Prof. D.K. Dwivedi
Professor and Head
Physics and Material Science Department
Madan Mohan Malaviya University of
Technology, Gorakhpur, U.P.

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 7500+ 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)

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Message from the Face of Cover Page

Dear Colleagues,

I extend my heartfelt congratulations to the KIET Group of Institutions on the momentous achievement of publishing your Research Magazine "अनुसंधान." This milestone stands as a testament to your unwavering dedication and commitment to pushing the boundaries of knowledge and fostering innovation in research and development.

I am deeply impressed by the remarkable achievements of the KIET Group of Institutions, which have significantly influenced the future landscape of scientific inquiry and technological advancement. Their contributions have set an exemplary standard for research and development endeavors, inspiring others to follow suit.

As we work in the development and characterization of optoelectronic devices. Phase change memory (PCM) devices offer promising opportunities for environmental applications due to their unique properties and capabilities. Solar cells play a vital role in promoting environmental sustainability by providing clean, renewable energy while mitigating climate change, reducing carbon emissions, conserving resources, and fostering energy independence and economic growth. By providing real-time data on environmental conditions, sensors play a crucial role in environmental monitoring, management, and decision-making, helping to protect human health, safeguard ecosystems, and ensure sustainable use of natural resources.

Additionally, I am excited to emphasize the significant potential for collaborative research between faculty members of KIET and MMMUT. This partnership provides a solid foundation for pooling our resources, expertise, and knowledge to address intricate research challenges. Through our joint efforts, we can embark on a voyage of exploration and creativity, yielding impactful outcomes for society and the environment alike.

I extend my sincere best wishes to KIET for your forthcoming endeavors in research and development. May our collective efforts serve as a source of inspiration and motivation, fostering positive change within the scientific community.

Warm regards,

Prof. D.K. Dwivedi

Professor and Head

Physics and Material Science Department

Madan Mohan Malaviya University of Technology, Gorakhpur, U.P.

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 Academics

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

Interactive Session on Project Proposal Writing and Funding Opportunities

Dean (Research and Development) office, KIET Group of Institutions, Delhi-NCR, Ghaziabad has organized Interactive Session on "R&D Project Proposal Writing and Funding Opportunities" on 27.04.2024 in R&D Meeting Hall, B-Block (B-104). Eminent Guests was Dr Sanjay Pandey (Head, AERDB, DRDO) and Dr Brajesh Mishra (Head Grant, CDOT).

MoU between KIET and L & T EduTech

MOU signed on **17-05-2024** between KIET Group of Institutions and L&T EduTech for an integrated program on *Advanced Specialization on Electric Vehicles* for core branch students.

L&T EduTech will set up a state-of-the-art lab on campus and train selected students.

Students completing the program will have placement opportunities at various related companies.

Workshop on MATLAB and Simulink Applications

On 08th May 2024, KIET Group of Institutions hosted a workshop on MATLAB and Simulink Applications, conducted by DesignTech Pvt. Ltd. with Mr. Manoj Kumar as the contact person.

The workshop, coordinated by Mr. Sharad Gupta, Mr. Paramanand Sharma, and Dr. Rochak Bajpai, was attended by 300 students from B.Tech. 2nd and 3rd year.

Students were briefed on MATLAB, Simulink, Simscape, and hardware interfacing, finding the workshop highly informative and encouraging for future technologies.
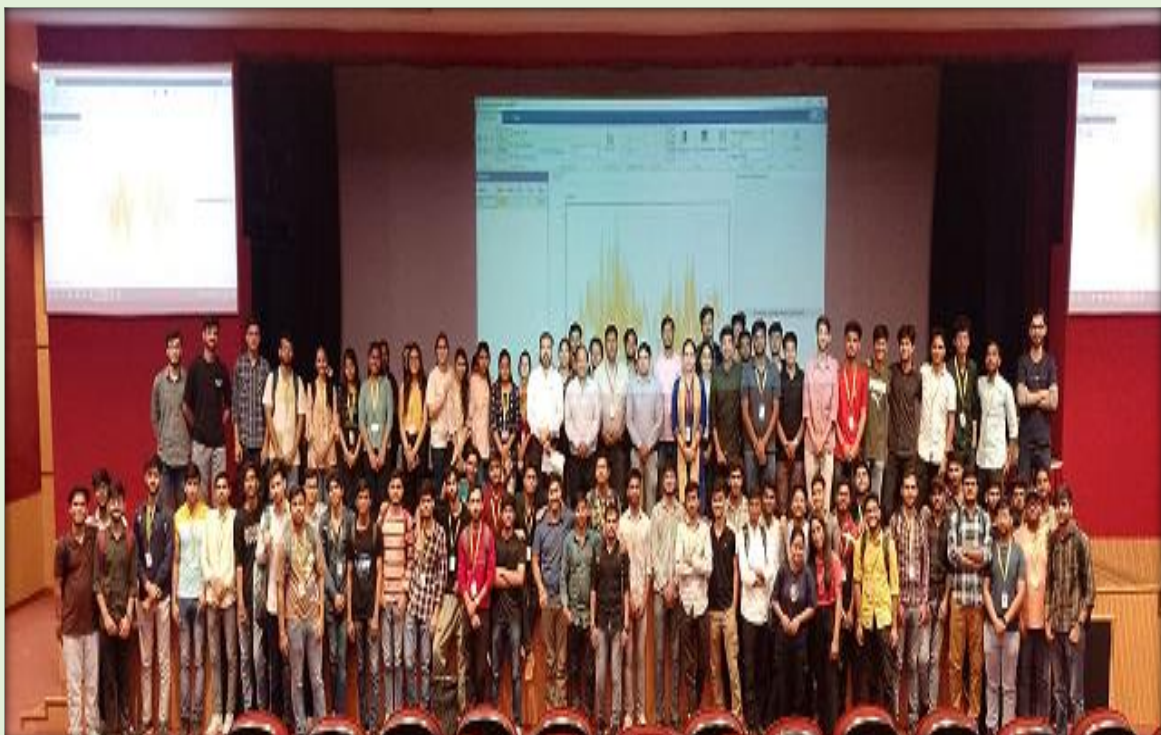
Statistics of KIET Research and Development Activities

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)**

दूरभाष/TEL : 26962819, 26567373
(EPABX) : 26565694, 26562133
: 26565687, 26562144
: 26562134, 26562122
फैक्स/FAX : 26960829, 26529745
सूचना का अधिकार
RIGHT TO INFORMATION Website : http://www.dsir.gov.in
(आईएसओ 9001:2008 प्रमाणित विभाग)
(AN ISO 9001:2008 CERTIFIED DEPARTMENT)

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
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 May 2024.

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*	52*	103*	155*
Total	727	1732	2459

YEARWISE RESEARCH PUBLICATIONS
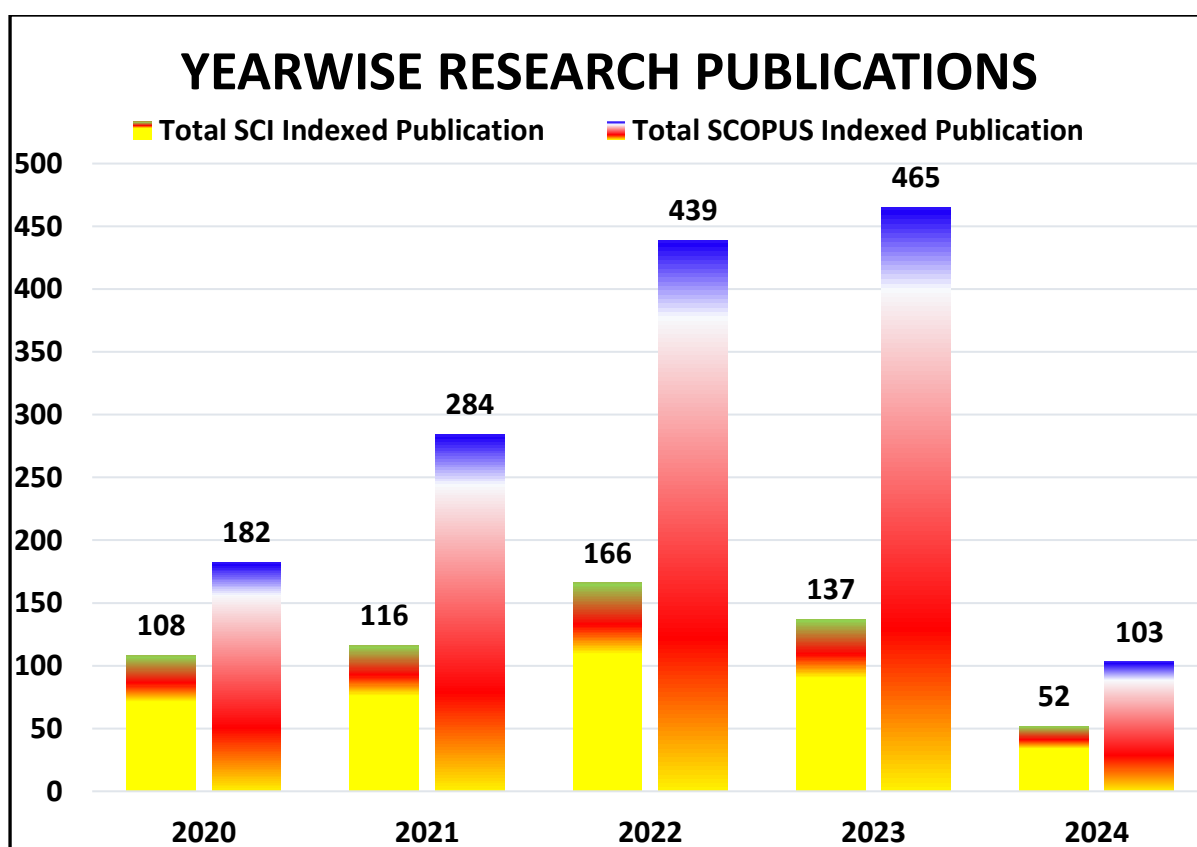
CATEGORY	Number of Publication (2023-24)				
	Jan-24	Feb-24	March-24	April-24	May-2024
SCOPUS Publications	9	8	34	23	29
Web of Science Publication	4	6	9	15	18
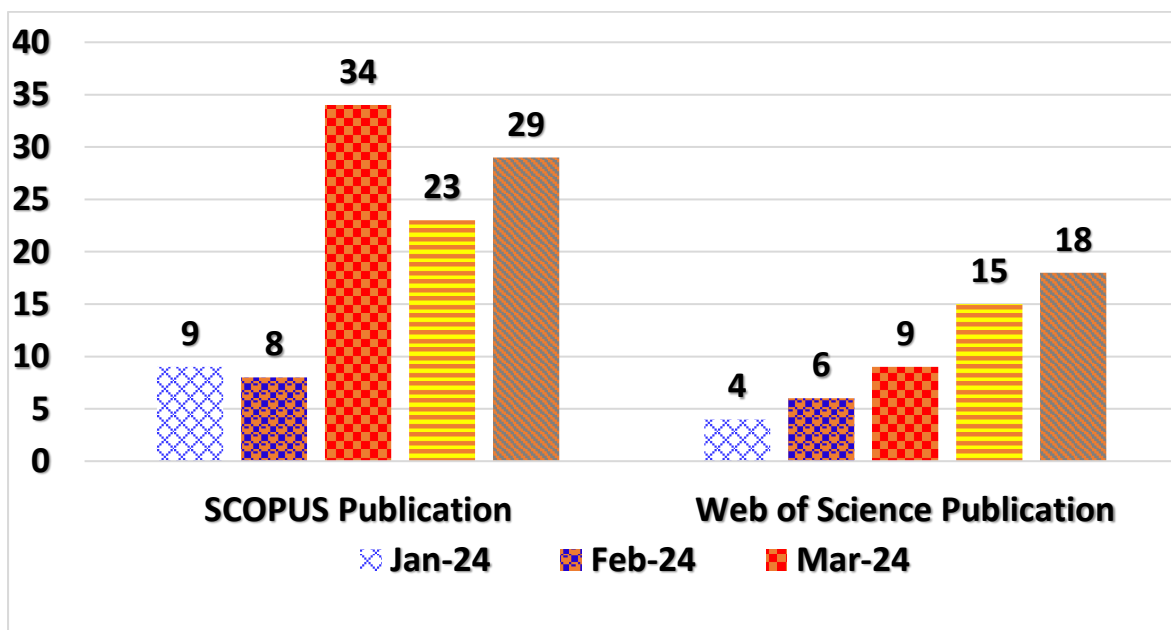
Details of Patents Published/Granted

Title of The Invention: **Automated heartbeat sensing device with integrated alert message system**
Application Number: 202411037084 A (Indian Patent Office)
Applicant(S): IT, KIET Group of institution
Date of Filing: 10-05-2024
Date of Publishing: 17-05-2024
Field of the Invention: The field of Healthcare for the Providing the various services to check and maintain the Heart Beats

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 healthy person's heart and blood circulation are always functioning normally, a heart attack can still happen if the circulation is cut off. Although it is theoretically feasible to utilize a blood pressure sensor to gauge the patient's vitals by tracking their heart rate, doing so is not only cumbersome and awkward, but also yields erroneous results from certain models.

