April 2024

Vol No. 16

अनुसंधान

(KIET Research Magazine)

Shri K. Sharan
Chairman and CEO
Greentech Foundation
Vikaspuri, New Delhi – 110018
India

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

KIET – A GLANCE

Overview

KIET Group of Institutions (KIET) was established in 1998 at Ghaziabad (Delhi-NCR) with an annual intake of 180 students. It is an AICTE-approved Institution affiliated to Dr. A.P.J Abdul Kalam Technical University (AKTU), Lucknow (formerly UPTU). KIET offers UG & PG courses in four disciplines i.e., Engineering, MBA, MCA & Pharmacy. With the glorious legacy of 25 years, the Institute now has 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)

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Dr. Vibhav Kumar Sachan

Prof. & HoD (ECE)

Vice – Chairman

Dr. Vipin Kumar

Prof. & Addl. HoD (AS)

Member-Secretary

Dr. Brijesh Singh

Associate Professor (EEE)

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Dr. Dilkeshwar Pandey, Prof., Computer Science Engineering

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

Dr. Gaurav Sharma, Assistant Prof., Mechanical Engineering

Dr. Kunal Bisht, Assistant Prof., Civil Engineering

Dr. Harsh Khatter, Assistant Prof., Computer Science

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

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

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Message from the Face of Cover Page

Dear Readers,

Greetings!

It has been a great honour to be part of the monthly Research Magazine "Anusandhan" released by KIET. I want to express my sincere gratitude to the dedicated efforts of the students and teachers at KIET who consistently contribute to the release of this research-oriented magazine. After perusing the overview of the KIET website, I am delighted to discover that the fundamental focus of the KIET institute lies in the development of a research environment.

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

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

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

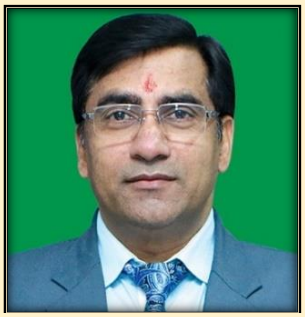
I extend my heartfelt congratulations to KIET Research Magazine for its outstanding efforts in promoting and presenting research within the academic community. There is always something new to discover and explore, and I eagerly anticipate witnessing more incredible research work and discoveries emerging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

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

Warm Regards,

Shri K. Sharan
Chairman and CEO
Greentech Foundation
Vikaspuri, New Delhi – 110018
India

Message from Chief Patron



Dear Esteemed Readers,

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

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

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

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

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

Dr. Anil Ahlawat

Director In Charge

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Patron

Dear All,

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

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

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

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

Dr. Manoj Goel

Joint Director KIET

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Patron

Dear All,

Dear Esteemed Readers,

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

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

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

Dr. Shailesh Tiwari

Additional Director KIET

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Editor-In-Chief

Dear Colleagues and Friends,

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

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

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

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

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

Dr. Vibhav Kumar Sachan

Dean (Research and Development)

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Foreword

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

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

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

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

Dr. Brijesh Singh

Editor
KIET Group of Institutions
Delhi-NCR, Ghaziabad

Foreword

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

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

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

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

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

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

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

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

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

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

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

Overview of the Research and Development

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

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

Vision

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

Mission

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

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

Glimpses of Month

Academic and Research Integrity with AI

A one-day international event titled "Academic and Research Integrity with AI" was organized at KIET Group of Institutions, Delhi NCR, Ghaziabad on 19-04-2024. The event was attended by esteemed Guests James Thorley, Regional Vice President, Turnitin, APAC, United Kingdom; Purna Bose, Senior Solutions Engineer, Turnitin; Manisha Shivpuri, Manager, Turnitin; Dr. Sumit Narula, Director, Amity School of Communication; Dr. Prasoon Tripathi, Director, IMS Ghaziabad; Professor (Dr.) Munish Sabharwal, Executive

Director, IILM University, Greater Noida; research faculty members of KIET, students, and other dignitaries from India and abroad. The program commenced with an address by the Honourable Dr. Manoj Goyal, Joint Director, KIET Group of Institutions.

At the "Academic and Research Integrity with AI" event, Ms. Purna Bose, Senior Solutions Engineer at Turnitin, discussed the important role of their AI authorship detection tools in maintaining academic integrity. Ms. Bose highlighted the functionality of the AI writing prompts feature in Turnitin's similarity report, which provides an additional layer of scrutiny by showing the percentage of AI-generated content without impacting the overall similarity score.

NASA Human Exploration Rover Challenge 2024

Congratulations to Team Interstellars! The SAE-KIET-Mechanical Engineering Department has soared to new heights, clinching the coveted Crash & Burn Award in the prestigious NASA Human Exploration Rover Challenge 2024 in Huntsville, Alabama. Our team emerged victorious, securing the 9th position globally, showcasing unparalleled grit, innovation, and sheer determination after competing against teams from around the globe in this renowned event.

Enjoy the event through the links below:

https://x.com/RoverChallenge/status/1781689231334678734...

https://www.youtube.com/.../Ugkx6G9wT2KASFJnJ09Lt...

