The rapid distribution of false content, such as fake news, altered media, and fraudulent advertisements, can have substantial repercussions, such as the spread of misinformation, the operation of fraudulent financial schemes, and the instigation of social unrest.

The detection and prevention of fraudulent content provide a substantial and pressing challenge that calls for the application of very sophisticated technical interventions. The detection and mitigation of false information is a crucial topic of research for which there are numerous methodologies and techniques already in use. Image and video forensics, deep learning for deep fakes, NLP methods for language models, and user behaviour analysis. All methods are applied to various dataset types. For all types of datasets, there is no commercial software to discover fraudulent content analysis.

Figure 1: Illustrates metrics indicating the model's degree of accuracy, in accordance with an embodiment.

Title of the Invention: System for Vehicle Controlling in Foggy Days

Application Number: 202311077814 A (Indian Patent Office)

Applicant(S): KIET GROUP OF INSTITUTIONS (CS)
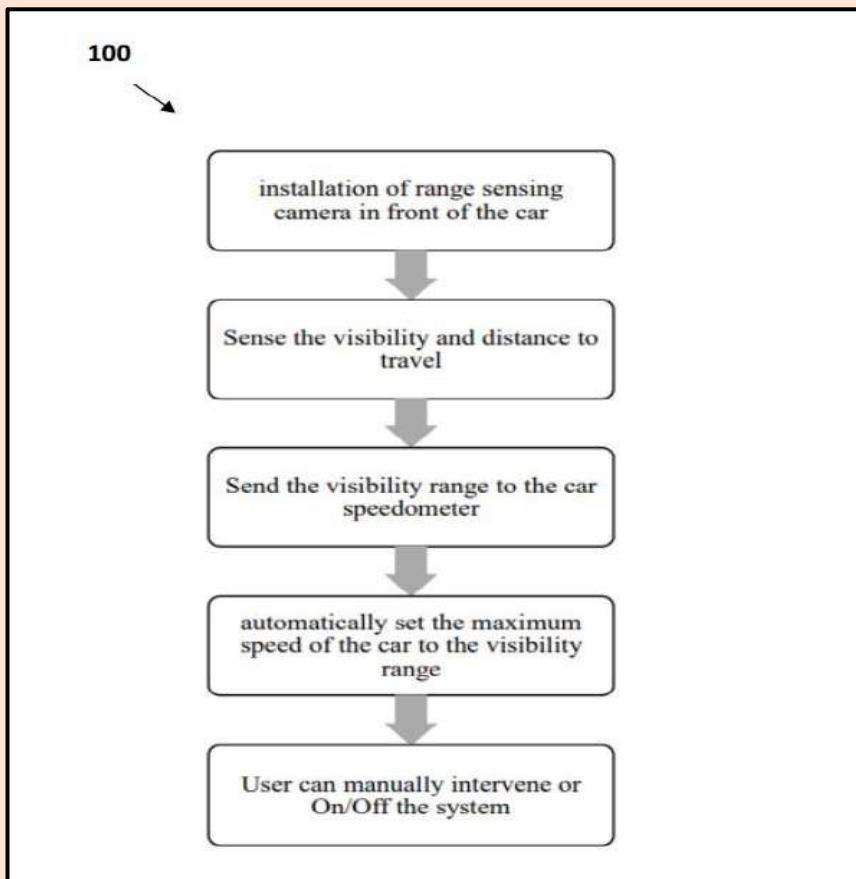
Date of Filing: 16-11-2023

Date of Publishing: 05-01-2024

Field of the Invention: The present invention relates to the field of Mechanical Engineering and electronics engineering where the light illumination sensor is used.

Objects of the Invention: Some of the objects of the present disclosure, which at least one embodiment herein satisfies, are as follows. It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative. The present invention relates to automatic controlling device in the vehicles based on the fog on roads. The objective is to detect the range of visibility in the fog environment and automatically balance the speed of vehicle. The system deploys the visibility sensor which is mapped with the vehicle speedometer.

Summary: The following presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the present invention. It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as a prelude to a more detailed description of the invention presented later. The invention integrates GPS-enabled ambulance tracking devices and an algorithmic resource allocation engine to swiftly identify the nearest available ambulance to an emergency location, ensuring quick response times and an efficient allocation of resources. By seamlessly interfacing with emergency call centers, the invention extracts critical information from incoming calls, relaying it to dispatchers and ambulance crews via a communication platform. This real-time information

100

- installation of range sensing camera in front of the car
- Sense the visibility and distance to travel
- Send the visibility range to the car speedometer
- automatically set the maximum speed of the car to the visibility range
- User can manually intervene or On/Off the system

exchange enhances decision-making and response effectiveness. Through intelligent routing, automated resource allocation, and real-time communication, the invention optimizes ambulance dispatch processes, leading to reduced response times, improved patient   ambulance dispatch processes, leading to reduced response times, improved patient outcomes, and more effective utilization of emergency medical services.

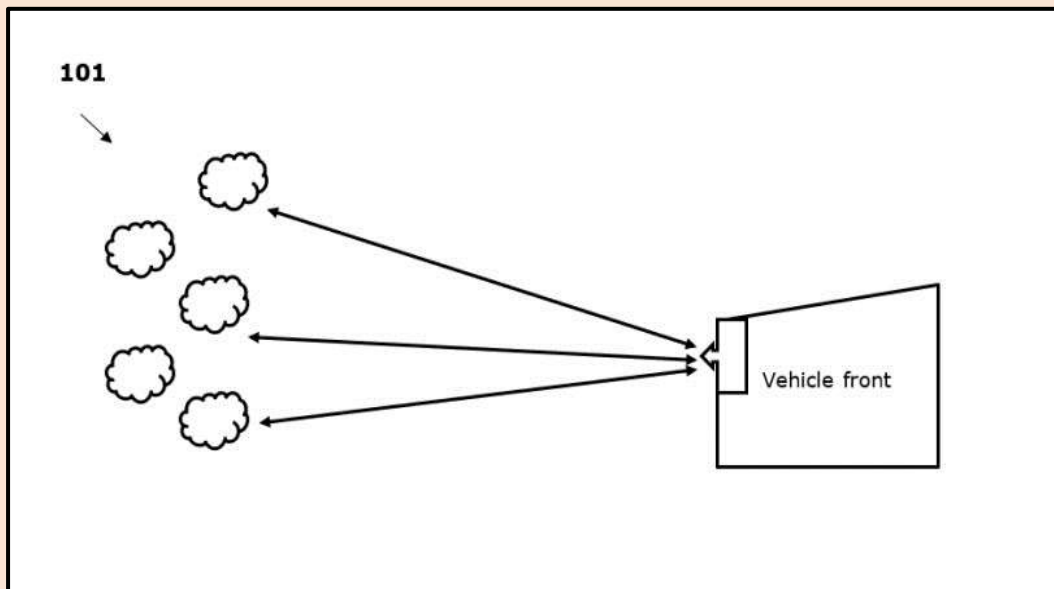**Figure 1**: Illustrates workflow chart of the present Enclosure.