An improved way for guardians or medical staff to keep tabs on a patient's vitals is offered by the current idea. The device has an integrated warning mechanism that alerts them instantly if the patient's heart rate experiences an abrupt increase.

Another object of the present disclosure is to provide an alert system that can detect changes in heart rate on its own, which is much more advanced than current goods on the market. Our system provides an additional level of security and convenience through the use of real-time notifications and alarms, in contrast to the currently existing systems that solely concentrate on monitoring heart rate. This ensures that you will receive a response in a timely manner.
Other objects and advantages of the present disclosure will be more apparent from the following description, which is not intended to limit the scope of the present disclosure.

Summary of the Invention: 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.

Even if the heart and blood circulation of a healthy individual are consistently operating at normal levels, obstruction of the circulation can still result in myocardial infarction. While it is theoretically possible to assess the patient's vital signs by monitoring their pulse rate using a blood pressure sensor, implementing such a method not only causes inconvenience and complexity but also produces inaccurate outcomes in specific models. The current concept presents an enhanced method for family members or medical personnel to monitor the vital signs of a patient. The device is equipped with an integrated warning mechanism that provides immediate notification in the event of a precipitous increase in the patient's heart rate.
An alert system that can autonomously detect changes in heart rate is a distinctive feature of our concept and is significantly more advanced than existing products on the market. Our system enhances convenience and security by incorporating real10 time alerts and

notifications, as opposed to the prevailing systems that are exclusively focused on heart rate monitoring. This guarantees that you will promptly receive a response.
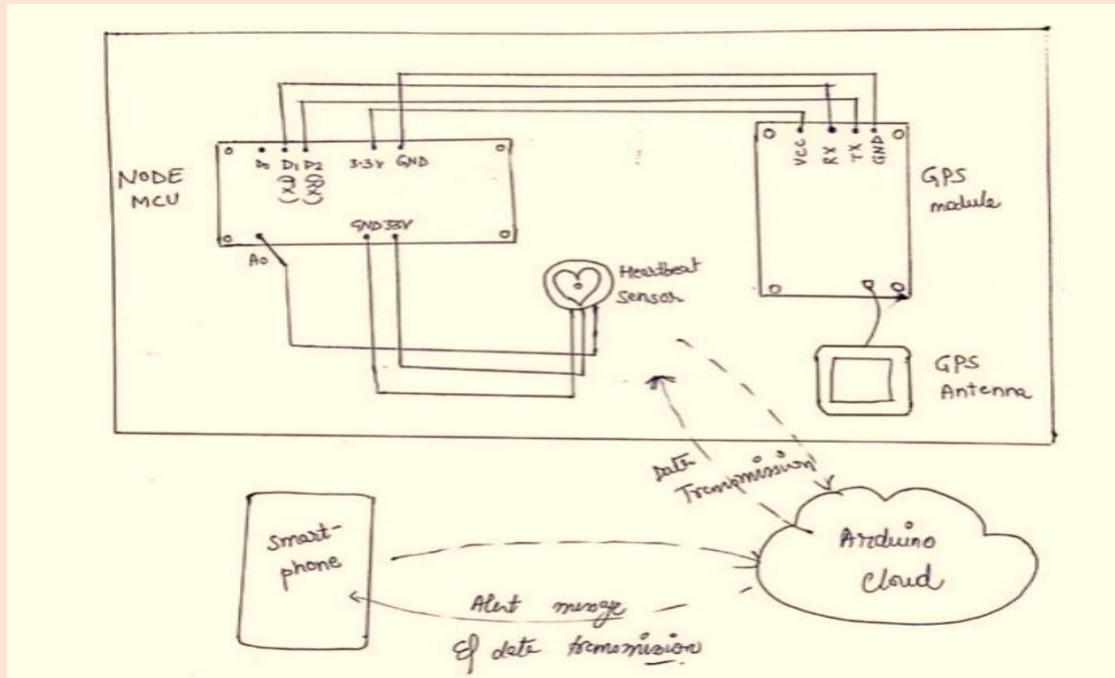
Figure 1: Illustrates an ER Diagram of the proposed invention, in accordance with an embodiment of the present invention.

Title of the Invention: System and method for on-demand home services
Application Number: 202411037046 A (Indian Patent Office)
Applicant(S): KIET Group of Institutions (CS)
Date of Filing: 10-05-2024
Date of Publishing: 17-05-2024
Field of the Invention: The present invention is related to the field of computer science domain, and more paticularly system and method for on-demand home services.

Objective: The demand for home services has grown exponentially as our lifestyles continue to evolve. Homes today is equipped with advanced technologies and various amenities, making them more comfortable and functional. However, this modern convenience comes with the challenge of ensuring that homeowners have access to reliable and efficient home services.

Homeowners across the globe are facing a common challenge: meeting the increasing demand for home services in a rapidly changing world. The need for these services has surged with the rise in population and the ever-advancing technology. Just as India recently became the world's most populous country, the demand for home services is on the rise, posing the question of how to provide these services to everyone who requires them.

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 method that all aimed at enhancing the quality of life and economic stability within our communities

Another object of the present disclosure is to provide a method is to alleviate the impact of unemployment on our society. By creating a comprehensive home services platform, we aim to generate employment opportunities that not only benefit individuals seeking work but also contribute to the overall economic wellbeing of our region.
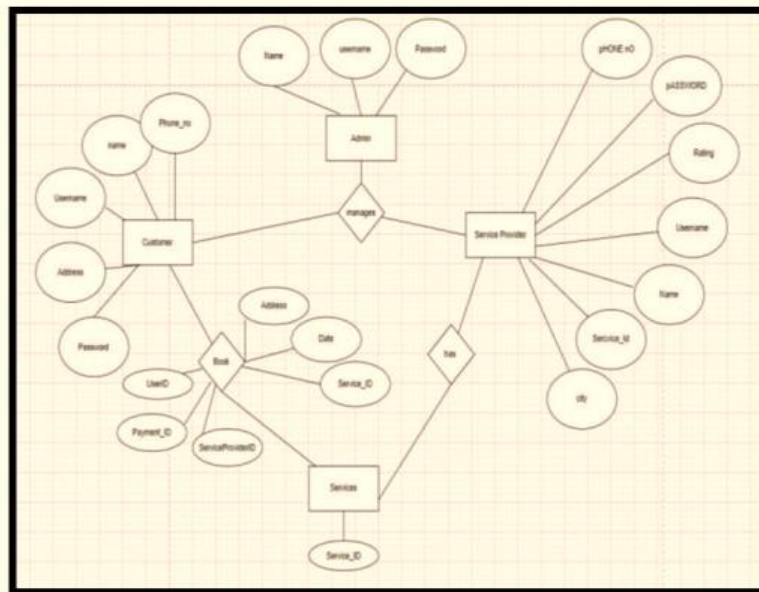
Figure 1: Illustrates an ER Diagram of the proposed invention, in accordance with an embodiment of the present invention.
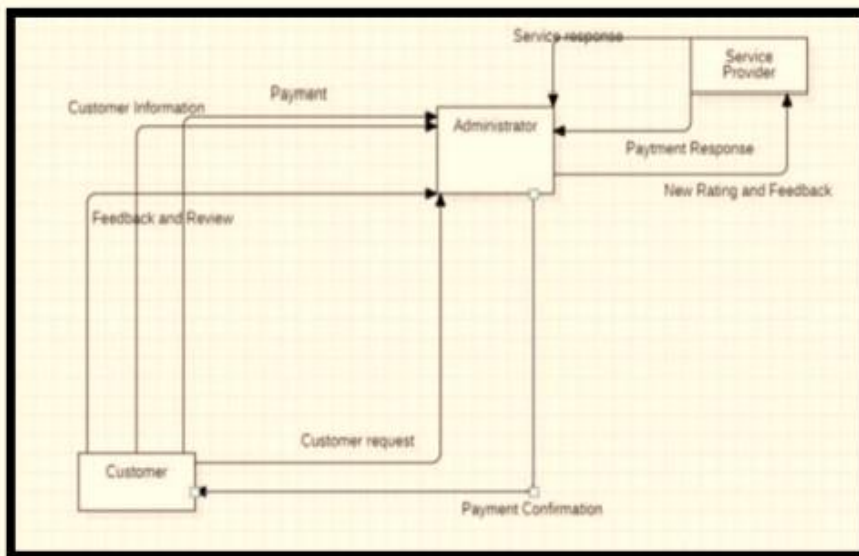
Figure 2: Illustrates Block diagram of the system, in accordance with an embodiment 5 of the present invention

Title of the Invention: **Fastag integrated smart parking management system (FSPMS)**
Application Number: 202411037085 A (Indian Patent Office)
Applicant(S): KIET Group of Institutions (IT)
Date of Filing: 10-05-2024
Date of Publishing: 17-05-2024
Field of the Invention: The present invention is related to computer science field; where the system integrates the FASTag feature of the vehicles for the parking management.
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 The invention gives the innovative parking solution, which combines IoT-based occupancy detection using IR sensors and mandatory FASTag integration to provide real-time guidance, seamless entry and exit, automated payments, and privacy protection, significantly improving the efficiency and user experience of parking facilities. Currently, concern points are:

i. Space Availability Awareness: Traditional parking solutions may not provide real-time information on parking space availability. Drivers may have to circle the parking lot, increasing congestion and frustration.

ii. Payment Hassles: Many parking systems require users to stop at a payment kiosk or meter, interrupting the flow of traffic and causing delays. Cash-based systems can lead to issues with exact change or payment processing.

iii. Inefficient Space Utilization: In traditional parking facilities, space utilization may not be optimized. Drivers may struggle to find parking spaces, while other areas remain underutilized.

iv. Traffic Congestion: Manual parking management, such as attendants directing traffic, can result in traffic jams at peak times.

v. Privacy Concerns: Camera-based parking systems, while effective, may raise privacy concerns as they capture images and video footage of vehicles and drivers.

vi. Inconvenient Valet Services: Valet parking services can be costly and may require drivers to wait for attendants to park and retrieve their vehicles.

vii. Limited Payment Options: Some parking facilities may not offer a variety of payment options, making it less convenient for users who prefer digital payment methods.

viii. Data Utilization: Traditional systems may not make the best use of data to optimize parking space allocation, pricing, and facility management.

ix. Environmental Impact: Older parking systems may not focus on energy efficiency and can have a higher environmental impact.

x. Manual Oversight: Traditional parking systems often require manual oversight and management, which can lead to human errors and increased operational costs.

Figure 1: It represents working model in the present invention with its prototype., in accordance with an embodiment of the present invention.