Product Development in assistance of Krismatic Naturals

On March 6, 2024, Unisnacks Food and Beverages Unveiled 'Diabenine': A Nutritious Flour for Diabetic and Blood Sugar Management

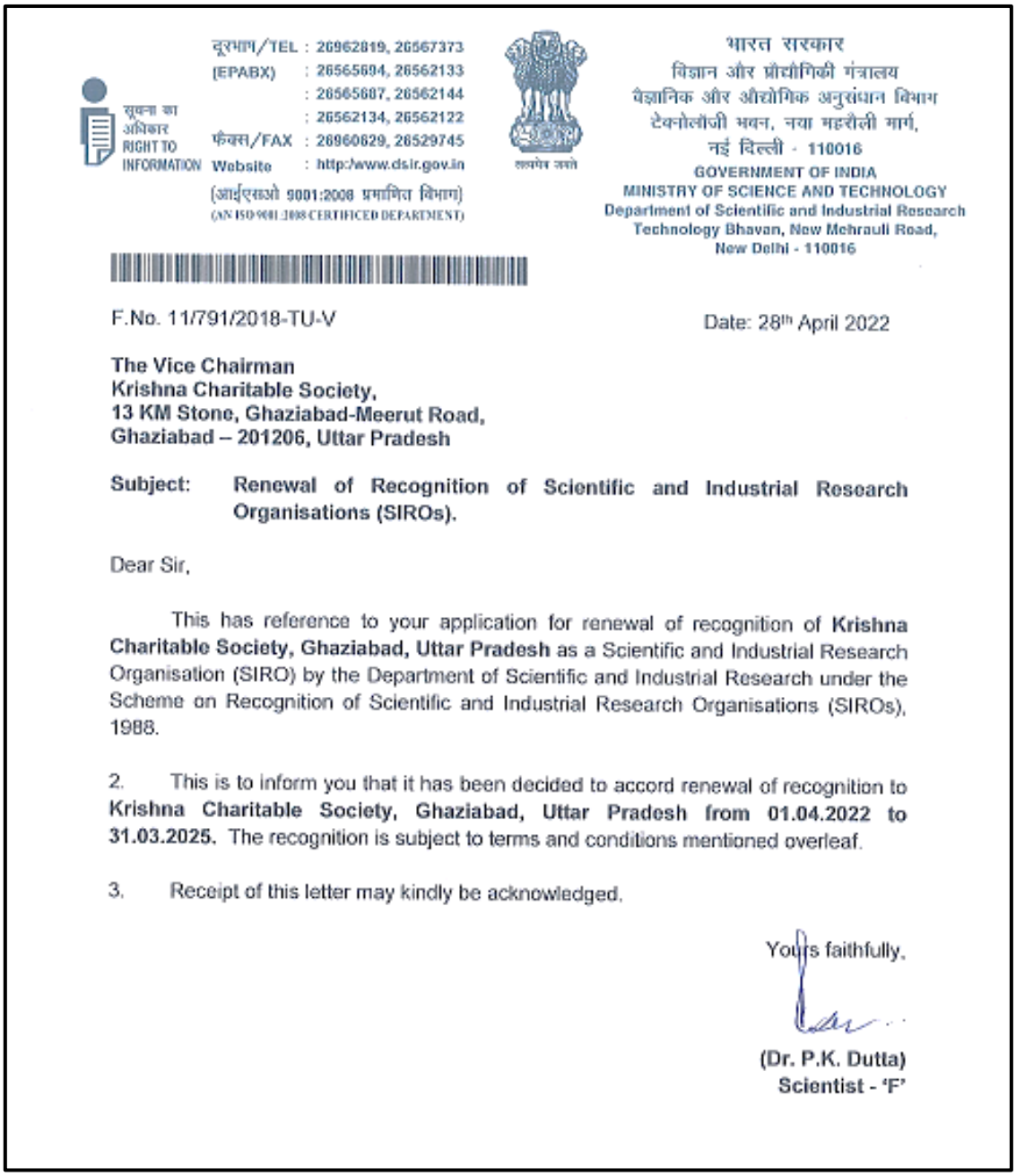
It was an honor to have esteemed dignitaries Dr. Manoj Goel, Dr. Shailesh Tiwari, Dr. K. Nagarajan, Mr. Saurav Kumar, Dr. Preeti Chitkara, and Dr. Kunwar Laiq Ahmad Khan share their insightful ideas and provide invaluable motivation to our team. Their presence added tremendous value to our celebration, and their words of wisdom will continue to inspire us on our journey ahead.

Thanks to Mr. Anuj Pathak for his research support in creating the product with the assistance of Krismatic Naturals.

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)**



सूचना का अधिकार
RIGHT TO INFORMATION

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(EPABX) : 26565694, 26562133
: 26565687, 26562144
: 26562134, 26562122
फैक्स/FAX : 26960629, 26529745
Website : http:/www.dsir.gov.in
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(AN ISO 9001:2008 CERTIFICED DEPARTMENT)

सत्यमेव जयते

भारत सरकार
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वैज्ञानिक और औद्योगिक अनुसंधान विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग,
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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.