Figure 2: Illustrates an exemplary architecture of the system

Title of the Invention: A Solar Powered Portable Medicine Carrier "Solco"

Application Number: 202311077812 A (Indian Patent Office)

Applicant(S): KIET GROUP OF INSTITUTIONS (EEE)

Date of Filing: 16-11-2023

Date of Publishing: 05-01-2024

Field of the Invention: The present invention relates to the field of Mechanical and electrical engineering.

Objects of the Invention: Some of the objects of the present disclosure, which at least one embodiment herein satisfies, are as follows.

It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative.

An object of the present disclosure is to provide a solar-powered portable medicine carrier "solco". These would be the primary components of the invention, likely mounted on the exterior of the carrier. Solar panels would capture sunlight and convert it into electrical energy to power various functions of the medicine carrier. Inside the carrier, there could be a temperature control system to maintain the proper conditions for storing medications and medical supplies. This might include a cooling or heating mechanism, which can be powered by solar panels.

A built-in rechargeable battery or energy storage system would store excess solar-generated power. This stored energy could be used to power medical devices, charge electronic devices, or run the temperature control system during nighttime or cloudy conditions.

SUMMARY OF THE INVENTION: The following presents a simplified summary of the invention to provide a basic understanding of some aspects of the invention.

This summary is not an extensive overview of the present invention. It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as a prelude to a more detailed description of the invention presented later.

The present invention provides a solar-powered portable medicine carrier designed to address the challenges of storing and transporting medical supplies in areas with limited access to conventional power sources.

Key features include high-efficiency solar panels for continuous power generation, a rechargeable battery system for energy storage, a temperature-controlled compartment for sensitive medications, LED indicator lights for real-time monitoring, and a durable, portable design.

SOLCO has the potential to revolutionize healthcare logistics in remote and disaster-stricken areas, providing a reliable and energy-efficient solution for medical professionals and aid workers. The invention aims to provide a "Solar Powered Portable Medicine Carrier" a hypothetical invention designed to revolutionize medical storage and transport. It integrates solar panels to harness renewable energy from the sun, making it self-sustaining and ideal for use in remote areas with limited access to electricity.
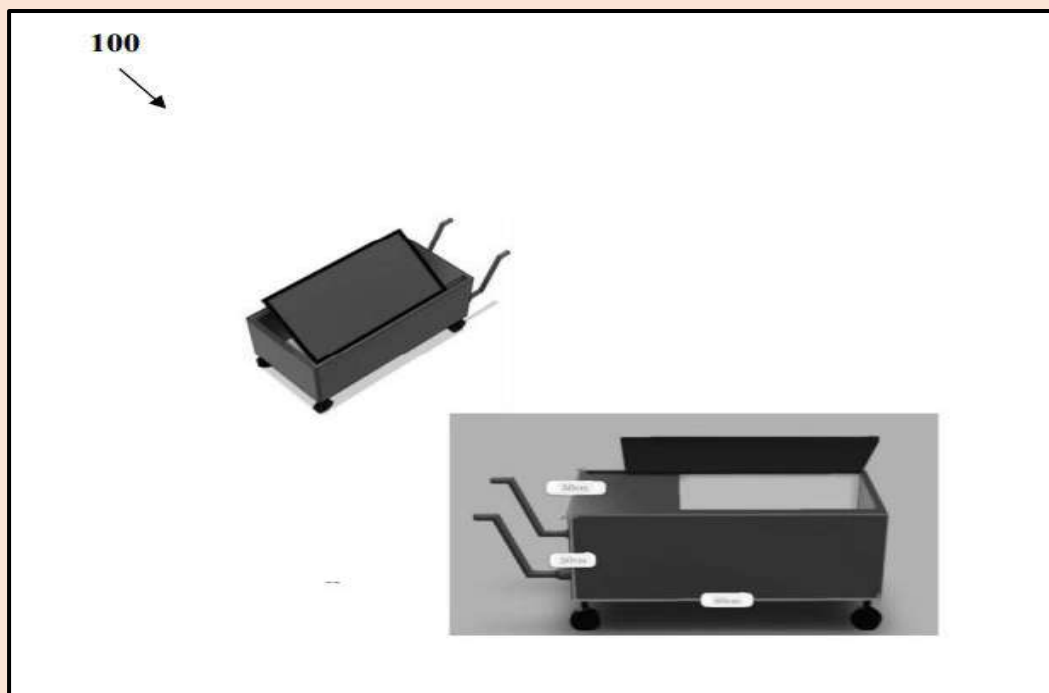

Figure 1: Illustrates an exemplary process of the solar powered portable medicine carrier "solco", in accordance of an embodiment

PATENTS Published – January 2024

S. No.	Title Of Patent	Dept.	Name Of Applicant	Date Of Publication	Status
1.	An Intelligent Data Preprocessing System for Enhanced Machine Learning Model Performance	IT	Mr. Shashank Yadav, Mr. Shashank Yadav, Ms. Nidhi Goyal, Mr. Deepak Vishwakarma, Mr. Mayank Tyagi, Mr. Analp Pathak	12-01-2024	Published
2.	Dynamic Emergency Response System: Machine Learning-Enabled Ambulance Routing and Navigation	CS	Akanksha, Kashish Gupta, Khushi Vaish, Nikita Sharma, Dr. Seema Maitrey, Shalini Kapoor, Dr. Vikas Kamra	12-01-2024	Published
3.	An Ai and IOT-Based System to Maximise Efficiency in The Healthcare Sector	KSOP, CSE	Mr. Sanjeev Kumar Chauhan, Swati Sharma	12-01-2024	Published
4.	Machine Learning-Based System to Detect Deep Fake Videos on Social Media	KSOM	Tanushree Sanwal	12-01-2024	Published
5.	Integrated System and Framework for A Sustainable Transient Megapolis: Harnessing Riverine Ecology In The Context Of Ephemeral Urbanism	CS	Mr Rishabh, Mr Puneet Kumar Goyal, Mr. Anmol Jain	19-01-2024	Published
6.	A Systematic Method For Digital And Social Media Metrics On Mental Health Approaches For Youth	CSIT	Ambrish Gangal	12-01-2024	Published
7.	Minitome	KSOP	Dr. Abhishek Kumar	12-01-2024	Registration of Design
8.	Automated Diagnosis of Respiratory Diseases From Medical Imaging Using Deep Learning	MCA	Mr. Praveen Kumar, Dr. Shashank Bhardwaj	26-01-2024	Registration of Design