Title of the Invention: **Smart method for non-fungible token thereof**
Application Number: 202411037045 A (Indian Patent Office)
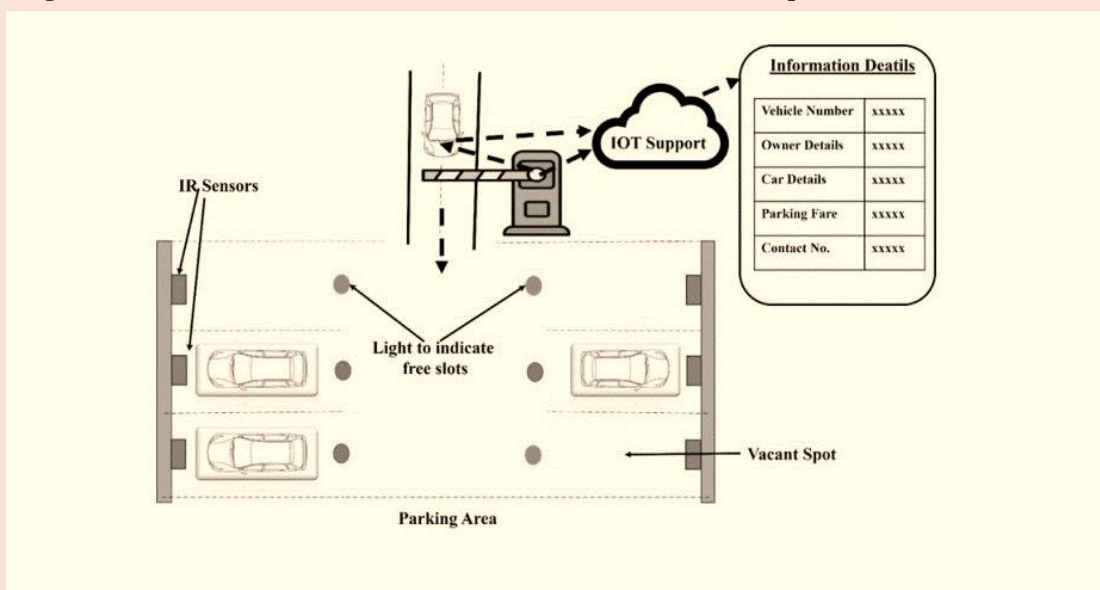**Applicant**(S): KIET Group of Institutions (CS)
Date of Filing: 10-05-2024
Date of Publishing: 17-05-2024
Field of the Invention: The present invention relates to the field of computer science, especially web application and security.
Objective of the Invention: Some of the objects of the present disclosure, 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 a method is to make an animated guide for the home workout for the persons. Another object of the present disclosure is to provide a method is a WEB 3.0 music platform that makes the creator and user an ad-free platform. Any music artist can mint their fabulous art on the platform and showcase it to the world with any intervention of Music Studio.
Another object of the present disclosure is to provide a method that of creating this scheme app is that artists don't get the amount, importance, and fame they deserve.
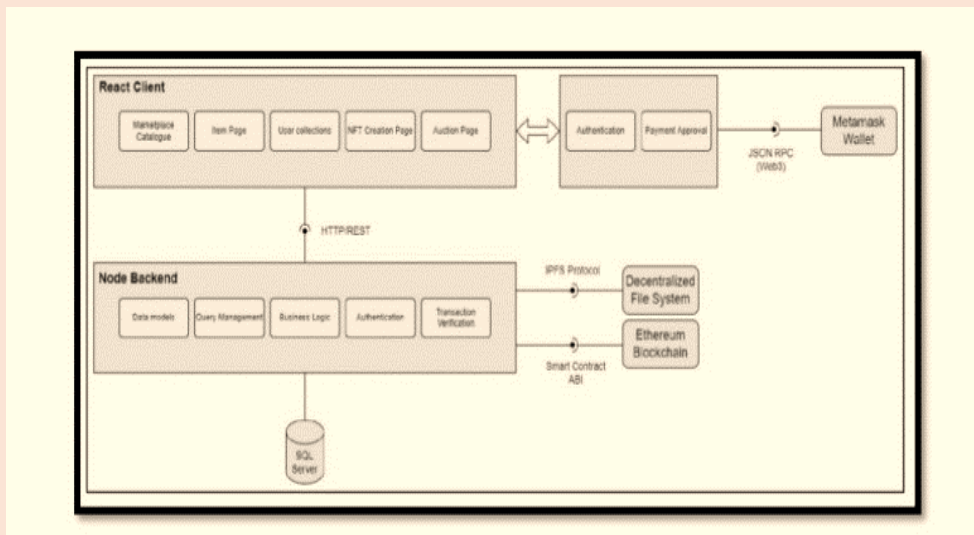
Figure 1: Illustrates a workflow of the present disclosure, in accordance with an embodiment of the present invention

A huge amount is slashed by big music firms like T-Series, Sony Music, etc. Other objects and advantages of the present disclosure will be more apparent from the following description, which is not intended to limit the scope of the present disclosure.

Title of the Invention: **A novel method for criminal face detection using machine learning based system**
Application Number: 202411030531 A (Indian Patent Office)
Applicant(S): KIET Group of Institutions (CSIT)
Date of Filing: 16-04-2024
Date of Publishing: 10-05-2024
Field of the Invention: The field of Image Processing for the detection of Criminal Face.
The instant invention relates to the field of Criminal Face Identification using Image Processing. The current invention involves the Assessment of different kind of Criminals

present in the World for the Identification regarding crimes. The present10 invention is more specifically linked to Innovation in Assessment Process of the Different Criminals using Image Processing with machine learning techniques.

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. Utilizing the human capacity to remember minute facial information, this research intends to develop a Criminal Face Detection system. This will be accomplished by utilizing human memory. The identification of criminals at the site of a crime can be accomplished in a variety of methods, such as through fingerprinting, DNA matching, or the testimony of eyewitnesses. The most reliable of these approaches is the testimony of eyewitnesses due to the fact that it can withstand examination in a legal setting and is the most cost-efficient approach. Even while it may not be feasible to view the criminal's face in its entirety in the majority of circumstances, it is nevertheless conceivable for witnesses to a crime to have seen the offender who committed the crime.

Summary of the Invention: 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. In the area of video-based systems with aspects of recognition, tracking, and integration, there had been important efforts. Additionally, fresh datasets are being created for the analysis and assessment of the recognition methods. It is not an exaggeration to say that the majority of applications currently in existence recognize faces and their features on demand, and we are working to make these applications more successful and useful in many areas of science and study.

PROCESS DESCRIPTION

```
                              ( Start )
                                 |
        +------------------------+------------------------+
        |                                                 |
+------------------+                            +------------------+
| Real time        |                            | Real time        |
| Captured Image   |                            | Captured Image   |
+------------------+                            +------------------+
        |                                                 |
        +--------------->  Registered Face Image  <-------+
                                 |
                          < If Image present     > --No--> ( DB )
                          < in Database? >   Enter into DB
                                 | Yes
                          Extracting Features
                                 |
                          Compared with DB images
                                 |
                          Identified Matching Record
                                 |
                              ( End )
```

Title of the Invention: Integrating quantum computing into QSAR analysis for drug discovery

Application Number: 202411030528 A (Indian Patent Office)

Applicant(S): KIET Group of Institutions (CS, KSOP)
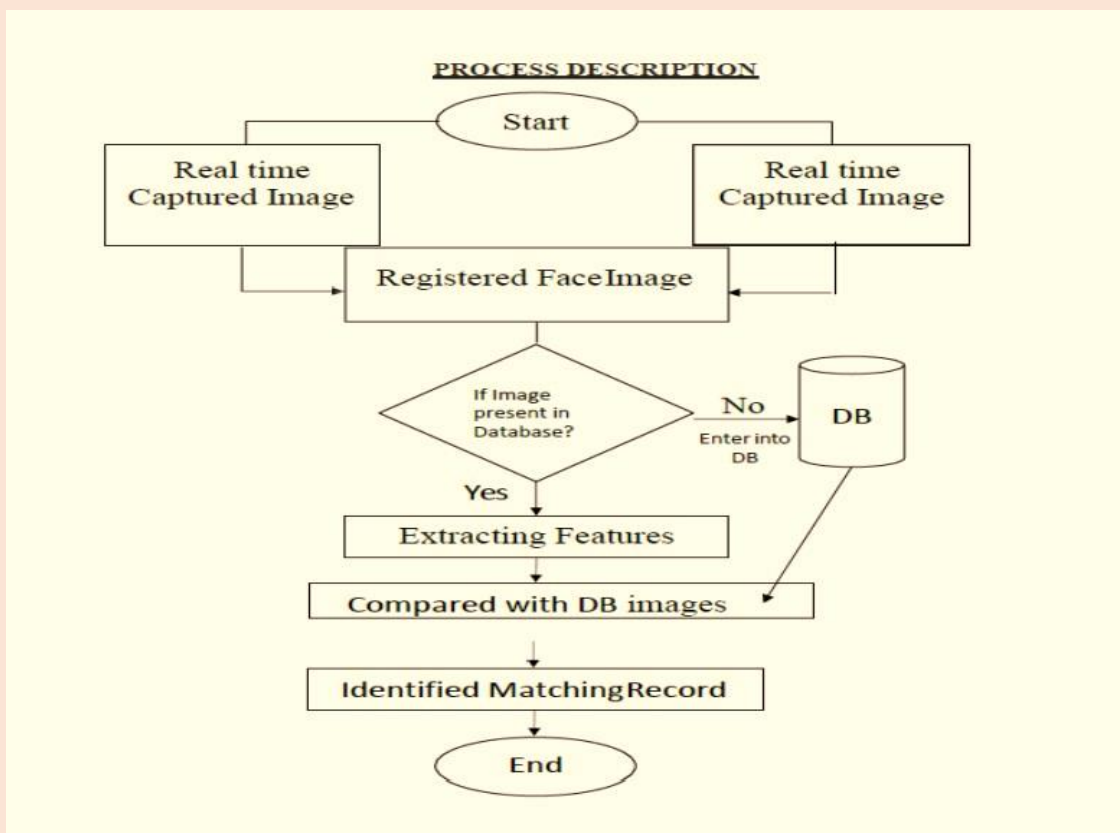**Date of Filing**: 16-04-2024
Date of Publishing: 10-05-2024
Field of the Invention: The present invention is related to the QSAR Analysis for Drug Discovery using Quantum computing field.
Objects of the Invention: Some of the objects of the present disclosure, which at least one embodiment herein satisfies, 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. Utilize the immense processing capabilities of quantum computers to handle complex calculations involved in QSAR analysis, enabling the exploration of larger chemical spaces and more intricate molecular interactions.

Leverage quantum algorithms to enhance the accuracy of predicting molecular interactions and biological activities, leading to more reliable QSAR models and reducing the need for extensive experimental validation.

Other objects and advantages of the present disclosure will be more apparent from the following description, which is not intended to limit the scope of the present disclosure.

Summary of the Invention: 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 present invention is generally directed to the integration of quantum computing into QSAR analysis significantly improves predictive accuracy in drug discovery by harnessing quantum algorithms to model complex molecular interactions with superior precision and capturing intricate relationships within chemical datasets.

An embodiment of the present invention is for the incorporation of quantum computing expedites drug discovery timelines by leveraging quantum parallelism and computational speed, enabling the rapid screening and identification of potential drug candidates with desired pharmacological properties, thus reducing the time-to-market for novel therapeutics.
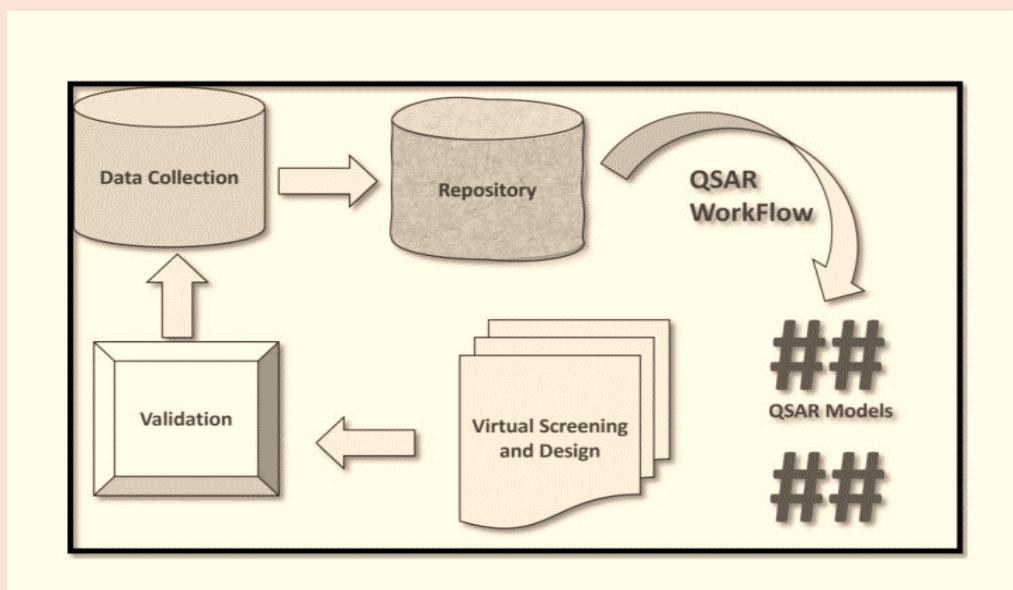
Figure 1: Showing the input parameter; system which is to be processed by the system

Title of the Invention: Affordable farm equipment sharing platform
Application Number: 202411030536 A (Indian Patent Office)
Applicant(S): KIET Group of Institutions (CS)

Date of Filing: 16-04-2024

Date of Publishing: 10-05-2024

Field of the Invention: The present invention pertains to the domain of agricultural technology and addresses a critical need within this sector. Specifically, it introduces a novel system and method for the efficient sharing of farm equipment among farmers.

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. To create an accessible, web-based platform that connects farmers seeking specific types of farm equipment with equipment owners who are willing to share or rent their machinery. To substantially reduce the financial burden on small and medium-sized farmers by enabling them to access required farm equipment at a fraction of the cost of ownership. Other objects and advantages of the present disclosure will be more apparent from the following description, which is not intended to limit the scope of the present disclosure.