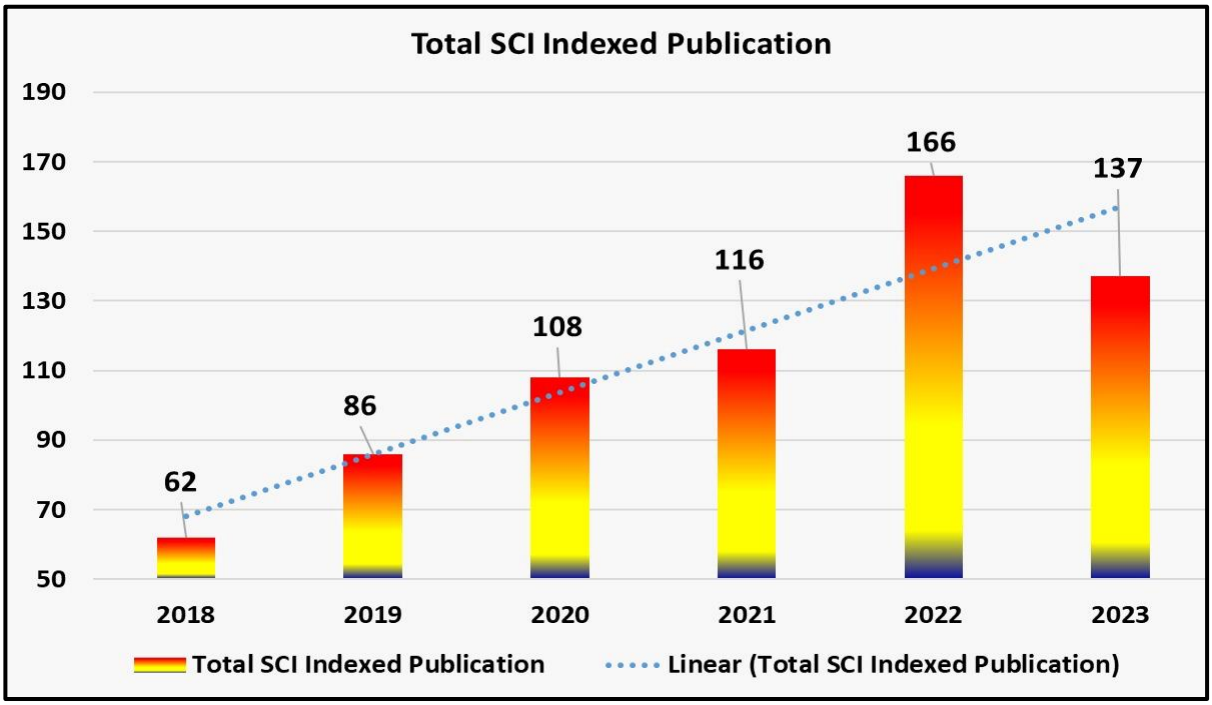
Yours faithfully,

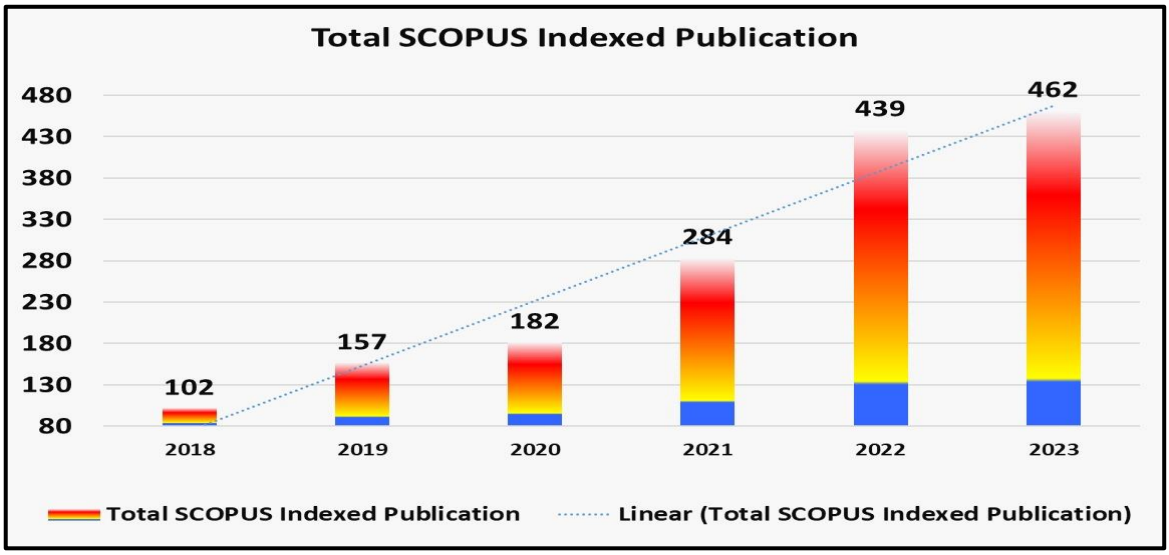
(Dr. P.K. Dutta)
Scientist - 'F'

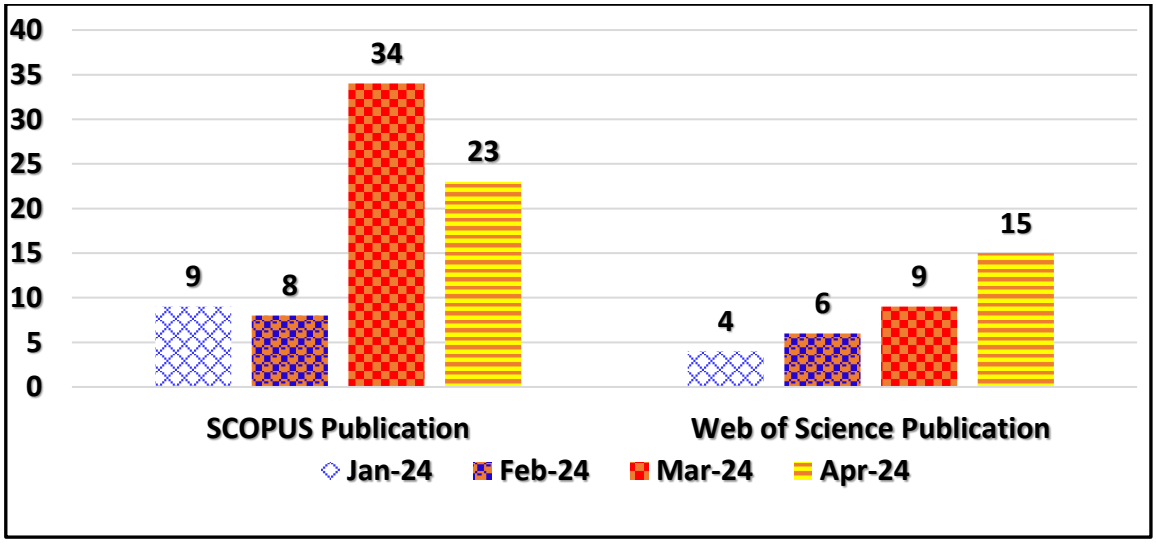
KIET Research Credentials

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 April 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*	34*	74*	108*
Total	709	1703	2412







CATEGORY	Number of Publication (2023-24)			
	Jan-24	Feb-24	March-24	April-24
SCOPUS Publications	*9*	*8*	*34*	*23*
Web of Science Publication	*4*	*6*	*9*	*15*

Details of Patents Published/Granted

Title of the Invention: Automated Electric Ramp

Application Number: 202011026117 (Indian Patent Office)

Applicant(S): KIET Group of institution

Date of Filing: 21-06-2020

Date of Grant: 30-04-2024

Field of the Invention: Embodiments of the present invention generally relate to a system and a method for operating a ramp, and particularly to a system and a method for operating an automated electric ramp.