9.	IOT Based Solar Power Agriculture Robot	CSIT	Dr. Deepak Kumar Singh	19-01-2024	Registration of Design
10.	Apparatus For Synthesis of Pharmaceutical Nanosuspension	KSOP	Dr. N. G. Raghavendra Rao, Ayush Asthana, Anshika Malik, Shagun Nehra	12-01-2024	Registration of Design
11.	System And Method for Optimizing Resource Allocation Strategies For 5g Network Using M 1	CS	Apoorva Singh, Ayush Siloiya, Aayushi Saini, Neha Shukla, Harsh Khatter	05-01-2024	Published
12.	A System And Method For Authenticating The Medicines Using Iot	CS/KSOP	KIET , Harsh Khatter, Anjali Jain, Richa Goel, Ajay Kumar Shrivastava	05-01-2024	Published
13.	Capacitor-Based Energy-Efficient Starter For High-Rating motors	EEE	KIET , Ameer Faisal, Dr Neeraj Kumar Gupta, Dr Mohammad Shariz Ansari, Masood Rizvi, Dr Jyoti Srivastava	05-01-2024	Published
14.	Innovative Method and System for Deceptive Content Analysis Using Deep Learning	CSIT	KIET, Deep Kumar, Hritik Gupta, Divyam Pal, Palak Sharma	05-01-2024	Published
15.	System For Vehicle Controlling in Foggy Days	CS/KSOP	KIET, Mr. Harsh Khatter, Ms. Anjali Jain, Ms. Richa Goel	05-01-2024	Published
16.	A Solar Powered Portable Medicine Carrier "Solco"	EEE	KIET, Brijesh Singh, Shashwat Dwivedi, Akash Tripathi	05-01-2024	Published
17.	A Centralized System and Method for Path Planning of Robots	ECE	KIET, Dr. Neelesh Ranjan Srivastava, Satya Prakash Singh, Dr Vibahv Kr Sachan, Ankur Omer, Priyansh, Ankit, Amit, Salvi, Ujjwal, Yash, Ritvi	10-01-2024	Granted
18.	Novel Peptidomimetics Lead as Potent Hepatoprotective Agent	KSOP	Dr. K. Nagarajan, Dr. Parul Grover, Dr. Roma Ghai, Ms. Garima Varshney	25-01-2024	Granted

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.	Arun Kumar Tripathi	Prof & HoD	MCA	"Secure and Efficient Multicast-Enabled Handover Scheme Pertaining to Vehicular Ad Hoc Networks in PMIPv6"	2.7	11000	SCIE
2.	Anjan Kumar	Assistant Professor	KSOM	"Impact of online advertising on consumer buying behaviour with special reference to electronics industry in Delhi - NCR"	-	2,000	ESCI
3.	Amit Kumar Arora	Associate Professor	KSOM	" A Study of Preference of Individual Investor towards investment in stocks"	-	2,000	ESCI
4.	Gaurav Sharma	Assistant Professor	ME	" A Novel pathway for joining power plant dissimilar steels by diffusion bonding in as - machined surface conditon."	3.9	5,000	SCOPUS
5.	Varun Gupta	Associate Professor	EN	"A design of bat-based optimized deep learning model for EEG signal analysis"	3.6	11,000	SCIE & SPRINGER
6.	Balram Tamarkar	Assistant Professor	ECE	"Performance optimization of conventional ROF link by considering the effect of RF source linewidth and photonic source linewidth for the next-generation networks"	-	2,000	SPRINGER
7.	Balram Tamarkar	Assistant Professor	ECE	" Comparative Analysis Between Different Optical Modulators of Analog and Digital Radio Over Fiber (RoF) Link of the next-Generation Networks"	-	2,000	SPRINGER
8.	Manish Bhardwaj	Associate Professor	CSIT	" A Novel Architecture for the Smart		5,000	SCOPUS

				Pedestrian Crossing in Cities Using IoT-Based Approach."		
9.	Manish Bhardwaj	Associate Professor	CSIT	"Analysis of Neural Network and Neuromorphic Computing with hardware — A survey"		2,000	SCOPUS

Highlights of the Published Journal Articles

1.   Amit Kumar Goyal, Gaurav Agarwal, Arun Kumar Tripathi, and Mangal Sain, "Secure and Efficient Multicast-Enabled Handover Scheme About Vehicular Ad Hoc Networks in PMIPv6", *Appl. Sci.* **2023,** *13***(4), 2624; https://doi.org/10.3390/app13042624**

In VANET, mobility management and handover management are two of the most intriguing and challenging research topics. The existing mobility management infrastructures are unable to provide seamless secure mobility and handover management. It is very common in a vehicular network that when a vehicle roams between two domains, its reachability status may be compromised. The main reason for this is the higher handover latency and packet loss during the handover process. In the last decade, IP-based mobility protocols have been proposed for interoperable handover management systems. There has been a great deal of interest in providing IP multicast to mobile nodes such as vehicles, and numerous strategies have been put forth thus far. This research article proposes an IP multicast-enabled handover architecture for VANET in PMIPv6. Adding the IP multicast facility to the authentication server allows handover management that is both intra-domain and inter-domain, which originally was not supported by PMIPv6. This makes it possible for the IP service of a vehicle to maintain a connection from any location, without changing the earlier application. Additionally, a secure architecture with authentication capabilities built on top of PMIPv6 is suggested for VANET to address the authentication problem. Finally, the article compares the performance of the proposed architecture with that of the ones currently in use by
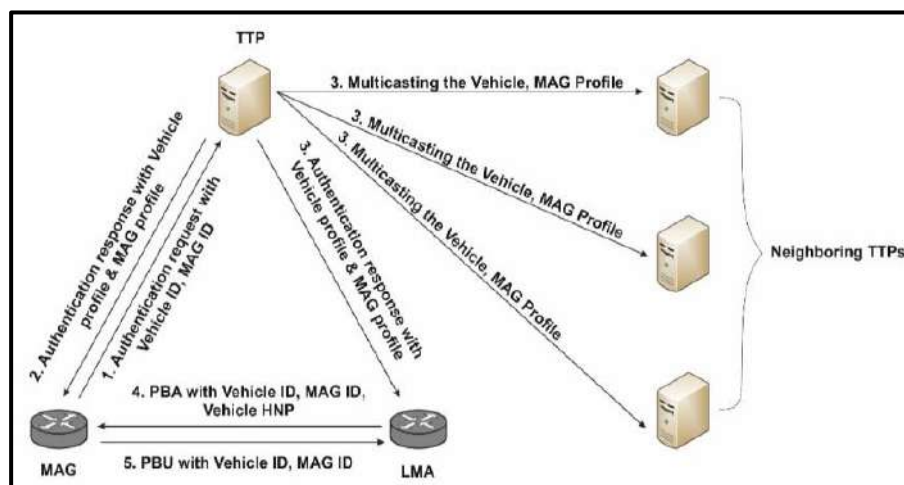
varying several factors, including the vehicle's density, the setup costs required, and the unit transmission costs on wired and wireless links, and it shows that our proposed solution ensures the handover process with a minimal cost change.