Needs Assessment and Problem Definition

↓

Quantum Computing Infrastructure Setup

↓

Data Preprocessing and Feature Selection

↓

Quantum Algorithm Development

↓

Hybrid Quantum-Classical Model Integration

↓

Model Training and Validation

↓

Optimization and Scalability
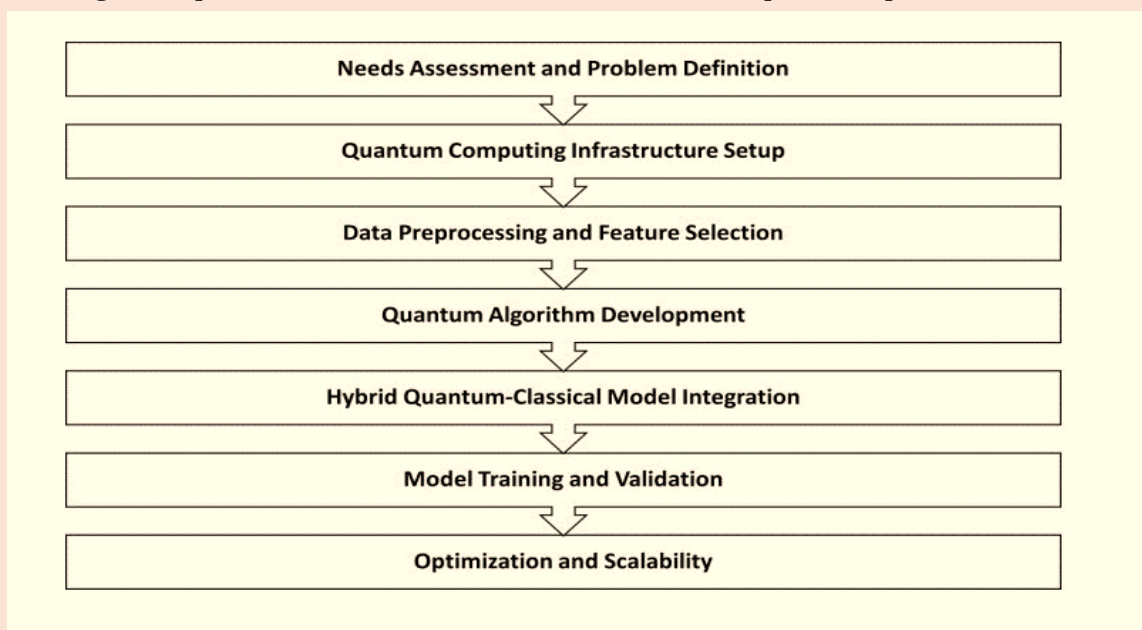
REGISTRATION OF DESIGN:

Title of the Invention: IOT enabled audio player integrated printer

Application Number: 412704-001 (Indian Design)

Applicant(S): Dr. Dilkeshwar Pandey, Dr. Sanjiv Sharma, Dr. Amit Kumar Gupta (CSE)

Date of Filing: 05-04-2024

Date of Registration: 24-05-2024

Title of the Invention: Mobile charger with holder

Application Number: 386057-001 (Indian Design)

Applicant(S): Dr. Kiran Sharma (KSOP)

Date of Filing: 11-05-2023

Date of Publishing: 24-05-2024
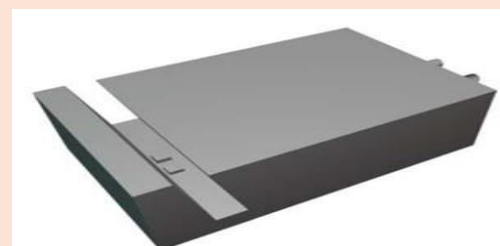
Title of the Invention: Laboratory Apparatus SET
Application Number: 397644-001 (Indian Design)
Applicant(S): Prof. (Dr.) N. G. Raghavendra Rao, Dr. Monika Kaurav, Mr. Ayush Asthana, Ms. Anshika Malik (KSOP)
Date of Filing: 14-10-2023
Date of Publishing: 17-05-2024

PATENTS Published – May 2024

S. No.	Title Of Patent	Dept.	Name Of Applicant	Date Of Publication	Status
1.	Signature and anomaly based web application firewall	CS	Mr. Abhishek goyal, Ms. Prachi sharma, Ms. Manya varshney, Ms. Priyansha singhal, Dr. Gaurav Dubey	03-05-2024	Published
2.	Energy-efficient building designs using sensor-embedded building envelopes	CS	Dr. Gaurav Dubey	10-05-2024	Published
3.	System and method for human drowsiness detection	CS	Mr. Daksh Kumar, Mr. Ashu Verma, Mr. Chandan Kumar Gupta , Ms. Kalpna Sagar , Mr. Harsh Khatter	10-05-2024	Published
4.	System and method for developing smart city solutions using IOTand AI	CS	Mr. Amit Kumar Singh Sanger	10-05-2024	Published
5.	System and method for AI-assisted plant disease detection, crop and fertilizer recommendation system	CS	KIET, Mr. Yash Srivastava, Mr. Harsh Srivastava, Ms. Sejal Gupta, Mr. Raj Kumar	10-05-2024	Published
6.	Detection of autism spectrum disorder using machine learning	CSE/ CS	Ms. Nishu Gupta, Ms Mani Dwivedi, Dr. Harsh Khatter , Mr. Anurag Mishra	10-05-2024	Published
7.	A novel method for criminal face detection using machine learning based system	CSIT	KIET, Ms. Archana Singh , Ms. Sakshi Mishra , Mr. Prateek Sharma,	10-05-2024	Published

			Ms. Varsha Singh , Ms. Ashima Arya		
8.	Integrating quantum computing into QSAR analysis for drug discovery	CS, KSOP	KIET, Mr. Anurag Mishra, Ms. Sheena Mehta	10-05-2024	Published
9.	Affordable farm equipment sharing platform	CS	KIET, Ms. Shivani, Mr. Govind Singh, Mr. Aman Raj Singh	10-05-2024	Published
10.	Smart sleep hygiene mattress for critical spondylitis patients	EN	KIET, Mr. Brijesh Singh , Mr. Jitendra Kumar Seth	10-05-2024	Published
11.	MOVEASY – flutter and firebase application	CSIT	KIET, Ms. Sonia Deshmukh, Mr. Lakshay Singhal, Ms. Shreya Rauniyar, Mr. Dhruv Rastogi, Mr. Priyansh Gupta	10-05-2024	Published
12.	Robotic system for multifunctional medical support	ECE	KIET, Mr. Neelesh Ranjan Srivastava, Dr Vibhav Kumar Sachan, Mr. Satya Prakash Singh , Mr. Abhigya Srivastava, Mr. Pratik Kumar, Mr. Sparsh, Ms. Vartika Dubey	10-05-2024	Published
13.	System and method for sarcasm extraction using hybrid LSTM CNN architecture	CS	KIET, Ms. Neha Shukla, Ms. Anjali Jain, Ms. Arti Sharma , Mr. Harsh Khatter , Mr. Saurabh, Mr. Anurag Mishra	10-05-2024	Published
14.	Ziosafe secure authentication app	Cyber Peace Centre	KIET, Mr. Vijay Yadav , Mr. Siddharth Yadav, Dr. Abhinav Juneja, Dr. Arun Kumar Tripathi	10-05-2024	Published
15.	Development of environment friendly aluminium antimonide films for photovoltaic applications	AS	Dr. Sweta Shukla, Dr. Dhirendra Kumar Sharma, Dr. Vipin Kumar, Dr. Kapil Kumar Sharma	10-05-2024	Published
16.	Profit analysis for multistage compressor with multi evaporator	AS	Dr. Neelam Sharma, Dr. Ekata	10-05-2024	Published

	type temperature system				
17.	Gesture-controlled virtual system	CS	Mr. Pardeep Tyagi, Mr. Deepanshu Singh , Mr. Ayush Kumar, Ms. Arushi Gupta , Mr. Harsh Khatter	10-05-2024	Published
18.	Innovative and smart virtual interactive board	CS	KIET, Mr. Pardeep Tyagi, Mr. Vaibhav Mittal , Mr. Vaibhav Singh, Mr. Sarthak Srivastava	10-05-2024	Published
19.	A systematic approach to strengthening english proficiency and communication skills in students	HSS	Dr. Shraddha Srivastava, Dr. Priyanka Sharma, Dr. Soniya Verma	17-05-2024	Published
20.	System and method for sign language recognition	CS	Ms. Vidhi , Ms. Vishakha Rana , Ms. Sanskriti Bajpai , Mr.Raj Kumar, Mr. Harsh Khatter	17-05-2024	Published
21.	Air pollution forecasting in NCR	CS	Ms. Ankita Kushwaha, Mr. Avi Chaudhary, Ms. Avika Tyagi, Mr. Abhishek Goyal, Dr. Gaurav Dubey	17-05-2024	Published
22.	Automated heartbeat sensing device with integrated alert message system	IT	KIET, Ms. Bidyashree Nayak, Ms. Nivedita Rai, Mr. Saksham Tandon, Ms. Samriddhi Jaiswal , Mr.Puneeta Singh, Mr.Sartaj Ahmad	17-05-2024	Published
23.	System and method for on-demand home services	CS	KIET, Mr.Mayank Gupta, Mr.Manvendra Kumar , Mr.Naman Nagaria, Mr.Sreesh Gaur	17-05-2024	Published
24.	Fastag integrated smart parking management system (FSPMS)	IT	KIET, Mr.Anuj Gupta , Mr.Analp Pathak, Mr.Dinesh Kumar , Dr. Sartaj Ahmad , Mr.Mayank Tyagi	17-05-2024	Published
25.	Smart method for non-fungible token thereof	CS	KIET, Mr. Harsh Khatter, Mr. Avaneesh Singh,	17-05-2024	Published

			Mr.Nishant Varshney, Mr.Harsh Kumar, Mr.Abhishek Goyal		
26.	Real-time system for telemedicine based on IOT & AI VIA wearable sensors	ECE	Dr. Chirag Arora	17-05-2024	Published
27.	System and method to analyze and visualize the codeforces progress using codeforces API	CS	Ms. Priyanshi, Mr. Priyanshu Raj, Mr. Sagar Srivastava , Mr. Sreesh Gaur , Mr. Harsh Khatter	24-05-2024	Published
28.	IOT enabled audio player integrated printer	CSE	Dr. Dilkeshwar Pandey, Dr. Sanjiv Sharma, Dr. Amit Kumar Gupta	24-05-2024	Registration of Design
29.	Mobile charger with holder	KSOP	Dr. Kiran Sharma	24-05-2024	Registration of Design
30.	Laboratory Apparatus SET	KSOP	Prof. (Dr.) N. G. Raghavendra Rao, , Dr. Monika Kaurav, Mr. Ayush Asthana, Ms. Anshika Malik	17-05-2024	Registration of Design
31.	Device for healthcare decision support	CSIT	Dr. Ankur Garg	03-05-2024	Registration of Design
32.	Capsule Filling Machine	KSOP	Prof. (Dr.) N. G. Raghavendra Rao	10-05-2024	Registration of Design

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.	Dr. Deepti Katiyar	Associate Professor	KSOP	Recent Advances in Electrochemical Biosensors Targeting Stress Makers	1.8	11,000	SCI
2.	Dr. Deepti Katiyar	Associate Professor	KSOP	Electrochemical Sensors for Detection of Phytomolecules: A mechanistic Approach" in the Journal	1.8	11,000	SCI
3.	Mr. Vipin Deval	Assistant Professor	CSE	Mobile Smart Contracts: Exploring Scalability Challenges and Consensus Mechanisms	3.9	21,000	SCIE
4.	Ms. Shipra Singhal	Assistant Professor	KSOP	Recent Advances and Structures Activity Relationship Studies of DPP-4 Inhibitors as Anti-Diabetic Agents	5.1	15,000	SCIE

Highlights of the Published Journal Articles

1.   **Katiyar D, Manish. Recent Advances in Electrochemical Biosensors Targeting Stress Markers. Comb Chem High Throughput Screen. 2024 Jan 25. DOI: 10.2174/0113862073278547231210170007. Epub ahead of print. PMID: 38279751.**

Introduction: When the body experiences a change in its internal environment due to factors such as mood (euphoria, stress) and illness, it releases biomarkers in large quantities. These biomarkers are used for detecting a disease at its early stages. This involves the detection of insufficient quantities of biocomponents, which can be done by using nanomaterials, conventional materials, and biotechnology; thus, scientists can increase the sensitivity of electrochemical sensors. According to studies conducted in this area, electrochemical sensors have shown promise as a diagnostic tool due to their ability to identify and pinpoint illness biomarkers. The present review article was compiled to gather the latest information on electrochemical biosensors targeting stress markers.
Materials and methods: The authors searched scholarly databases like ScienceDirect, Pubmed, Medline, and Scopus for information on electrochemical biosensors targeting stress markers.
Results: In this article, we looked at the recent developments in electrochemical sensors for stress monitoring. Because of advances in nanomaterial and biomolecule processes, electrochemical biosensors have been developed with the sensitivity to detect several biomarkers in real-time in therapeutically relevant materials.
Conclusion: This biomarker sensor strategy can analyze various biofluids (sweat, plasma, urine, and saliva).