Objects of the Invention: Embodiments in accordance with the present invention provide an automated ramp system. The system comprising: an electric ramp to be installed at an entry of a house, the electric ramp comprising: a declined platform attached to an elevated surface; sensors connected to a bottom surface of the declined platform configured to sense signals representing a contact of the declined platform with a ground surface; and a control unit connected to the sensors and hydraulic jacks attached to the bottom surface of the declined platform. The control unit is configured to: receive input signals from a user using a panel, wherein the input signals are one of, an upward movement signal, or a downward movement signal; activate the hydraulic jacks using relays based on the received input signals; receive sensed signals representing the contact of the declined platform with the ground surface from the sensors; and deactivate the hydraulic jacks using the relays when the contact of the declined platform with the ground surface is detected based on the received sensed signals.

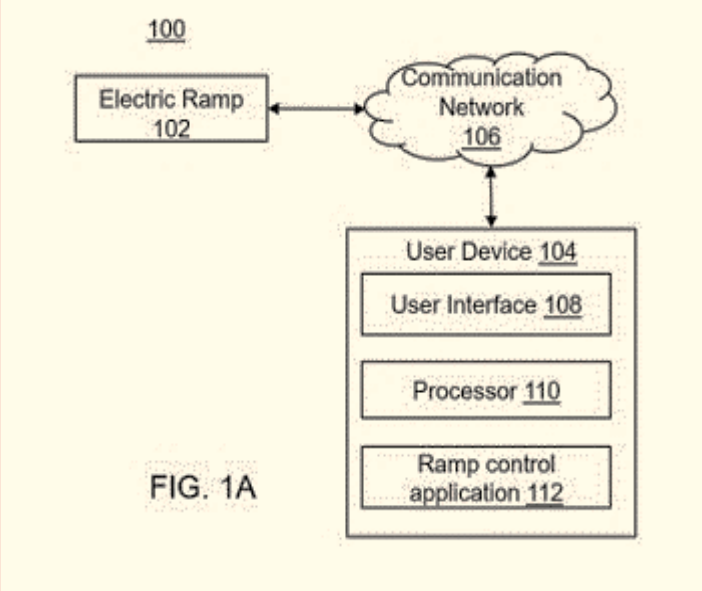


Figure 1: Illustrates a block diagram of an automated ramp system

Title of the Invention: **A Nutriose-Fb06, Ethyl-Cellulose and Hydroxypropyl cellulose based double coated colonic multi-particulate drug delivery**

Application Number: 202411016857 A (Indian Patent Office)

Applicant(S): KSOP, KIET Group of institution

Date of Filing: 08-03-2024

Date of Publishing: 05-04-2024

Field of the Invention: The present invention relates embodiments of the present disclosure relate to nutriose FB06 and hydroxypropyl cellulose (HPC) based combined bacterial enzyme and time dependent dual coated colon-targeted delivery of multi-particulate dosage forms.

Objects of the Invention: The principal object of the embodiments herein is to overcome the drawbacks in the prior art and provide a nutriose FB06 and hydroxypropyl cellulose (HPC) based combined bacterial enzyme and time dependent dual coated colon-targeted delivery of multi-particulate dosage forms using powder layering technology that can utilize the combination of colonic bacterial enzyme and pH as the triggering factors to prevent the early release of drugs before the colon and also to achieve better colon targeting.

Summary of the Invention: Accordingly, the embodiments herein disclose a novel nutriose FB06 and hydroxypropyl cellulose (HPC) based combined bacterial enzyme and time dependent dual coated colon-targeted delivery of multi-particulate dosage forms.

The goal of the current invention is to prepare and analyse Ketoprofen loaded pellets with success powder layering technique that could be a straight or reproducible methodology for the preparation of coated pellets. In a preferred embodiment, studies have focused heavily on colon targeted drug delivery utilising different natural polysaccharides because it has the potential to enhance colon local disease treatment while reducing various systemic side effects.

Nutriose is a dextrin based soluble fibre, prepared from starch. The primary source for the commercial production of nutriose includes cereals like maize, wheat, barley etc.

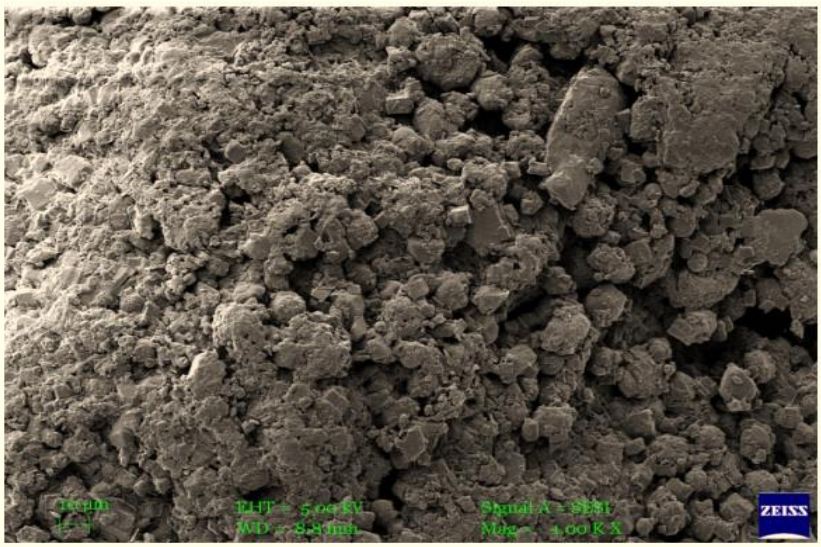


Figure 1: Surface Topography of un-coated ketoprofen drug loaded pellets before dissolution.