2.   Kumar, Anjan, Gupta, Karuna, Arora, Amit Kumar, Tyagi, Rashmi, Chaudhary, Sarthak & Agarwal, Samarth(2023) Impact of online advertising on consumer buying behavior with special reference to the electronics industry in Delhi-NCR, *Journal of Statistics and Management Systems,* **26:4, 955–964, DOI: 10.47974/JSMS-1065**

Concerning the electronics industry in Delhi-NCR, this study investigates the effects of online advertising on consumer buying behaviour. Every electronic brand in India is quite aggressive in influencing consumer buying behaviour through online advertising of their goods and services. Companies are beginning to understand the value of producing more effective

advertisements because of the growth in technology and digital transformation, which has become crucial for them to have a competitive advantage. 168 respondents of all ages who use various electronic items participated in this study. According to the survey, customers' purchasing decisions in the electronic industry are highly influenced by video advertisements and banner advertisements that include comprehensive product and price information. In the electronic industry, companies with strong brand images, service, and durability significantly impacted consumers' buying decisions.

3. Arora, Amit Kumar, Gupta, Vijay Prakash, Sharma, Tanisha, Husain, Suhaib, Sharma, Swarnima, Kumar, Sunil & Kumar, Sumit(2023) A study of preference of individual investor towards investment in stocks, *Journal of Statistics and Management Systems* , 26:4, 945–954, DOI: 10.47974/JSMS-1053

Individual behaviour in terms of investment is influenced by various factors that might change the decision-making of the individual. The study is conducted to determine the perception and investors' behaviour regarding investment in stocks, factors considered while investing in stocks and to determine the reason for not investing in stocks. This research paper is a result of primary data that is collected by 330 respondents. The study found the background of the company, expected return, FII interest, statistics of daily stock activities, and promoter shareholding as the important factors behind making investment decisions in the stock. The study also found the reasons for not investing in stocks are risk involved, lack of awareness and they have other preferences for the investment. The study found gender, age, and occupation as the significant factors and annual income and education as the non-significant factors while making investment decisions.

4. Gaurav Sharma, Dheerendra Kumar Dwivedi, A novel pathway for joining power plant dissimilar steels by diffusion bonding in as-machined surface condition, Manufacturing Letters, Volume 38, 2023, Pages 69-73, ISSN 2213-8463, https://doi.org/10.1016/j.mfglet.2023.09.010.

Surface preparation, which includes polishing and cleaning, has become a crucial stage in diffusion bonding for creating excellent quality durable joints. Polishing is a time-consuming and labor-intensive task that reduces process productivity. To increase process productivity, the joints must be established under as-machined surface conditions. Pressure impulses were used to conduct diffusion bonding of P92 steel and 316L austenitic stainless steel under as-machined surface conditions. At 1000 °C, 30 min bonding time, and 20 MPa Maximum impulse pressure, tensile strength, and elongation of the joint were found to be 628.5 MPa and 38.6 % respectively.

5. Gupta, V., Kanungo, A., Kumar, P. *et al.* A design of bat-based optimized deep learning model for EEG signal analysis. *Multimed Tools Appl* 82, 45367–45387 (2023). https://doi.org/10.1007/s11042-023-15462-2

Depression is a mental illness that negatively affects a person's thinking, actions, and feelings. Thus, the rate of depression is identified by analyzing Electroencephalogram (EEG) signals. Because of noise, the problem of classifying depression rate has some issues, such as low accuracy and required high training time. In this research work, a novel Bat-based U-NET Signal Analysis (BUSA) architecture is developed to estimate the patient's depression rate with an EEG dataset. This technique involves pre-processing, feature selection, feature extraction, and classification. After the data training, the pre-processing

function was activated to neglect the noise in the brain signal. Hereafter, the noiseless Signal is used for the further process. Here, the bat algorithm mimics the behaviour of the bat's frequency and loudness, increasing the accuracy of prediction and classification. This fitness
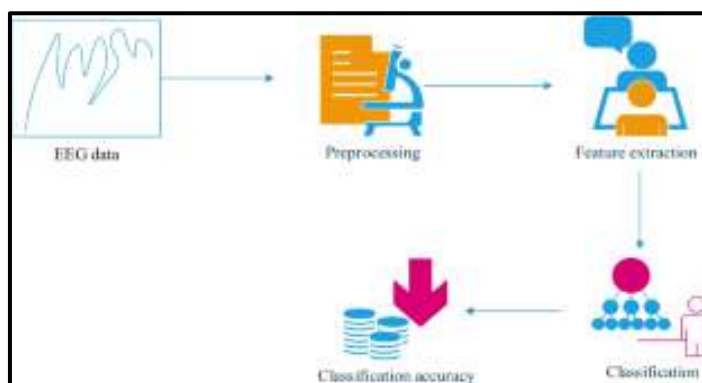
function is upgraded in the U-NET classification phase. Moreover, the brain signal's feature selection and depression rate were classified using the bat fitness that has helped to gain the desired output. Finally, the performance metrics of the proposed BUSA technique are compared with other existing methods regarding the accuracy, AUC, precision, recall, and power. The proposed BUSA framework attained a high accuracy rate of about 99.64%, a maximum precision level of approximately 99.98%, a high recall rate of approximately 99.95%, and a high AUC of approximately 99.2%. The developed framework has attained better results in classifying depression rates.