2.   **Katiyar D, Manish, Saxena Pal R, Bansal P, Kumar A, Prakash S. Electrochemical Sensors for Detection of Phytomolecules: A Mechanistic Approach. Comb Chem High Throughput Screen. 2024 Jan 25.**
DOI: 10.2174/0113862073282883231218145941.
**Epub ahead of print. PMID: 38279749.**

High demand and ongoing technological advancements have created a market for sensors that is both varied and rapidly evolving. Bioactive compounds are separated systematically to conduct an in-depth investigation, allowing for the profiling or fingerprinting of different Plantae kingdoms. The profiling field is significant in elucidating the complex interplay of plant traits, attributes, and environmental factors. Flexible technology advancements have enabled the creation of highly sensitive sensors for the non-destructive detection of molecules. Additionally, very specialized integrated systems that will allow multiplexed detection by integrating many hybrid approaches have been developed, but these systems are highly laborious and expensive. Electrochemical sensors, on the other hand, are a viable option because of their ability to accomplish exact compound detection via efficient signal transduction. However, this has not been investigated because of some obstacles to learning minimum metabolites' fundamentals and nonredox properties. This article reviews the electrochemical basis of plants, contrasting it with more conventional techniques and offering both positive and negative perspectives on the topic. Because few studies have been devoted to the concept of merging the domains, we've expanded the scope of this work by including pertinent non-phytochemical reports for better report comparison.

3.   **V. Deval *et al.*, "Mobile Smart Contracts: Exploring Scalability Challenges and Consensus Mechanisms," in *IEEE Access*, vol. 12, pp. 34265-34288, 2024,**
DOI: 10.1109/ACCESS.2024.3371901.
Mobile smart contracts (MSCs) are essential to facilitate quick, safe, and decentralized transactions on mobile blockchain networks. Scalable blockchain solutions facilitate the establishment of a mobile blockchain ecosystem characterized by enhanced resilience and adaptability. This encourages an increase in the number of users and, thus, spreads the adoption of blockchain technology in the mobile domain. With the inception of blockchain technology, a wide range of applications use smart contracts due to their high customizability. However, problems with scalability and resource-intensive consensus procedures prevent their general use. Therefore, this work seeks to identify and analyze these constraints by conducting a systematic survey using Kitchenham's guidelines for available scalable blockchains and consensus methods. Out of a preliminary pool of 2,073 publications, our

study, which consists of 25 selected studies, identifies 12 consensus mechanisms and 13 scalable blockchain systems. Our investigation shows that, despite the wide range of techniques, no blockchain solution provides the scalability and lightweight operating requirements to implement smart contracts on mobile devices. This realization draws attention to a significant gap in academic and industry-driven blockchain research that may have implications for creating MSCs. Our findings encourage academics to explore scalable and energy-efficient blockchain technology, targeting creating more approachable smart contracts designed with mobile devices in mind.
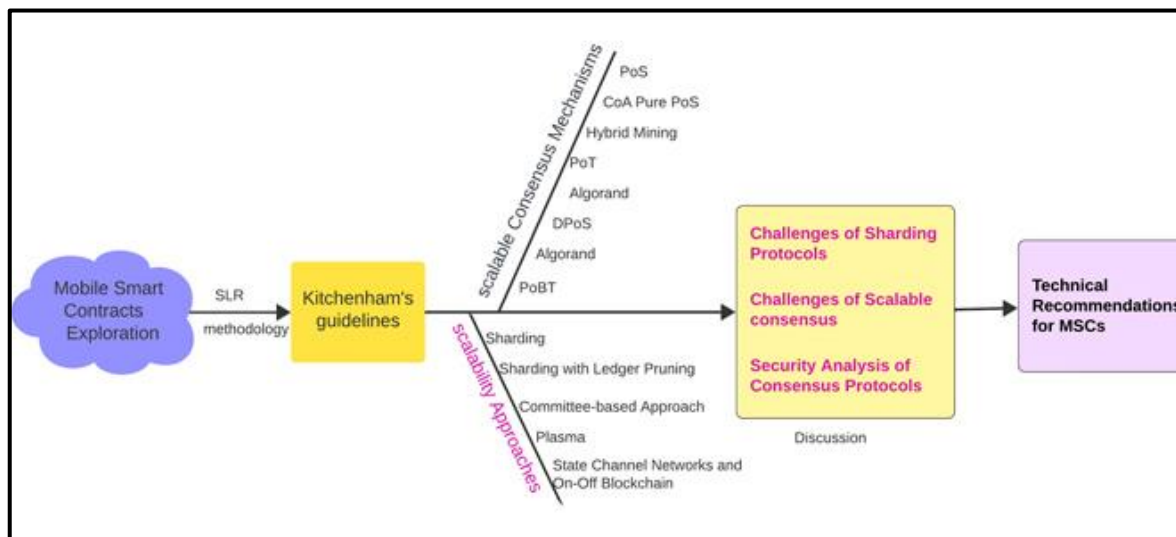
4.   Shipra Singhal, Vaishali Manikrao Patil, Saroj Verma, Neeraj Masand, Recent advances and structure-activity relationship studies of DPP-4 inhibitors as anti-diabetic agents, Bioorganic Chemistry, Volume 146, 2024,107277, ISSN 0045-2068, https://doi.org/10.1016/j.bioorg.2024.107277

Diabetes mellitus (DM) is one of the largest public health problems worldwide and in the last decades various therapeutic targets have been investigated. For the treatment of type-2 DM (T2DM), dipeptidyl peptidase-4 (DPP-4) is one of the well reported target and has established safety in terms of cardiovascular complexicity. Preclinical and clinical studies using DPP-4 inhibitors have demonstrated its safety and effectiveness and have lesser risk of associated hypoglycaemic effect making it suitable for elderly patients. FDA has approved a number of structurally diverse DPP-4 inhibitors for clinical use. The present manuscript aims to focus on the well reported hybrid and non-hybrid analogues and their structural activity relationship (SAR) studies. It aims to provide structural insights for this class of compounds pertaining to favourable applicability of selective DPP-4 inhibitors in the treatment of T2DM.
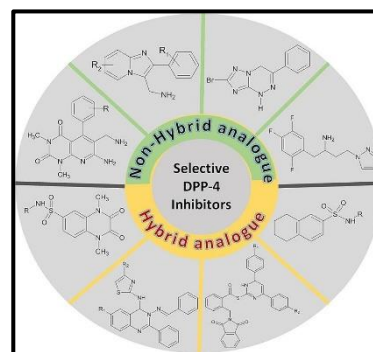
Reimbursement of Conference Registration Fee

S. No	Name of Faculty	Designation	Dept.	Name of Conference	Title of Paper	Benefits/ Incentives	Published By
1.	Kanika Dwivedi	Associate Professor	CSE	2024 2nd International Conference on Disruptive Technologies (ICDT)	An Automatic Robust Deep Learning and Feature Fusion-based Classification Method for Early		IEEE

					Diagnosis of Oral Cancer Using Lip and Tongue Images."		
2.	Pratishank Shukla	Student (IV)	IT	International Conference on Technological Advancements in Computational Sciences (ICTACS-2023)	Financial Fraud Detection and Comparison using different Machine Learning Technique		IEEE
3.	Hasnain Abbas Zaidi	Student (M.Tech,)	CSE	2nd International Conference on Disruptive Technologies (ICDT-2024)	A Review of Machine Learning Models for Predicting Agile Methodology		IEEE
4.	Nikhil Tyagi	Student (M.Tech,)	CSE	2nd International Conference on Disruptive Technologies (ICDT-2024)	A Review of Machine Learning Algorithms for Predicting Heart Disease		IEEE
5.	Madhav Ojha	Student (IV)	IT	International Conference on Advancing in Computation, Communication and Information Technology (ICAlCClT-2023)	Blockchain-powered Secured Federated Learning for Privacy-Preserving Communication		IEEE
6.	Pushpendra Kumar	Assistant Professor	CSE	2024 2nd International Conference on Disruptive Technologies (ICDT)	Deep Learning for Weed Detection: Exploring YOLO V8 Algorithm's Performance in Agricultural Environments		IEEE
7.	Tanushree Sanwal	Assistant Professor	KSOM	6th IEEE International Conference on Emerging Smart Computing & Informatics (IEEE ESCI - 2024)	An Investigation on the Level of Customer Satisfaction with E-Banking Services with a Special Focus on the Delhi-NCR Region		IEEE
8.	Pakhi Sharma	Student (M.Tech,)	CSE	International Conference on Contemporary Computing and Informatics (IC31-2023)	A Comprehensive Study of the Machine Learning with Federated Learning Approach for Predicting Heart Disease		IEEE
9.	Pakhi Sharma	Student (M.Tech,)	CSE	International Conference on Contemporary Computing and Informatics (IC3I-2023)	An Effective FL-CNN Based Data Securing Model for Heart Disease Prediction		IEEE

10.	Mitu Ranjan	Student (M.Tech,)	CSE	International Conference on Artificial Intelligence, Blockchain, Computing and Security (ICABCS-2023)	Modeling of Progressive Alzheimer's Disease using Machine Learning Algorithms	Taylor & Francis
11.	Manu Gupta	Associate Professor	CSIT	International Conference on Disruptive Technologies (ICDT-2024)	Real-time Video Surveillance using Pyramidal CNN	IEEE

Highlights of the Published Conference Papers

1.   K. Dwivedi, K. Patel, J. P. Pandey and P. Garg, "An Automatic Robust Deep Learning and Feature Fusion-based Classification Method for Early Diagnosis of Oral Cancer Using Lip and Tongue Images," *2024 2nd International Conference on Disruptive Technologies (ICDT)***, Greater Noida, India, 2024, pp. 391-395, DOI: 10.1109/ICDT61202.2024.10489266.**

Oral cancer is becoming a more challenging issue globally as it is 5 th most common cancer. Alcohol, betel nut and tobacco are responsible for more than 95% of oral cancer cases. Early diagnosis of oral cancer can improve survival prospects. Artificial intelligence is becoming more popular in medical diagnosis systems. This study aims to define the ability of AI models to analyze and identify early stages of oral cancer. Different deep-learning models were employed to develop an automated fusion-based network to recognize oral cancer. The proposed method is implemented on a publicly available dataset having tongue and lip images for the diagnosis of oral cancer. The data augmentation is applied in the dataset to avoid the problem of data unbalancing. The hyperparameters are optimally selected specifically for the considered dataset to provide higher accuracy and analyze the effectiveness of the proposed model. The evaluated performance of the proposed fusion-based model was compared with other state-of-the-art deep learning models which show that the proposed model outperforms all other models by achieving an overall accuracy of 94.62 %. The effectiveness of the proposed model can help in the medical diagnosis system for the detection and classification of oral cancer at an early stage.

2.   P. Shukla, M. Aggarwal, P. Jain, P. Khanna and M. K. Rana, "Financial Fraud Detection and Comparison Using Different Machine Learning Techniques," *2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS)***, Tashkent, Uzbekistan, 2023, pp. 1205-1210, doi: 10.1109/ICTACS59847.2023.10390165.**

More than ever before, fraudsters are actively targeting financial transactions. This research paper examines the effectiveness of various machine learning techniques in detecting and preventing financial fraud arising due to transactions. In this paper we have compared and analysed 6 different kinds of Machine Learning Techniques i.e. (Naive Bayes, Neural Network, Decision Tree, Support Vector Machine, Logistic Regression, Random Forest) with Random Forest being the most suitable for predicting fraudulent transactions. The research also identifies patterns in fraud cases, as the timing of occurrences and the demographics targeted. The study concludes by suggesting future research directions, including exploring advanced ensemble learning methods, incorporating deep learning algorithms, addressing imbalanced datasets, implementing real-time fraud detection, and extending the research to other sectors such as health. Overall, this study helps in understanding of credit card fraud detection and provides valuable insights for future research.

3. **H. A. Zaidi and P. Jain, "A Review of Machine Learning Models for Predicting Agile Methodology,"** *2024 2nd International Conference on Disruptive Technologies (ICDT),* **Greater Noida, India, 2024, pp. 971-974, doi: 10.1109/ICDT61202.2024.10489437.**

Agile methodologies., particularly the Scrum framework, have emerged as integral tools for addressing complex challenges and delivering high value software products. This research delves into the intersection of agile methodologies and machine learning, proposing a predictive approach to forecast Scrum Agile adoption. As agile methodologies gain prominence across diverse sectors, the integration of predictive and prescriptive analytics emerges as a potent strategy for unraveling intricate interdependencies impacting agile project outcomes. This study follows the data science lifecycle, employing the scientific method to iteratively evaluate and enhance the predictive model for Scrum Agile adoption. Beginning with issue definition and data collection, the research progresses through stages of data preparation, exploration, and feature extraction. Leveraging machine learning techniques, predictive models are developed, tested, and assessed to provide insights into the likelihood of successful Scrum Agile adoption.