Title of the Invention: Method and system for enhanced satellite image processing and analysis

Application Number: 202411017148 A (Indian Patent Office)

Applicant(S): Ms. Shivani, Mr. Ajay Varshney, Mr. Aayush Sharma, Mr. Anubhav Yadav, Dr. Sushil Kumar (CS)

Date of Filing: 10-03-2024

Date of Publishing: 19-04-2024

Field of the Invention: The topic of innovation is satellite image processing, with a specific emphasis on systems and techniques meant to improve the processing and interpretation of satellite images. The invention includes novel methods that are intended to enhance the process of extracting useful information from satellite photos, enable more precise interpretation, and open up a wider variety of applications. With the use of cutting-edge algorithms, computational techniques, and machine learning technologies, the innovation hopes to make a major impact on satellite-based Earth observation and remote sensing on images.

Objective: Enhance Accuracy and Precision: The foremost objective is to improve the accuracy and precision of satellite image processing. This involves the development of advanced algorithms and techniques that can effectively handle the intricate details within satellite imagery, leading to more precise identification, classification, and analysis of objects and features.

Expand Applicability Across Industries: The invention seeks to create a versatile framework that can be applied across diverse industries, such as agriculture, environmental monitoring, urban planning, defense, and disaster management. By providing enhanced processing capabilities, the invention aims to cater to a broad range of applications, contributing to the growth and efficiency of various sectors reliant on satellite data.

Drawings

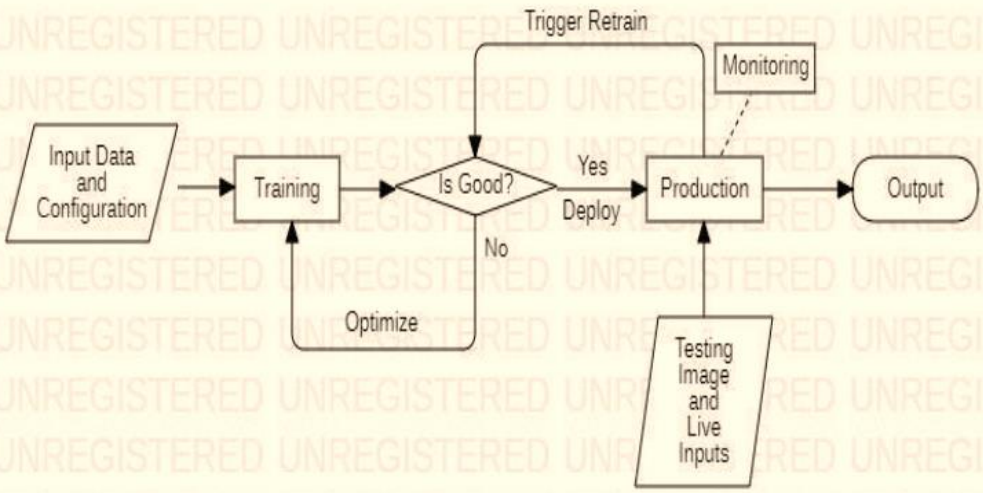


Figure 1: Flowchart of Invention

Title of the Invention: **Dynamic portfolio optimization through ai-enabled predictive investment modeling**

Application Number: 202411017144 A (Indian Patent Office)

Applicant(S): Ms. Punjika Rathi, Dr. Arunima Mishra, Dr. Deepa, Dr. Prateek Gupta (KSOM)

Date of Filing: 10-03-2024

Date of Publishing: 19-04-2024

Field of the Invention: The present invention is related to the Management in Portfolio Optimization using AI field

Objective of the Invention: The primary objective of dynamic portfolio optimization through AI- enabled predictive investment modeling is to maximize portfolio returns. By leveraging advanced algorithms and machine learning, the system aims to identify investment opportunities and allocate assets in a manner that capitalizes on market trends and potential profit opportunities. Another key objective is to minimize portfolio risk. AI-driven models analyze various risk factors and market conditions to optimize asset allocations in a way that balances potential returns with risk mitigation. The goal is to achieve a portfolio that not only generates favorable returns but also does so with a level of risk that aligns with the investor's risk tolerance and financial goals.

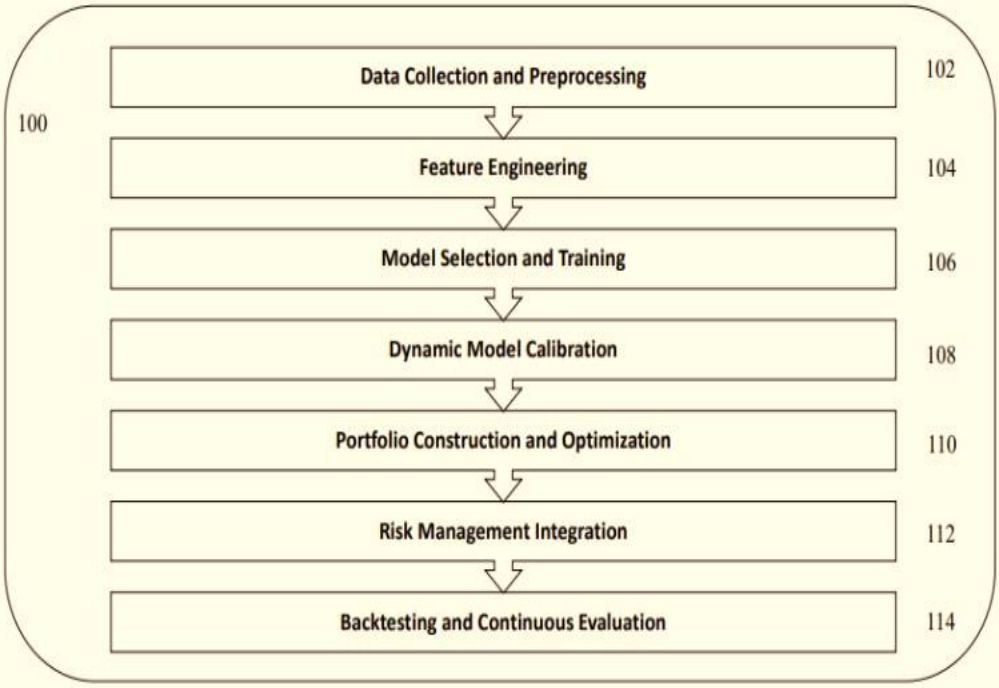


Fig. 1: It shows the input parameter, which is to be processed by the system 100.