6. **Tamrakar, B., Singh, K., Kumar, P.** *et al.* **Performance optimization of conventional RoF link by considering the effect of RF source linewidth and photonic source linewidth for the next-generation networks.** *J Opt* **52, 2096–2108 (2023). https://doi.org/10.1007/s12596-023-01158-**

The proposed research article demonstrates the mathematical and simulative analysis of Mach–Zehnder modulator (MZM)-based radio over fiber (RoF) link. This link consists of an applied RF signal at 10 GHz with a photonic carrier frequency of 193.414 THz. The performance of the proposed link is demonstrated in two categories. Firstly, the SNR penalty has been investigated for the used conventional RoF link using the combined effect of RF source linewidth and carrier source linewidth. Once we are observing the SNR penalty as a function of the RF source linewidth in association with the carrier source linewidth, approximately 20 dB SNR penalty has been found for each optical carrier linewidth 15, 125, and 512 MHz, over the 5, 15, 20, and 30 km optical fiber impairments. Also, we have observed that the SNR penalty is a function of the carrier source linewidth in association with the optical fiber impairments. Simulative outcomes show that approximately 0.21, 1.9, and 7.4 dB, SNR penalty occurs for, 1.0, 8.0, and 24.0 km fiber length, respectively, while approximately 1.0, 4.9, and 11.2 dB, SNR penalty occurs for, 5.0, 15.0, and 27.0 km fiber length, respectively. It shows that the lowest SNR penalties have been demanded while opting for carrier source linewidth rather than RF source linewidth. In the second way, the Q-factor has been analyzed for the proposed link. The measured Q-factor is 73.65, 20.42, 14.82, 7.11, and 1.77 for optical fiber impairment's 2, 2.5, 3, 3.5, and 5 km, respectively, using RZ scheme, while the measured Q-factor is 27.26 for 5 km fiber impairment using NRZ scheme. Simulative outcomes show that the

proposed RoF link using the RZ scheme is providing enhanced Q-factor with better eye opening in the desired electricaspectrum.
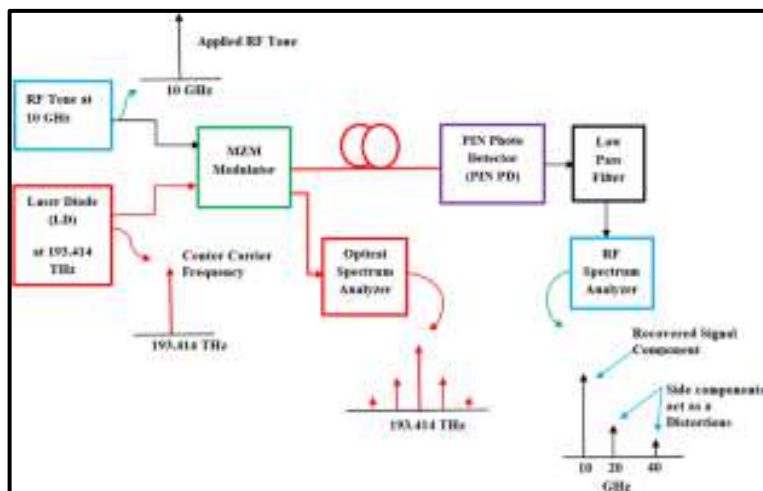
7. **Tamrakar, B., Singh, K. & Kumar, P. A comparative analysis between different optical modulators of analog and digital radio over fiber (RoF) link for the next-generation networks.** *J Opt* **52, 1628–1638 (2023). https://doi.org/10.1007/s12596-022-00994-x**

This paper highlights the analytical and simulative approach of Linearized Radio over Fiber (RoF) Link. In the proposed research article, we perform the comparison between mostly utilized optical modulators such as Mach–Zehnder modulator (MZM), dual-drive Mach–Zehnder modulator (DD-MZM), linear electrical absorption modulator (EAM) and phase modulator (PM)-based RoF link. These optical modulators are designed based on the analog photonic RoF link method. Optical simulator (OptSim), which is versatile
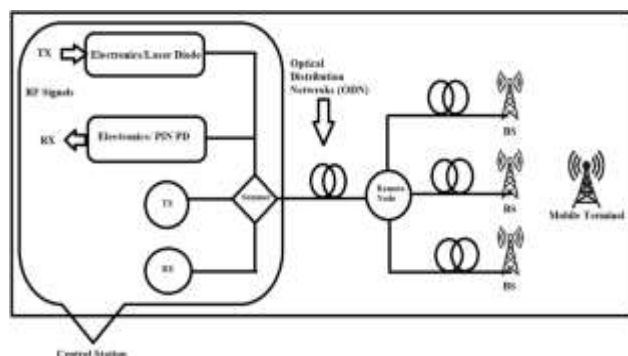
commercial simulation software, is used to confirm and validate the proposed results. In the proposed model, we compared the fundamental to distortion component ratio (FDCR) of measured and evaluated electrical spectrums for all used optical modulators based on RoF link. The measured FDCR for used optical modulators such as MZM, DD-MZM, Linear EAM, and PM is found as 36.41 dB, 43.50 dB, 13.0 dB, and 21.9 dB, respectively. DD-MZM-based RoF link exhibits the highest FDCR with a measured value of 43.50 dB, then all used optical modulators. It shows that the DD-MZM-based RoF link exhibits higher Linearization compared with others used optical modulators-based RoF links. We also proposed a comparative analysis between MZM and DD-MZM-based Digitized RoF links for different fiber impairments from 2 to 40 km. The measured Q-factor has been found as 22.026 dB and 23.028 dB for MZM and DD-MZM-based Digitize RoF Link, respectively. DD-MZM-based digitized RoF link shows the enhanced eye pattern in terms of signal-to-noise ratio for used fiber impairments.

8. **Manish Bhardwaj, Shweta Singh, Shivali Tyagi, Arun Tripathi, Yu-Chen Hu, Rajesh Kumar Tewari, Anupama Sharma, "A Novel Architecture for the Smart Pedestrian Crossing in Cities Using IoT-Based Approach", Mathematical Problems in Engineering, vol. 2023, Article ID 7334013, 9 pages, 2023. https://doi.org/10.1155/2023/7334013**

Pedestrian crossings have also been highlighted as one of the most dangerous locations in the transportation field. Because people and vehicles share the road, a crosswalk improves the road's efficiency in a densely populated region. However, as the population grows, more accidents and serious injuries occur, and as a result, nationalities are attempting to reduce these incidents through marketing and legal fines. Various architectures and developmental models have been proposed by authors focusing on the safeguarding of pedestrians crossing the intersections and vehicles passing by. Few proposed machine learning and deep learning-based solutions to the pedestrian lanes; others provided an Internet of Things- (IoT-)-based solution to the situation. Various challenges are left unresolved, such as evidence recording, image capturing, and recognition in case of an emergency. In the proposed scenario, an IoT-based technology is utilized to assist the vehicles passing by to act over the signals depicted as a red light focusing on a real-time architecture. The proposed system will be mounted along the roadside at the traffic light pole. The system comprises various refined quality components, such as a gesture control module, High high-definition camera module, etc. Based on the decision drawn from the gesture module, a specific signal will be displayed with the help of a traffic light to assist the vehicles passing by to safeguard the people crossing the proposed smart pedestrian crossing.