4. **N. Tyagi and P. Jain, "A Review of Machine Learning Algorithms for Predicting Heart Disease,"** *2024 2nd International Conference on Disruptive Technologies (ICDT),* **Greater Noida, India, 2024, pp. 961-965, DOI: 10.1109/ICDT61202.2024.10488917.**

One of the most common causes for death in modern society is heart disease. Clinical data analysis has significant challenges in predicting heart disease. It has been shown that predictions and judgments may be made from the massive amounts of data generated by the healthcare industry by using machine learning (ML). Algorithms based on machine learning have demonstrated remarkable efficacy in generating highly accurate findings, therefore delaying the beginning of heart disease in several people and mitigating its effects in those who are already afflicted. It has aided physicians and medical researchers world- wide in identifying patient patterns that have led to the early diagnosis of cardiac conditions. We have seen the use of ML approaches in a number of sectors in recent IoT advancements. Few studies have examined the use of ML to forecast cardiac illness. In this paper, we provide an innovative approach to enhancing the accuracy of heart disease prediction by utilizing machine learning approaches to identify critical features. For establishing the prediction model, several feature combinations and popular classification techniques are employed.

5. **M. Ojha, M. Aggrawal, A. Pandey and A. Awasthi, "Blockchain-Powered Secure Federated Learning for Privacy-Preserving Communication,"** *2023 International Conference on Advances in Computation, Communication and Information Technology (ICAICCIT),* **Faridabad, India, 2023, pp. 865-871, doi: 10.1109/ICAICCIT60255.2023.10465686.**

Nowadays, it's important for companies to make sure their employees are using the right apps. This is especially true when it comes to important business communication like trade secrets, referrals, and decision making. Keeping messages and files secure is a big job, and most communication platforms don't have the features needed to manage, track, and expand communication networks while still keeping data safe. This makes it easy for industries to be exposed to risks across different sectors. People and companies have a lot of worries about data security and privacy when using Instant Messaging apps. Non-reaction in communications is important because it shows that people understand what's going on, but it also helps build trust and solve trust issues. This research paper's main goal is to create a chat app that provides enterprise-level security for messaging. In this research paper the latest technologies like blockchain, which works on a decentralized model. The goal is to break down the barriers of traditional messaging apps.

6. P. Kumar and U. Misra, "Deep Learning for Weed Detection: Exploring YOLO V8 Algorithm's Performance in Agricultural Environments," *2024 2nd International Conference on Disruptive Technologies (ICDT),* **Greater Noida, India, 2024, pp. 255-258, doi: 10.1109/ICDT61202.2024.10489628.**

The YOLO V8 algorithm is a state-of-the-art deep one-stage object detection algorithm. This study assesses its effectiveness in weed detection in agricultural environments. The algorithm's performance in identifying and localizing weed species within crop fields was evaluated using a diverse dataset of crops and weed species. The YOLO V8 algorithm achieved an accuracy of 86% in weed identification in the real-time agricultural environment, with minimal false positives. As it is a single-shot object detection algorithm it exhibits excellent processing speeds, making it suitable for practical field applications. The findings demonstrate the potential of deep learning techniques for robust and real-time weed detection in agricultural settings. The weed management practices can be benefited from the help of machine vision and deep learning techniques and contribute towards sustainable development.

7. T. Sanwal, A. Sharma, S. Avasthi, M. Tyagi, R. Sharma and S. Tyagi, "An Investigation on the level of Customer Satisfaction with E-Banking Services with a special focus on the Delhi - NCR Region," *2024 International Conference on Emerging Smart Computing and Informatics (ESCI),* **Pune, India, 2024, pp. 1-6, DOI: 10.1109/ESCI59607.2024.10497337.**

The expansion of electronic banking (E-banking) in India has been facilitated by the government and the Reserve Bank of India, with the IT Act of 2000 establishing the legal validity of electronic transactions. Customer satisfaction with E-banking is influenced by factors such as service quality, performance, security/privacy, and website design. The criteria with the highest correlation with customer satisfaction include performance, device accessibility, and rewards. The objective of this study was to investigate the correlation between demographic factors and customer happiness, assess the level of risk experienced by customers, and identify elements that promote increased usage of E-banking services. The findings showed that mobile banking was the preferred method for conducting electronic transactions for 38% of participants, followed by ATMs (34%), internet banking (28%), and debit/credit cards (5%). The main motivations for using E-banking services were to see transaction status (43%), save time (28%), pay utility bills (21 %), and for security considerations (8%). PNB Bank, ICICI Bank, SBI Bank, HDFC Bank, and Federal Bank were the preferred banks for E-banking services. A survey revealed that 47% of respondents agreed with the security of E-banking transactions, while 53 % either had a neutral stance or disagreed. The majority of respondents (82%) expressed satisfaction with online banking, while a minority (18%) reported dissatisfaction. Overall, the study highlights the growing popularity and satisfaction with E-banking services in India.

8. P. Sharma and S. Sharma, "A Comprehensive Study Of The Machine Learning With Federated Learning Approach For Predicting Heart Disease," *2023 6th International Conference on Contemporary Computing and Informatics (IC3I),* **Gautam Buddha Nagar, India, 2023, pp. 1867-1873, doi: 10.1109/IC3I59117.2023.10397716.**

Heart disease is a leading cause of mortality worldwide, resulting in millions of deaths annually. As individuals age and their physical condition deteriorates, the risk of developing heart disease increases. To mitigate this risk, predictive models leveraging machine learning and artificial intelligence have emerged as valuable tools for early diagnosis and treatment. In this review paper, we introduce the Google-pioneered concept of federated learning as a means to address concerns about data safety in the context of heart disease prediction. Federated learning, also known as collaborative learning, employs a technique wherein an algorithm is trained through multiple independent sessions, each utilizing its own dataset.

This paper aims to provide a comprehensive investigation of recent machine learning approaches and databases employed in predicting the occurrence of cardiovascular disease.

9. **P. Sharma and S. Sharma, "An Effective FL-CNN Based Data Securing Model for Heart Disease Prediction,"** *2023 6th International Conference on Contemporary Computing and Informatics (IC3I)***, Gautam Buddha Nagar, India, 2023, pp. 1862-1866, DOI: 10.1109/IC3I59117.2023.10397649.**

Cardiovascular disease is the leading cause of death worldwide, according to the WHO. Coronary heart disease is most dangerous. 2015 saw 360,000 US heart attack deaths. Effective heart disease treatment prevents global deaths. An updated FL-CNN model improved cardiac disease diagnosis and prognosis for doctors and patients. Hospitals cannot disclose patient data for security and privacy reasons. Thus, centralizing data is hard. Federated Learning can train machine learning and deep learning models using massive volumes of distributed data. On the UCI Cleveland dataset, CNN with Federated Learning achieves 94.99% accuracy, while CNN with centralized learning achieves 97% accuracy.

10. **F. Abuhantash, A. A. Shehhi, L. Hadjileontiadis and M. L. Seghier, "Effect of Comorbidities Features in Machine Learning Models for Survival Analysis to Predict Prodromal Alzheimer's Disease,"** *2023 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)***, Sydney, Australia, 2023, pp. 1-4, DOI: 10.1109/EMBC40787.2023.10341171.**

Alzheimer's Disease (AD) is the most common form of dementia, specifically a progressive degenerative disorder affecting 47 million people worldwide and is only expected to grow in the elderly population. The detection of AD in its early stages is crucial to allow early intervention aiding in the prevention or slowing down of the disease. The effect of using comorbidity features in machine learning models to predict the time until a patient develops a prodrome was observed. In this study, we used Alzheimer's Disease Neuroimaging Initiative (ADNI) high-dimensional clinical data to compare the performance of six machine learning algorithms for survival analysis, combined with six feature selection methods trained on two settings: with and without comorbidities features. Our ridge model combined with permutation feature selection achieves maximum performance of 0.90 when using comorbidity features with the concordance index as a performance indicator. This demonstrated that incorporating comorbidities into the feature set enhances the performance of survival analysis for Alzheimer's disease. There is potential to identify risk factors (coronary artery disease) from comorbidities which could guide preventative care based on medical history.

11. **M. Sharma, S. K. Singh and S. Singhal, "Real Time Video Surveillance Using Pyramidal CNN,"** *2024 2nd International Conference on Disruptive Technologies (ICDT)***, Greater Noida, India, 2024, pp. 148-152, DOI: 10.1109/ICDT61202.2024.10489826.**

In this research paper, we present a detailed view of the two convolutional neural network (CNN) architectures, namely, traditional CNN and Pyramidal CNN, for their effectiveness in video surveillance applications. The goal of this paper is to evaluate and analyse the performance of these two deep learning architectures in terms of speed and accuracy when applied to video surveillance tasks. Our results indicate that the Pyramidal CNN architecture outperforms the traditional CNN model regarding speed and accuracy. The Pyramidal CNN exhibits superior object detection and recognition capabilities, achieving faster processing times while maintaining high precision levels. This finding holds significant implications for real-time. Video surveillance applications, where rapid and accurate video data analysis is essential.

Innovation Spotlights of the Month

Human Organ Chips

Microfluidic devices lined with living human cells for drug development, disease modeling, and personalized medicine.

A multidisciplinary team of Wyss Institute researchers and collaborators have adapted computer microchip manufacturing methods to create "Organs-on-Chips" (Organ Chips): microfluidic culture devices that recapitulate the complex structures and functions of living human organs.

These microdevices are composed of a clear flexible polymer about the size of a USB memory stick that contains hollow microfluidic channels lined with living human organ cells and human blood vessel cells. These living, three-dimensional cross-sections of human organs provide a window into their inner workings and the effects that drugs can have on them, without involving humans or animals.
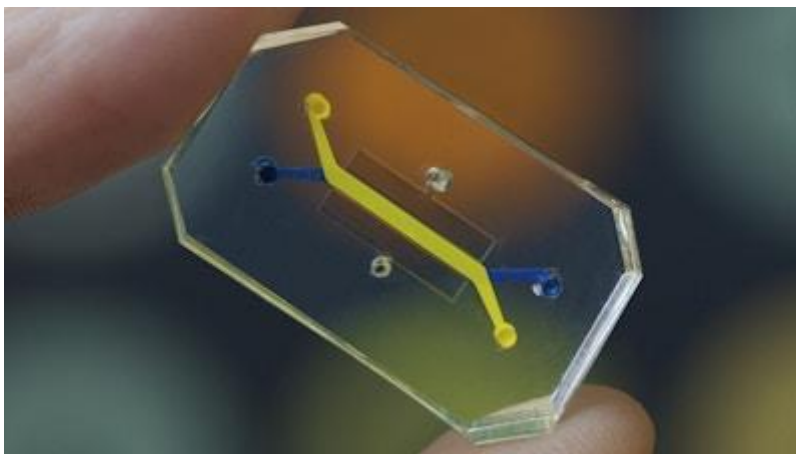
Human Organ Chip

Source: https://wyss.harvard.edu/

India Ranks 63rd in the Global Energy Transition Index

The **World Economic Forum (WEF)** just released the Global Energy Transition Index on June 19, 2024. It shows that the global energy transition scene has changed in big ways. After falling to 67th place, India moved up to 63rd place out of 120 countries, which is a big jump. Sweden stayed at the top of the Index, showing that it has been making steady progress in the energy field.

India's Progress in Energy Transition
India was praised by the WEF for taking the initiative to promote sustainable energy sources, especially solar energy. The country's progress in energy security, fairness, and long-term use shows that it is becoming an important player in global energy changes. Notably, 42% of India's total energy production potential now comes from renewable sources, such as biomass. Other countries are following the lead of the United States by investing in green hydrogen and making more electric vehicles.

What is the Global Energy Transition Index?
The Index, which was made by the WEF and Accenture working together, is a way to compare how ready and how well countries are doing at switching to safe, long-lasting, and fair energy systems. A lot of things are looked at, like government regulations, energy security, sustainability efforts, and lowering carbon emissions. The goal of the Index is to keep track of how far the world has come in using less fossil fuels and making energy use more efficient.

Global Performance

In 2024, Sweden, Denmark, Finland, Switzerland, and France lead the better rankings. This is because they have strong energy policies and are committed to being environmentally friendly. With rankings of 20th and 63rd, China and India stand out among non-European countries. The study stresses that most of the countries that were looked at have made progress in their energy transition plans, even though they have faced economic and geopolitical problems.

Source: https://www.gktoday.in/india-ranks-63rd-in-the-global-energy-transition-index/

Efficient Indoor Solar Cells With Mirror Like Black Surface

Thinner electrodes and increased layer thickness enable significant technological advancements.