Title of the Invention: **Automatic chalk duster cleaning device and method thereof**

Application Number: 202411017470 A (Indian Patent Office)

Applicant(S): Mr. Pradip Kumar Pathak (TBI, KIET)

Date of Filing: 11-03-2024

Date of Publishing: 12-04-2024

Field of The Invention: The invention is related to the device and method for removing dust particles from the pad surface of the chalk duster. The present invention in particular, relates to classroom teaching where black blackboard and chalk is used by the teacher. This invention relates to a device capable of removing dust particles from the pad surface of the chalk duster. The device has two parts. The upper part of the device has a metal mesh that has vibration motors attached to it. The lower part is in the form of a box comprising a Battery, Circuit, and a detachable dust box. When the dust box is full, it can be emptied and reused. The device takes power preliminary from an AC source; in case there is no AC power, it operates on a rechargeable battery.

Objects of the Invention: In the view of the foregoing disadvantages inherent in the known devices and methods used for removing dust particles now present in the prior art, the present invention provides an innovative device for cleaning the chalk duster. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new, simple, cost-effective, and efficient way of removing dust particles from the pad surface of the duster which has all the advantages of the prior art and none of the disadvantages.

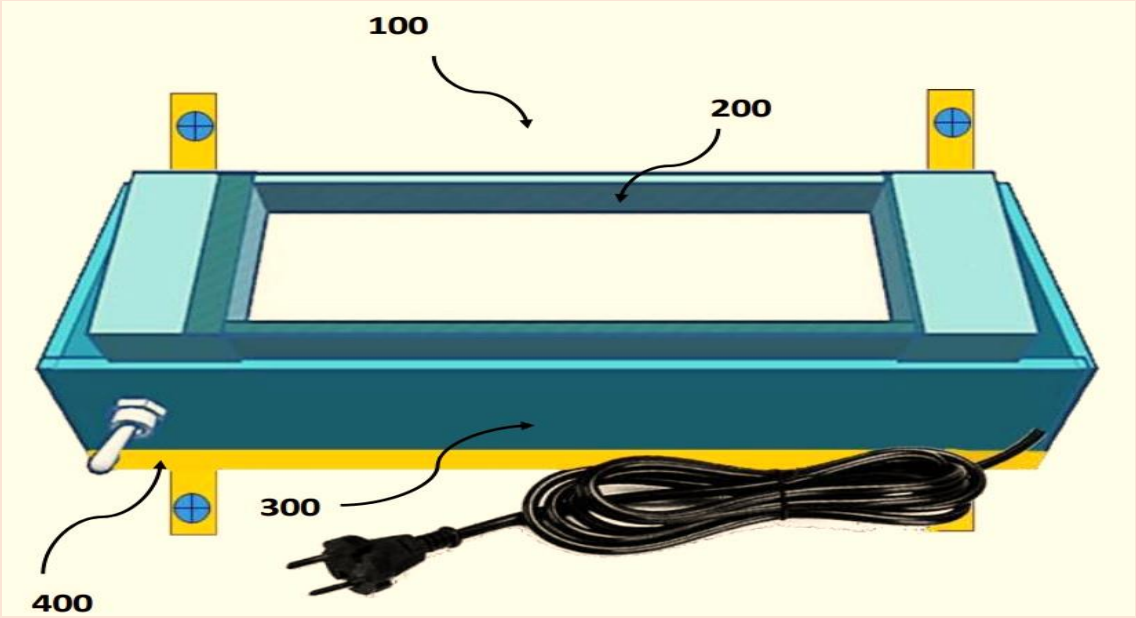


Fig. 1 - Depicts the complete system of the Device

Title of the Invention: Threat detection and neutralisation system

Application Number: 202411017580 A (Indian Patent Office)

Applicant(S): Mr. Shikhar, Ms. Shubhi, Mr. Abhijeet Kannujia, Mr. Sreesh Gaur, Mr. Harsh Khatter (CS)

Date of Filing: 12-03-2024

Date of Publishing: 19-04-2024

Field of The Invention: The present invention is related to the field of computer science; specifically, monitoring system that tracks file access and usage, with security features for

Field of The Invention: The present invention is related to the field of computer science; specifically, monitoring system that tracks file access and usage, with security features for threat detection.

Objects of The Invention: An objective of the present disclosure to make a threat detection and neutralisation system.

The aim is comprehensive file monitoring system that tracks file access and usage, with security features for threat detection.

Abstract of The Invention: This invention focuses on the development of an Improved security System aimed at enhancing the user security and promoting responsible safety measures thus protecting the end user and integrate with existing antivirus tools to provide a more comprehensive security solution. Through sophisticated machine learning algorithms, the system analyses the collected data to make the threat detection system more aware of the amount and the level of threats thus enhancing its capabilities for the future threats. The system also offers valuable insights to: Provide the ability to remotely access and control the mouse and keyboard, making it possible to respond to security threats and intervene if necessary.