9. **Manish Bhardwaj, Kailash Nath Tripathi, Yogendra Narayan Prajapati, Analp Pathak, "Analysis of neural network and neuromorphic computing with hardware: A Survey", Computational Techniques in Neuroscience, Ist Edition, 2023 CRC Press.**
The term "neuromorphic computing" has grown to encompass several distinct types of hardware and software that take cues from the human brain and so offer an alternative to the standard "von Neumann" design. By taking cues from nature, scientists have developed artificial neural networks with extensive connectivity that may be utilized to simulate neural circuits and tackle difficult machine-learning tasks. The commitment of the technology is to create applications with neurological expertise, but the engineering challenges are substantial. These difficulties range from developing a reliable neuroscience model of the brain's operation to discovering materials and engineering breakthroughs to build devices to support these models. The purpose of this paper is to present a historical overview of neuromorphic computing research and its underlying motives. The authors begin with a 35-year retrospective on the inspirations and forces behind neuromorphic computing and then examine its primary research domains, which are categorized as neuro-inspired models, algorithms and learning approaches, hardware and devices, enabling systems, and applications. This study wraps up with a high-level assessment of the most pressing research questions that must be answered in the next years if neuromorphic computing is to live up to its promise. The purpose of this study is to present a comprehensive overview of neuromorphic computing research since the term's introduction and to encourage additional study by shedding light on areas where more study is warranted.

Innovation Spotlights of the Month

<u>Medical Robots</u>

For better targeting and patient safety, surgical robots are replacing traditional procedures. For instance, robot assistance during laparoscopic procedures guarantees that patients have smaller incisions, less blood loss, and quicker recovery times. However, compared to traditional laparoscopy, improved ergonomics and dexterity are advantageous to the surgeon. Robotic cleaners are being used in hospitals and clinics, freeing up healthcare professionals to concentrate on patient involvement. Finally, the use of micro- and nano-bots to deliver treatments that are targeted.

Types of Medical Robots

Surgical Robots: Surgical robots work in tandem with surgeons to complete minimally invasive procedures. These robots consist of tools, equipment, sensors, and software that communicate with each other to form an interconnected ecosystem that can deliver insights and inform a surgeon's decisions.

Service Robots: Service robots perform basic non-patient-facing tasks to streamline the operations side of healthcare organizations. Employing artificial intelligence and sensors, these robots learn to navigate their surroundings and interact with patients and hospital personnel. They can perform simple functions like transporting materials, supplying teams with personal protective equipment (PPE), and delivering supplies and medications to patients.

Exoskeleton Robots: Exoskeleton robots act as suits that attach to human users, consisting of sensors, levers, motors, and other components that enable motion. These kinds of medical robots rely on sensors to detect electrical signals within a patient's body, either instigating movement or accommodating a patient's movements.

Rehabilitation Robots: Similar to exoskeleton robots, rehabilitation robots depend on sensors to detect electrical signals along a patient's skin, activating motors to either assist with motion or perform the desired movements for the patient. The main difference is that these robots specialize in helping patients recover lost abilities and regain bodily control and autonomy.

Social robots: Social robots are designed to sustain more complex interactions with humans, often exhibiting human features to convey and evoke appropriate emotional responses. These robots are equipped with AI and machine learning, as well as sensors and cameras, to process human words and actions and deliver responses based on context.

Source: www.builtin.com

Japan successfully launches next-gen H3 rocket

On February 18th, 2023, the Japan Aerospace Exploration Agency (JAXA) announced the successful first orbital launch of its next-generation H3 launch vehicle. The new flagship rocket delivered its test payload into intended orbit after two prior failed launch attempts in 2022.

About H3 Rocket

The H3 rocket has been under development for over a decade by JAXA and Japanese manufacturer Mitsubishi Heavy Industries as a successor to the reliable H-IIA rocket used since 2001. It is designed for flexible and cost-effective satellite launches.

Unlike the reusable Falcon 9, the H3 is expendable, but scientists say the trial of its world-first technology is significant.

Advanced Capabilities

With high thrust and versatility to carry different payload configurations, H3 aims to secure Japan's independent space access while competing globally as a rival to overseas commercial rockets like SpaceX's Falcon 9. H3's capabilities can cover a full range of missions including cargo transport.

Maiden Flight Payloads

The rocket carried an advanced optical data relay satellite and an infrared observation microsatellite for detecting factory emissions during its test flight. Both were later confirmed as accurately separated into intended orbits by JAXA, validating launch performance.

Previous Launch Setbacks

High hopes for the H3 suffered after its first launch attempt in February 2022 was aborted at ignition. The second test flight in March 2022 also faced technical problems resulting in the rocket's destruction after take-off. Improvements were made subsequently.

Significance of Success

Achieving success in the ambitious maiden journey highlights JAXA's perseverance and boosts Japan's credibility as a competitive spacefaring nation with capacities across engineering, science, and exploration.

Japan's Growing Space Activity

The flawless H3 flight comes after recent feats like Japan's SLIM probe successfully landing on lunar surface last month and plans for Mars moon sample return mission, underscoring its advancing space technology status.

Future Launch Applications

With flexibility to host differently sized satellites, the tested H3 can launch future communications, observation, and scientific missions. It promises cost-efficiency compared to overseas commercial launch options that Japan currently relies on.

Source: https://www.gktoday.in/japan-successfully-launches-next-gen-h3-rocket/

PM Names 4 astronauts for Gaganyaan Mission

Introducing the astronauts to the world for the first time, Prime Minister Narendra Modi said they were the "four forces" who will carry on their shoulders the aspirations of 1.4 billion people of India.

Prime Minister Narendra Modi on Tuesday introduced to the world India's four "astronaut designates", elite fighter pilots of the Indian Air Force (IAF), who have been selected to be sent to space as part of India's first human-crewed spaceflight – the Gaganyaan mission.

The four astronauts – IAF's group captain Prasanth Balakrishnan Nair, group captain Ajit Krishnan, group captain Angad Pratap and wing commander Shubhanshu Shukla – have been training extensively for the Gaganyaan mission for the last five years in Russian and Indian facilities. They were awarded "Antriksh Yatri Pankh" (astronaut wings) by the Prime Minister at a ceremony on Tuesday.