Panasonic's hydrogenated amorphous silicon (a-Si:H) solar cells, known as Amorton, have long powered various indoor and outdoor applications, including IoT devices, watches, sensor nodes, asset trackers, and remote controls. These cells efficiently harvests energy even in low-light and artificial-light conditions. The company introduced series: AMG-1401C and AMG-1701C. These new models feature a black-reflective surface and significantly enhanced efficiency, achieving a 20% boost. This improvement stems from an optimized production process that expands the active area compared to previous models. As a result, the AMG-series is among the most efficient indoor amorphous solar cells available.

The key specifications include:

- Both models are built on glass substrates
- Thickness: 1.1mm
- Energy generation: approximately 8uW/cm² at 200 lux per active area
- External dimensions are slightly larger than the active area for space and material optimization
- Dimensions: 41.4mm x 26.1mm
- Maximum energy generation: 77.8uW at 200 lux
- Cell voltage: 2.2V

The external dimensions are slightly larger than the active area to optimize space and material usage. These solar cells are designed for a variety of energy harvesting applications, ensuring efficient performance. Additionally, they are compatible with a wide range of power management ICs available on the market, making them versatile and adaptable for different systems.

"We are thrilled to launch the new indoor Amorton solar cell series, marking a significant advancement in amorphous silicon solar cell technology," says Robert Spiegler, Lead Product Manager Solution Business at Panasonic Industry. "Our extensive R&D and production expertise has enabled us to develop solar cells that excel in both appearance and performance. Additionally, we can customize solar cells for small electronic devices according to customer requirements, including transparent surfaces for applications involving displays."

For more information visit: https://industry.panasonic.eu/products/energy-building/amorphous-solar-cells/amorton-indoor-environment

A Transceiver Boosts 5G Coverage In Blocked Areas

The breakthrough in 5G technology with a new transceiver expands network coverage to areas previously blocked by obstacles.
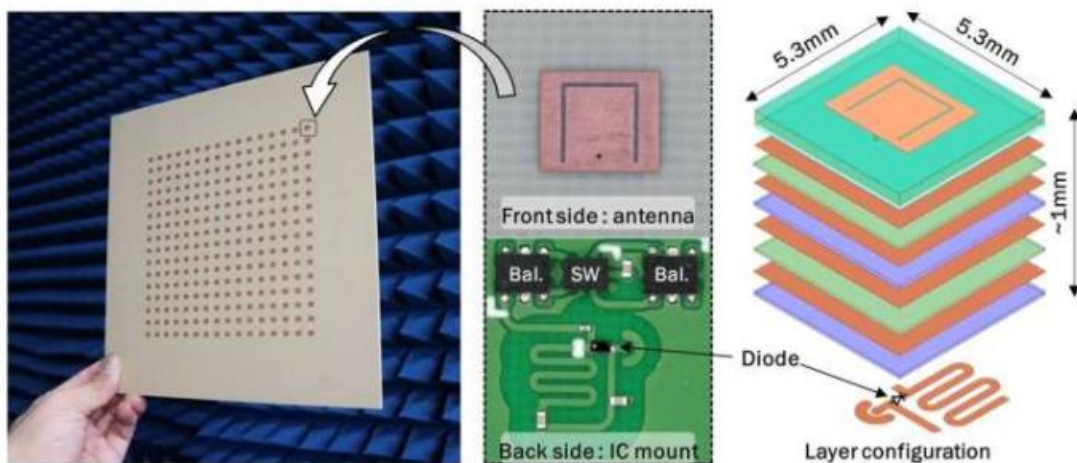
The proposed transceiver design enables high power conversion efficiency and conversion gain, enhancing 5G network coverage even in areas with link blockage. Credit: 2024 IEEE MTT-S International Microwave Symposium

Scientists at Tokyo Tech have developed a new 256-element transceiver array for non-line-of-sight 5G communication, which is wirelessly powered and boasts high efficiency in power transmission and conversion.

The design could significantly expand 5G network coverage to areas with link blockage, thereby enhancing flexibility and the scope of coverage. This advancement may lead to more widespread access to high-speed, low-latency communications.

Millimeter wave 5G communication utilizes extremely high-frequency radio signals (24 to 100 GHz), offering promising advancements in speed, latency, and network capacity for next-generation wireless communications.

Nevertheless, today's 5G networks encounter significant challenges, including low signal-to-noise ratios (SNR), essential for quality communication, and link blockages that occur when obstacles like buildings interrupt the signal path between transmitter and receiver.

Beamforming, a crucial method for long-range communication using millimeter waves, improves SNR by directing radio signals into a concentrated beam toward a specific direction, similar to a flashlight focusing light on a target. However, this technique is traditionally constrained to line-of-sight communications and can be impaired by obstacles.

Moreover, materials like concrete and modern glass can severely diminish signal strength, highlighting the critical need for a non-line-of-sight (NLoS) relay system to bolster 5G coverage, particularly indoors.

To tackle these challenges, the team have developed a new wirelessly powered relay transceiver for 28 GHz millimeter-wave 5G communication. The proposed transceiver features 256 rectifier arrays equipped for 24 GHz wireless power transfer (WPT). These arrays are composed of discrete integrated circuits (ICs), including gallium arsenide diodes, and baluns that connect balanced and unbalanced (bal–un) signal lines, double-pole double-throw (DPDT) switches, and digital ICs. Explaining the motivation behind their study, Associate Professor Atsushi Shirane from the Laboratory for Future Interdisciplinary Research of Science and Technology at Tokyo Institute of Technology(Tokyo Tech) says, "Previously, for NLoS communication, two types of 5G relays have been explored: an active type and a wireless-powered type. While the active relay can maintain a good SNR even with few rectifier arrays, it has high power consumption.

Reference: Michihiro Ide et al, A 256-Element Phased-Array Relay Transceiver for 5G Network Using 24-GHz Wireless Power Transfer With Discrete ICs, *IEEE Microwave and Wireless Technology Letters* (2024). DOI: 10.1109/LMWT.2024.3395300

Newspaper: Monthly Technical Spotlights

With 3D-printed rocket engine, Isro adds another feather to its cap

TIMES NEWS NETWORK

Bengaluru: Isro has added another feather to its cap with the successful hot testing of a liquid rocket engine manufactured using additive manufacturing—or 3D printing — technology on May 9, the space agency said Friday.

The engine, designated as PS4, is used in the upper stage of Isro's workhorse rocket, Polar Satellite Launch Vehicle.

Isro redesigned the conventionally manufactured PS4 engine to make it compatible with additive manufacturing techniques. It said this innovative approach, known as Design for Additive Manufacturing, has yielded remarkable advantages.

"The Laser Powder Bed Fusion technique employed
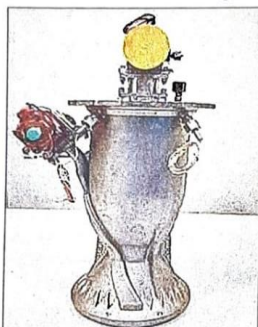
The engine, designated as PS4, is used in the upper stage of Isro's workhorse rocket, the Polar Satellite Launch Vehicle.

in the manufacturing process reduced the number of engine components from 14 to a single piece, eliminating 19 weld joints. This streamlined design not only significantly reduced raw material usage per engine from 565kg to a mere 13.7kg of metal powder but also cut overall production time by 60%," Isro said.

The PS4 engine, which uses a bipropellant combination of nitrogen tetroxide as the oxidizer and monomethyl hydrazine as the fuel, was developed by Isro's Liquid Propulsion Systems Centre. The manufacturing of the additively manufactured engine was carried out by the Indian industry partner, Wipro 3D, while the hot testing was conducted at Isro's Propulsion Complex in Mahendragiri.

"Prior to the successful 665-second hot test, Isro conducted a comprehensive development programme that included detailed flow and thermal modelling, structural simulations, cold flow characterization of the proto hardware, and four successful developmental hot tests of the integrated engine for a cumulative duration of 74 seconds. These rigorous tests validated the engine's performance parameters," ISRO said.

The successful hot-testing of the 3D-printed PS4 helps leverage additive manufacturing technology for rocket engines in the future, said Isro. "This paves the way for the induction of the additively manufactured PS4 engine into the regular PSLV programme, ushering in a new era of advanced manufacturing techniques for India's space endeavours," it added.

After SaaS, Freshworks founder to ride AI wave

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Chennai: Freshworks founder Girish Mathrubootham is mindful of soon touching his 50s. So is he of the disruptions posed by AI-based applications to the software business. But he doesn't mind losing the title and money to achieve what he calls the 'real growth'.

Girish equated his decision to step down to quitting Zoho ManageEngine in 2010, as he and company chief executive Dennis Woodside spoke to **TOI** at Freshworks' office in Chennai on Thursday.

G, as he's fondly called, wanted to ride the opportunity in the software as a service (SaaS) wave and took the leap to startup. "I could see SaaS adoption growing." He added, "I think the moment of time that we are in right now (at) the beginning of the AI wave. It's a great opportunity to focus on product and make sure that FreshWorks as a company rides this wave really well."

He identified three changes AI brings to enterprise software — workflow automation, the use of co-pilot and data & insights for decision making. "Whether we like it or not, it is coming," Girish said, referring to workflow automation in enterprise software.

"These are a broad guiding framework on where we can focus. As we go deeper and as AI capabilities with foundation models get deeper, we'll be able to deliver more and more value," the founder said. He aims to build AI-based solutions in the product suite wherever possible.

The company has rolled out customer support automation, and another tool which summarises meetings, emails and articles. A data analytics solution is under development.

Amid broad industry concerns about monetising AI offerings, CEO Dennis said the company has started charging AI offerings and seeing traction, though it is still in its nascency.

> 66 I think the moment of time that we are in right now — the beginning of the AI wave, it's a great opportunity to focus on product and make sure that FreshWorks as a company rides this wave really well
>
> — **Girish Mathrubootham | Founder & executive chairman, Freshworks**

Customer support automation handles large amounts of queries and are paid per resolution basis, cutting costs for the company. "There's real value back to the company because they avoid that cost."

"We're monetising two of the three areas today, it's still very early. Customers have to get used to working in the load. They must see the value they have to see the business case, but we're starting to see good traction," he said.

12   **TIMES NATION**   THE TIMES OF

Amid Global Interest And Concerns Over Eco Impact, India Seeks Licence To Explore Minerals In Indian Ocean

India in underwater race to power your car

U.Tejonmayam@timesgroup.com

In the early 2000s, Indian researchers began looking for evidence of mineral deposits such as gold, silver, cobalt and manganese along the Carlsberg Ridge, a tectonic plate boundary in the Indian Ocean between India and Africa. As they did not have underwater vehicles, they could not precisely pinpoint the location of these minerals on the ocean floor. Hiring the vehicles was also a challenge as the region was infested with pirates. Ocean studies, however, confirmed the region was rich in several valuable minerals.

More than two decades years later, India has applied to the International Seabed Authority (ISA), a UN body, for a licence to explore the Carlsberg Ridge and Afanasy-Nikitin Seamount (ANS) — two regions at two extremes of the Indian Ocean — for minerals such as cobalt and manganese used to make batteries for electric vehicles and solar panels.

The application was made amid growing interest from neighbouring countries to explore mineral resources in the Indian Ocean. "We know China and other countries are coming to see the regions. So, for us, it is not only for mineral resources but is also strategically important," says M Ravichandran, secretary, ministry of earth sciences.

India is licensed to explore two regions in the Indian Ocean. The first is to explore polymetallic nodules in the central Indian Ocean, about 6000km from the Indian coast, at a depth of 6km. It was signed on March 25, 2002, and will expire on March 24, 2027. The second is for polymetallic sulphides at the Rodriguez Triple Junction in the southern Indian Ocean where three tectonic plates meet near Mauritius. This was signed on September 26, 2016, and will expire on September 25, 2031.

National Institute of Oceanography (NIO) director Sunil Kumar Singh says of the 71million sqkm Indian ocean region, they have mapped three lakh sqkm since the 1980s. The surveys, which have been submitted to the ISA, includes a 1.5lakh sqkm area with polymetallic nodules or manganese nodules, which are potato-shaped minerals lying on the seabed primarily containing manganese, nickel, cobalt, copper and iron hydroxide.

"In the 1980s, we recruited scientists to study polymetallic nodules in the Indian Ocean with the hope that one day there will be technology to explore these regions," he says.