REGISTRATION OF DESIGN

Title of The Invention: **Dispensing bottle with liquid collecting base**

Application Number: 408331-001 (Indian Design)

Applicant(S): Shubham Rai, Dr. Rahat Ullah Khan, Mr. Vaibhav Mall, Mr. Sachin Rathore (EE)

Date of Filing: 20-03-2024

Date of Registration: 26-04-2024

Title of the Invention: **Foldable e-bike**

Application Number: 368074-001 (Indian Design)

Applicant(S): Mr. Sharad Mishra (Innovation Centre)

Date of Filing: 04-01-2024

Date of Publishing: 08-03-2024

PATENTS Published – April 2024

S. No.	Title Of Patent	Dept.	Name Of Applicant	Date Of Publication	Status
1.	A systematic approach to strengthening english proficiency and communication skills in students	ECE	Dr. Shraddha Srivastava, Dr. Priyanka Sharma, Dr. Soniya Verma	17-05-2024	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 sign language recognition	CS	Ms. Vidhi, Ms. Vishakha Rana, Ms. Sanskriti Bajpai, Mr. Raj Kumar, Mr. Harsh Khatter	17-05-2024	Published
5.	System and method for developing smart city solutions using IOTand AI	CS	Mr. Amit Kumar Singh Sanger	10-05-2024	Published
6.	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
7.	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
8.	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
9.	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
10.	Smart method for non-fungible token thereof	CS	KIET, Mr. Harsh Khatter, Mr. Avaneesh Singh, Mr. Nishant Varshney, Mr. Harsh Kumar, Mr. Harsh Kumar	17-05-2024	Published

11.	System and method for ai-assisted plant disease detection, crop and fertilizer recommendation system	CS AIML	KIET, Mr. Yash Srivastava , Mr. Harsh Srivastava , Ms. Sejal Gupta, Mr. Raj Kumar	10-05-2024	Published
12.	Detection of autism spectrum disorder using machine learning	CS	Ms. Nishu Gupta, Ms Mani Dwivedi, Dr. Harsh Khatter , Mr. Anurag Mishra	10-05-2024	Published
13.	A novel method for criminal face detection using machine learning based system	CSIT	KIET, Ms. Archana Singh , Ms. Sakshi Mishra , Mr. Prateek Sharma, Ms. Varsha Singh , Ms. Ashima Arya	10-05-2024	Published
14.	Integrating quantum computing into QSAR analysis for drug discovery	CS, KSOP	KIET, Mr. Anurag Mishra, Ms. Sheena Mehta	10-05-2024	Published
15.	Affordable farm equipment sharing platform	CS	KIET, Ms. Shivani, Mr. Govind Singh, Mr. Aman Raj Singh	10-05-2024	Published
16.	Smart sleep hygiene mattress for critical spondylitis patients	EE	KIET, Mr. Brijesh Singh, Mr. Jitendra Kumar Seth	10-05-2024	Published
17.	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
18.	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
19.	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
20.	Ziosafe secure authentication app	CSIT	KIET, Mr. Vijay Yadav, Mr. Siddharth Yadav,	10-05-2024	Published

			Dr. Abhinav Juneja, Dr. Arun Kumar Tripathi		
21.	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
22.	Profit analysis for multistage compressor with multi evaporator type temperature system	MCA	Dr. Neelam Sharma, Dr. Ekata	10-05-2024	Published
23.	Gesture-controlled virtual system	CS	Mr. Pardeep Tyagi, Mr. Deepanshu Singh, Ms. Arushi Gupta , Mr. Harsh Khatter	10-05-2024	Published
24.	System and method to analyze and visualize the code forces progress using code forces API	CS	Ms. Priyanshi, Mr. Priyanshu Raj, Mr. Sagar Srivastava , Mr. Sreesh Gaur , Mr. Harsh Khatter	24-05-2024	Published
25.	Real-time system for telemedicine based on IOT & AI VIA wearable sensors	ECE	Dr. Chirag Aror	17-05-2024	Published
26.	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
27.	Innovative and smart virtual interactive board	CS	KIET, Mr. Pardeep Tyagi, Mr. Vaibhav Mittal, Mr. Vaibhav Singh, Mr. Sarthak Srivastava	10-05-2024	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	24-05-2023	Registration of Design
30.	Laboratory Apparatus SET	KSOP	Prof. (Dr.) N. G. Raghavendra Rao, Dr. Monika Kaurav, Dr. Monika Kaurav, 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

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. Ajay Kumar	Assistant Professor	IT	Recommendation of Machine Learning Techniques for Software Effort Estimation using Multi—Criteria Decision Making	0.9	11,000	SCIE
2.	Dr. Piyush Pant	Assistant Professor	ME	"Surface Integrity Assessment Techniques in EDM Process for Enhancement of Product's Performance: A review	2.7 (Cite Score)	4,000	SCOPUS
3.	Mr. Vipin Deval	Assistant Professor	CSE	Mobile Smart Contracts: Exploring Scalability Challenges and Consensus Mechanisms	3.9	21,000	SCIE
4.	Dr. Varun Gupta	Associate Professor	EN	ECG Signal Analysis using Autoregressive Modelling with and without Baseline Wander	3.2	5,000	SCOPUS
5.	Mr. Salim	Assistant Professor	EN	Controlling and Monitoring of a Solar-Powered DC Motor Using a Wireless Sensor Network	1.5	11,000	SCIE
6.	Dr. Varun Gupta	Associate Professor	EN	An Efficient FrWT and IPCA Tools for an Automated Healthcare CAD System	2.2	11,000	SCIE
7.	Dr. Sweta Shukla	Assistant Professor	AS	Comparative study of Printed and Brush Plated Films	1.2	11,000	SCIE

Highlights of the Published Journal Articles

1. Kumar A (2024) Recommendation of Machine Learning Techniques for Software Effort Estimation using Multi-Criteria Decision Making. JUCS - Journal of Universal Computer Science 30(2): 221-241. https://doi.org/10.3897/jucs.110051