Prime Minister emphasised "After over 40 years, Indians will be travelling to space again. But this time, the countdown and the rocket will all be ours,"

Cosmonaut Rakesh Sharma remains the only Indian to ever travel to space. He flew on-board the Russian-made Soyuz spacecraft in 1984.

ISRO chairperson S Somanath said that work for Gaganyaan is progressing at "lightning speed", and the mission is expected to take flight by 2025. "We will have at least one uncrewed flight for Gaganyaan this year," he said.

About GaganYaan

Gaganyaan is a mission by the Indian Space Research Organisation (ISRO).

Gaganyaan will circle Earth at a low-earth-orbit at an altitude of 300-400 km from earth for 5-7 days.

Payloads:

The payload will consist of:

Crew module - spacecraft carrying human beings.

Service module - powered by two liquid propellant engines.

It will be equipped with emergency escape and emergency mission abort.

Launch:

GSLV Mk III, also called the LVM-3 (Launch Vehicle Mark-3,) the three-stage heavy lift launch vehicle, will be used to launch **Gaganyaan** as it has the necessary payload capability.

About GSLV Mark III:

- It is a **3-stage** heavy lift launch vehicle developed by ISRO.
- The vehicle has **2 solid strap**-ons, a **core liquid** booster and a **cryogenic upper stage**.
- It is designed to carry **4-ton class of satellites** into **Geosynchronous Transfer Orbit** (GTO) or about **10 tons** to **Low Earth Orbit** (LEO), which is about twice the capability of the GSLV Mk II.

Trained in Russia:

- In June 2019, the Human Space Flight Centre of the ISRO and the Russian government owned **Glavkosmos** signed a contract for the training, which includes Russian support in the selection of candidates, their medical examination, and space training.
- The candidates will study in detail the systems of the **Soyuz manned spaceship**, as well as be trained in short-term weightlessness mode aboard the **Il-76MDK aircraft**.

- The **Soyuz is a Russian spacecraft**. The Soyuz carries people and supplies to and from the space station.
- The **Il-76MDK** is a military transport plane specially designed for parabolic flights of trainee astronauts and space tourists.

Wi-Fi 6 Module For Next-Generation IoT Applications

u-blox has unveiled the NORA-W4 module, designed to cater to the growing demands of the Internet of Things (IoT) market. The module stands out with its integration of advanced wireless technologies, including Wi-Fi 6, Bluetooth Low Energy 5.3, Thread, and Zigbee. It is an ideal solution for many IoT applications such as smart homes, asset tracking, healthcare, and industrial automation. The compact module, measuring just 10.4 x 14.3 x 1.9 mm, is built on the Espressif ESP32-C6 System-on-Chip and is a single-band tri-radio Wi-Fi 6 module.

It is designed to enable battery-powered IoT nodes to operate directly over Wi-Fi, eliminating the need for a Bluetooth gateway and thus reducing system-level costs. This feature is particularly beneficial for wireless battery-operated sensors and other similar applications.

The key features include:

- Incorporates Wi-Fi 6, Bluetooth Low Energy 5.3, Zigbee, and Thread connectivity
- Features Wi-Fi 6 Target Wake Time and support for low-power peripherals
- Comprehensive security features for enhanced protection
- Compact design with various antenna choices and compatibility with other NORA modules
- Supports Matter protocol over Wi-Fi or Thread
- Certified for global use.

One of the key advantages of the module is its use of Wi-Fi 6 technology, which is optimized for IoT environments. This technology helps to reduce network congestion in crowded settings such as factories, workplaces, and warehouses, leading to improved throughput and reduced latency. The module is also fully backwards compatible with Wi-Fi 4, ensuring usability even in infrastructures that have not been upgraded. In addition to its wireless capabilities, it supports the Matter protocol, Thread, and Zigbee technologies, enhancing interoperability with other Matter-enabled smart home devices. Its small form factor allows for flexibility in design, catering to device size constraints. The module is also compatible with the company's other modules, facilitating seamless technology migration, for example, from Wi-Fi 4 to Wi-Fi 6.

Security is a top priority for the module, with features such as secure boot, a trusted execution environment, and flash encryption. The module has six variants, offering options for open CPU or u-connect Xpress, antenna pin or PCB antenna, and 4MB or 8MB flash memory. Early samples are currently available, with volume production expected to commence in the second half of 2024. This launch marks a significant milestone for u-blox in its commitment to providing cutting-edge solutions for the IoT market.

Source: **https://www.electronicsforu.com/news/wi-fi-6-module-for-next-generation-iot-applications**

KIET (R&D) Policies

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

Salient Features of KIET (R&D) Research Policy

Incentive for the Publication in SCI/SCIE Indexed Journals (for faculty)

S. No.	Categories	Conditions	Incentive (in Rs.)
1.	Outstanding Research Publication Incentive	Publication in, Nature (British Multidisciplinary Scientific Journal), Science Academic Journal of the American Association, Harvard Business Review	25,000 /-
2.	Premier Research Publication Incentive	Paper must be published in SCI/SCIE/SSCI, American Mathematical Society, American Physical Society, American Society for Civil Engineers (ASCE), American Society for Mechanical Engineers (ASME), American Society of Testing Materials (ASTM), Association for Computing Machinery (ACM) Transactions, IEEE Transactions/ Journals/ Letters/ Reviews, IET Transactions/ Journals/ Letters/ Reviews, Institute of Civil Engineering Publishing, London, Institute of Mechanical Engineering, London. In addition to the above list the SCI/ SCIE/SSCI journals with impact factor>= 7 will be considered	21,000 /-
3.	Commendable Research Publication Incentive	Impact factor between 5 to 6.99 and indexed in SCI/ SCIE/ SSCI	15,000 /-
4.	Admirable Research Publication		11,000/-

S. No.	Categories	Conditions	Incentive (in Rs.)
	Incentive for SCI	Impact factor between 0.750 to 4.99 and indexed in SCI/ SCIE/ SSCI	
5.	Gratifying Research Incentive for SCI	Impact factor between 0.250 to 0.499 and indexed in SCI/ SCIE/ SSCI	5000/-
6.	Admirable Research Publication Incentive for SCOPUS	Quality research published in SCOPUS having Cite Score 3 and above	5000/-
7.	Valuable Research Publication Incentive for SCOPUS	Quality research published in SCOPUS having Cite score 2 to 2.999	4000/-
8.	Gratifying Research Incentive for SCOPUS	Quality research published in SCOPUS having Cite score 1.000 to 1.999	3000/-

Incentive for Publication in eSCI and CCR Expanded (for faculty)

S. No.	Categories	Conditions	Incentive (in Rs.)
1	eSCI indexed Journal	Quality research published in eSCI Journals is applicable for publications in any ESCI/CCR-Expanded journal, and a maximum of one ESCI/CCR-Expanded indexed research paper in an academic year shall be considered.	2000 -

Incentive for Students

- Incentive amount of Rupees Two Thousand **(Rs. 2000/-)** is applicable to student authors for **publications in SCOPUS Journals.**
- Students may claim a registration fee + T.A. (as per institute policy) or Rs. 1000/- whichever is less for publication of conference papers in Scopus Indexed conference.
- Furthermore, as per student policy for final year projects, students can claim 50% of the registration fee charges for publication in Scopus indexed conference.