Every exploration begins with ship-based studies, says Thamban Meloth, director of the National Centre for Polar and Ocean Research. "Preliminary sampling is then done followed by autonomous underwater vehicle and remotely operated vehicle studies. A parallel study

INTO THE DEEP BLUE Of tectonic boundaries, underwater volcanoes and a world rich in cobalt, copper and nickel

① WHAT IS AFANASY-NIKITIN SEAMOUNT?
› The 400km long and 150km wide Afanasy-Nikitin Seamount (ANS) region is located southeast of Sri Lanka in the central Indian Basin
› There are volcanic seamounts here at depths of 500m to 2000m that formed around 80 million years ago when dinosaurs lived
› The ANS seamount, which is around 3,000km from the Indian coast and named after a 15th century Russian merchant who documented his travel to India, is rich in cobalt, copper, manganese and nickel
› Cobalt-rich crusts form when metal ions in the water react with oxygen to form oxides and get deposited on the slopy top portion of the seamount over millions of years
› NIO researchers found significantly high concentrations of cobalt in the 800m-2000m water depth where oxygen levels are significantly low. The ANS has been claimed by Sri Lanka as its territory under a different set of rules

② WHAT IS CARLSBERG RIDGE?
› Northwestern limb of Indian Ocean Ridge system, formed 30 million years ago, and which defines tectonic plate boundary where Indian and Somalian plates are moving away from each other
› At 1,800m to 3,600m depth, it is seismically active and has recorded major earthquakes
› Region has magma flowing out of earth's interior or oceanic crust
› Seawater, which falls through cracks of ocean rocks, interacts with magma and is spewed out through hydrothermal vents
› The plumes have sulphides rich in minerals such as zinc, copper, manganese, cobalt, gold, silver as well as rare earth and platinum group elements which then get deposited on the seafloor
› NIO researchers have recorded chemical and temperature signatures in this region that could help identify the probable location of vents

WHAT ARE THE MINERALS USED FOR?
› Experts say minerals such as cobalt, nickel, copper and manganese can be used to produce renewable energy such as solar and wind power, electric vehicles and EV battery technology to help cut greenhouse gases and mitigate climate change

HOW IS THE EXPLORATION DONE?
› Oceanographers start with preliminary studies using ship-based instruments such as multibeam sonar and magnetometers to map the seafloor and record the chemical and other signatures in the water
› Samples of rocks, potential minerals are collected using grabs, coring and dredging
› A parallel study is undertaken to understand the biological life existing in the dark depths of the ocean, and the environmental impact of any mining activity in the future

Total exploration contracts | 31   **No of contractors/ countries involved in deep sea exploration | 22**

In the two regions being explored, Indian researchers have started test mining in an 18,000sqkm area in the Central Indian Ocean, which is part of the 75,000sqkm allotted for Indian exploration of polymetallic nodules. It involves developing and testing equipment for extracting and harvesting the minerals from the ocean without disturbing the environment. Chennai-based National Institute of Ocean Technology (NIOT) is developing an integrated mining system, which will include a 5m long crawler, crusher and a pumping system.

At present, India is largely dependent on imports for minerals such as cobalt from the UK, China and Norway. Deepsea exploration proponents say mining on land has reached a breaking point and is hit by environmental conflicts leading to low-quality production. With the demand for critical minerals surging, tapping high quality minerals from the largely unstudied oceans may be the last option. NIO researchers have identified 380million tonnes of polymetallic nodules including 1.5million tonnes of cobalt in the 75,000sqkm region in the central Indian Ocean. Experts say these minerals can be extracted from the oceans with minimal impact on the ecosystem. The ISA is working on a code that will regulate exploitation or mining of marine minerals in international waters. "We are trying to do an environmental impact assessment as we must know the impact on the ecosystem when we do test mining or if we do mining in the future," says Sunil Kumar Singh.

However, activists warn of massive damage to the marine ecosystem from mining in the oceans, which are already warming at a rapid pace, and say the world must focus on retrieval and recycling of minerals from existing products.

"The voice that says there will be minimal impact considers only humans as part of this ecosystem, but oceans have got a lot of diversity," says G Sundarrajan of Poovulagin Nanbargal, a Chennai-based activist group. "When they say international waters, it becomes nobody's waters. Who will oversee the environmental impact and who will oversee the damage caused to the ecosystem?"

NIOT CHENNAI IS DEVELOPING AN INTEGRATED MINING SYSTEM WHICH WILL INCLUDE A 5M LONG CRAWLER, CRUSHER AND A PUMPING SYSTEM

is also undertaken to understand the biological life in the ocean, and the environmental impact of any mining activity."

Patents Granted

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PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

Congratulations

On receiving grant certificate from Govt. of India
for Patent Titled "Automated Electric Ramp"

Date of Grant
30th April 2024
Application No. – 202011026117

Mr. Neeraj Kumar
Assistant Professor
ME

Mr. Rajeev Kumar
Assistant Professor
EEE

The legacy of KIET is its consistent acquisition of esteemed patents

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Congratulations

On receiving grant certificate from Govt. of India
for Patent Titled "Air Purifier"

Applicant Name:
KIET Group of Institutions,
CE Department

Date of Grant
29th April 2024
Application No. – 202011056702

The legacy of KIET is its consistent acquisition of esteemed patents

<u>KIET (R&D) Policies</u>

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

Ph.D. Guidance Policy

<u>General Guidelines for the Award of Best Ph.D. Supervisor/Co-Supervisor</u>

<u>Academic Session 2023-24</u>

A. Eligibility: Availability of Ph.D. thesis on "ShodhGanga" platform

B. Every year, the top five KIET PhD research supervisors/co-supervisors will be awarded based upon number of PhD students guided in that particular academic session, in addition to the CV Raman Award.

The marks claimed should be on the basis of quality of Ph.D. guided which may be verified on the basis of the following parameters:

(i)   Government University – 10 Marks

(ii)

        a. Private University coming in Top 100 NIRF Ranking - 09 Marks

        b. Private University coming in 101 – 200 NIRF Ranking - 08 Marks

        c. Private University -With SCI/SCOPUS papers and Ph.D. completion in less than 3 years (Except Course work) = 05 Marks

        d. Private University - Not following any guidelines/No evidence available as mentioned as mentioned in (C) those cases are not considered for any award.

S. No.	Parameter	Score	Categories
1	Outstanding Research Publication	25	a) Nature (British Multidisciplinary Scientific Journal) b) Science Academic Journal of the American Association c) Harvard Business Review (Management magazine published by Harvard Business Publishing, a wholly owned subsidiary of Harvard University)
2	Premier Research Publication	21	Paper must be published in SCI/SCIE/SSCI a) American Mathematical Society b) American Physical Society c) American Society for Civil Engineers (ASCE) d) American Society for Mechanical Engineers (ASME) e) American Society of Testing Materials (ASTM) f) Association for Computing Machinery (ACM) Transactions g) IEEE Transactions/Journals/Letters/Reviews h) IET Transactions/Journals/Letters/Reviews i) Institute of Civil Engineering Publishing, London j) Institute of Mechanical Engineering, London In addition to the above list the SCI/ SCIE/SSCI journals with impact factor>= 7 will be considered
3	Commendable Research Publication	15	Paper must be published in journal with an impact factor between 5 to 6.99 and indexed in SCI/ SCIE/ SSCI
4	Admirable Research Publication	11	Paper must be published in journal with an impact factor between 0.750 to 4.99 and indexed in SCI/ SCIE/ SSCI
5	Valuable Research Publication	8	Paper must be published in journal with an impact factor between 0.500 to 0.749 and indexed in SCI/ SCIE/ SSCI

6	Gratifying Research Publication	5	Paper must be published in journal with an impact factor between 0.250 to 0.499 and indexed in SCI/ SCIE/ SSCI
7	eSCI indexed Journal	2	Paper must be published in eSCI journal and available in Clarivate Analytics database

C. The faculty members will submit the filled nomination form along with the supporting documents which are as follows:

a. Ph.D. Guidance letter from university mentioning name of supervisor/ Co-supervisor.

b. Link of availability of thesis on "**ShodhGanga"** Platform.

c. Proof of Award of Scholar's Ph.D. Degree.

d. Proof of Course Work as per UGC Guidelines.

e. Reprints of Journal paper & proof of Impact factor and citation like SCI/SCI-E/SSCI/ESCI, published by Research Scholar during Ph.D. with supervisor/co-supervisor name.

**D. The process for filling the Nomination for the Award of Best Ph.D. Supervisor/ Co-Supervisor**

a. The nominations will be invited by HR from Professors, Associate Professors and AssistantProfessors.

b. **The applicant can claim only those research papers that have their names as supervisor/ co-supervisor with KIET Group of Institution, Delhi -NCR, Ghaziabad as affiliation.**

c. The Screening Committee **will be comprising** of Dean (R&D), Associate Deans (R&D) and Assistant Deans (R&D). The Screening Committee will check and **verify** all the credentials of nominated faculty members through an online process.

d. The list of shortlisted **applicants** will be submitted by the Screening Committee to the **Hon'ble** Director.

e. Dean (R&D) will submit the final list duly approved by Honorable Director to Head HRfor further action.

Various Research Labs in KIET

S. No.	Research Lab/Centre of Excellence	Department
1.	Centre of supercomputing equipped with NVIDIA DGX A100	CS (AI ML)
2.	Centre of Robotics and Mechatronics	ECE
3.	KIET NI LABVIEW Academy	ECE
4.	Bio-Medical Instrumentation MBS	ECE
5.	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
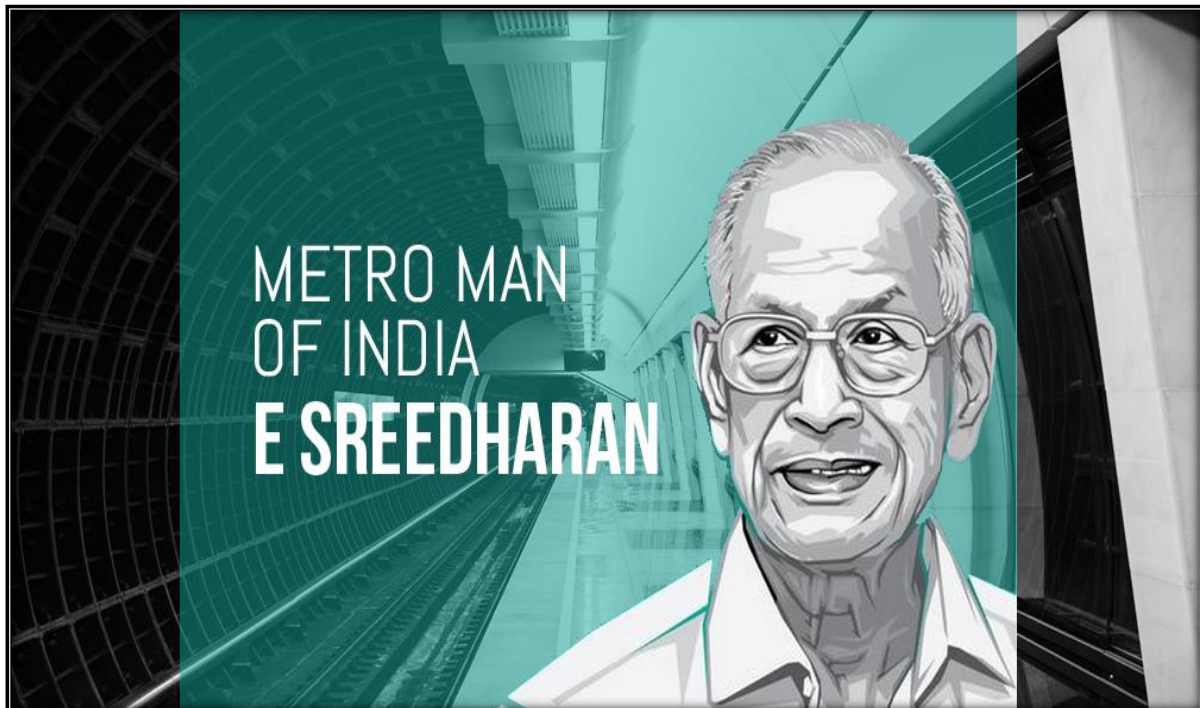
Elattuvalapil Sreedharan (born 12 June 1932) is an Indian engineer and politician from the Indian state of Kerala.

Following his engineering education, **Sreedharan** commenced his career as a Lecturer at Government Polytechnic. He later underwent an apprenticeship at Bombay Port Trust. Concurrently, he prepared for the **UPSC examination**, clearing it in 1953 and subsequently being appointed as a Probationary Assistant Engineer in the Southern Railways.

He is credited with changing the face of public transport in India with his leadership in building the **Konkan Railway and the Delhi Metro** while he served as the managing director of Delhi Metro Rail Corporation (DMRC) between 1995 and 2012

Known as the *Metro Man*, he was awarded the **Padma Shri** by the Government of India in 2001, the **Padma Vibhushan** in 2008, the **Chevalier de la Legion of Honour** in 2005 by the **Government of France** and was named one of Asia's Heroes by *Time* magazine in 2003.

Sreedharan was appointed by the former UN Secretary General Ban Ki-moon to serve on the United Nations's High Level Advisory Group on Sustainable Transport (HLAG-ST) for a period of three years in 2015.

He also worked as an advisor of Dhaka Metro authority which is called Dhaka Mass Transit Company Limited under the Railway Ministry of Bangladesh.

KIET Group of Institutions

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