Note: For Annexures and more details kindly refer:

https://www.kiet.edu/Research%20and%20Development%20Policy

Patents Granted

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Delhi-NCR, Ghaziabad

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GEOGRAPHICAL INDICATIONS

Congratulations

On receiving grant certificate from Govt. of India
for Patent Titled "Portable Automated Electric Vending Machine"

Dr. Harsh Khatter
Associate Professor
Computer Science (CS)

Date of Grant
18th December 2023
Application No. - 202211021959

The legacy of KIET is its consistent acquisition of esteemed patents

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GEOGRAPHICAL INDICATIONS

Congratulations

On receiving grant certificate from Govt. of India
for Patent Titled "Agro Utility Vehicle"

Dr. Brijesh Singh
Associate Professor
Electrical & Electronics
Engineering (EN)

Date of Grant
10th October 2023
Application No. - 202011056703

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Congratulations

On receiving grant certificate from Govt. of India
for Patent Titled "System & Method for a Safety Helmet"

Dr. Ankit Verma
Assistant Professor
Computer Applications (CS)

Date of Grant
28th February 2024
Application No. - 202011026119

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Congratulations

On receiving grant certificate from Govt. of India
for Patent Titled "Method for Developing Chemical-Induced Skin Carcinoma Model Organism"

Dr. Abhishek Kumar
Assistant Professor
KIET School of Pharmacy
(KSOP)

Date of Grant
13th December 2023
Application No. - 202211041071

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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
6	D-Link Global Center of Excellence	IT, CS, MCA
7	Centre for Automotive Mechatronics in association 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 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

S CHANDRASEKHAR, THE MAN BEHIND THE STARS
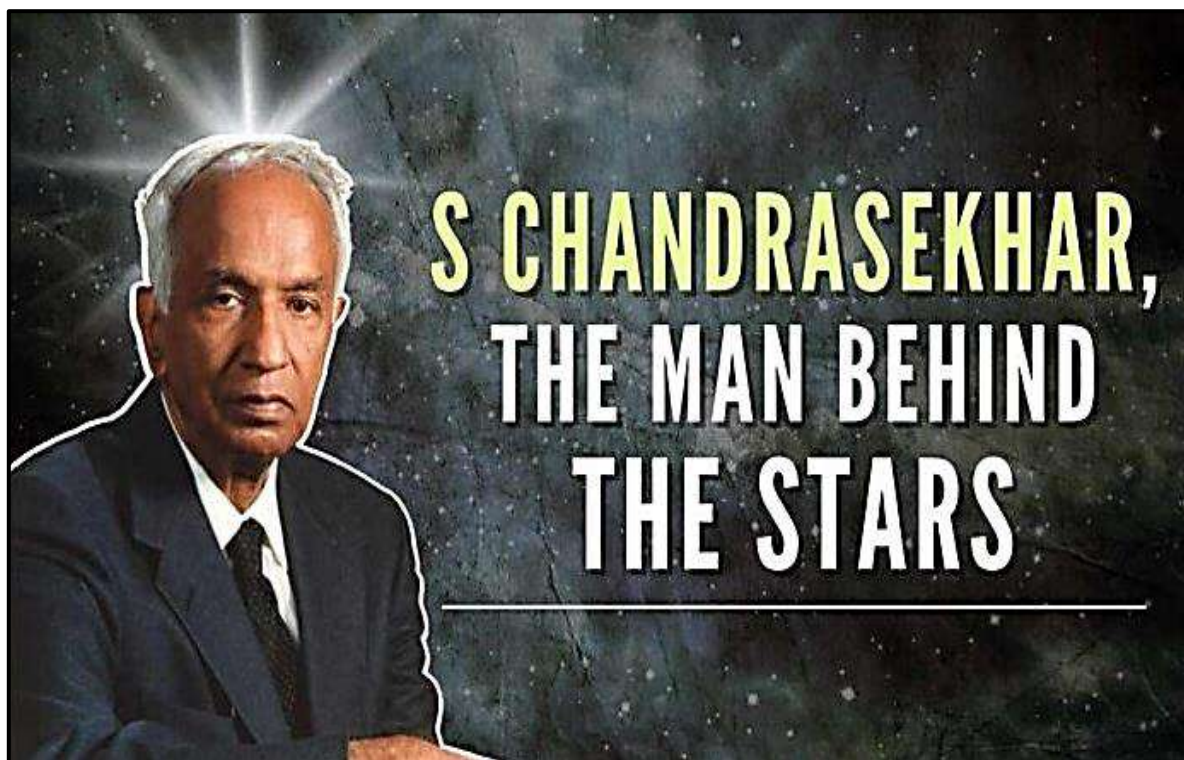
Subrahmanyan Chandrasekhar (19 October 1910 – 21 August 1995) was an Indian-American theoretical physicist who spent his professional life in the United States.

He was awarded the **1983 Nobel Prize** in physics along with William A. Fowler for "Theoretical studies of the physical processes of importance to the structure and evolution of the stars".

Chandra theorised many concepts and inventions, the most prominent being the "**Chandrasekhar Limit**", which defined the maximum mass of a dwarf star set at 1.39 (~1.4) times the mass of the Sun (1.988 × 1030 kg), which is 2.765 × 1030 kg.

Up to this limit, the white dwarf stars remain stable, after which they become black holes on collapse following a supernova. He calculated the limit during his first voyage in 1930 from India to Cambridge University, for his graduation. Over the decades, Chandra's work on the collision of stars became reality when the Event Horizon Telescope released two pictures of black holes that were born out of dead stars.

In 1979, NASA named the third of its four Great Observatories after Chandrasekhar.

Chandra's father was a government official, while his mother a litterateur. He's also the nephew of legendary Indian physicist Sir CV Raman.

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