For the development of the software industry, Software Effort Estimation (SEE) is one of the essential tasks. Project managers can overcome budget and time overrun issues by accurately estimating a software project's development effort in the software life cycle. In prior studies, a variety of machine learning methods for SEE modelling were applied. The outcomes for

various performance or accuracy measures are inconclusive. Therefore, a mechanism for assessing machine learning approaches for SEE modelling in the context of several contradictory accuracy measures is desperately needed. This study addresses selecting the most appropriate machine learning technique for SEE modelling as a Multi-Criteria Decision Making (MCDM) problem. The machine learning techniques are selected through a novel approach based on MCDM. In the proposed approach, three MCDM methods- Weighted Aggregated Sum Product Assessment (WASPAS), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and VIseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) were applied to determine the ranking of machine learning techniques on SEE performance based on multiple conflicting accuracy measures. For validating the proposed method, an experimental study was conducted over three SEE datasets using ten machine-learning techniques and six performance measures. Based on MCDM rankings, Random Forest, Support Vector Regression, and Kstar are recommended as the most appropriate machine learning techniques for SEE modelling. The results show how effectively the suggested MCDM-based approach can be used to recommend the appropriate machine learning technique for SEE modelling while considering various competing accuracy or performance measures altogether.

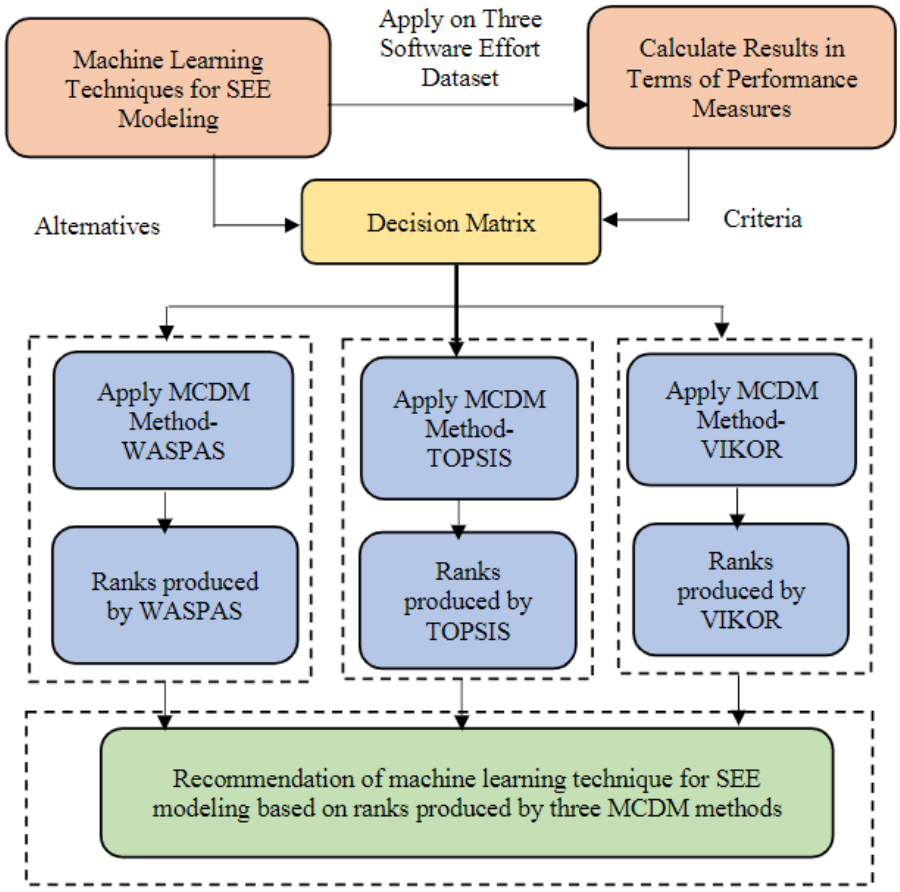


Fig. The process of generating a ranking index for SEE models using the MCDM-based approach

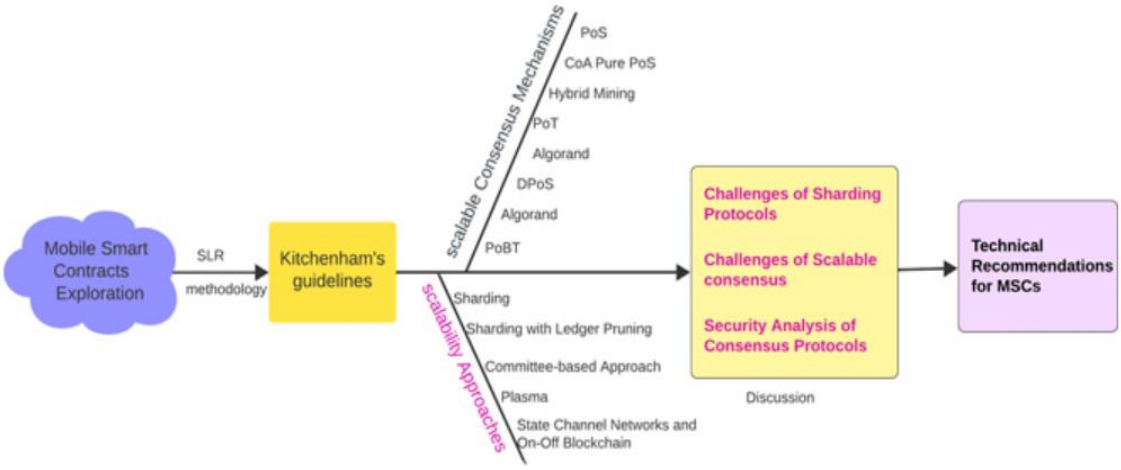
2. Pant, P., & Bharti, P. S. (2022). Surface integrity assessment techniques in EDM process for enhancement of product's performance: a review. *Advances in Materials and Processing Technologies*, *10*(1), 167–185.
https://doi.org/10.1080/2374068X.2022.2155760

In today's scenario, micro-machining process such as µ-EDM finds numerous applications. In µ-EDM process, the specification of the tool is less than 1000 µm. It's a thermo-electrical phenomenon in which object gets eroded by consecutive sparks in between tool and the workpiece. Various process parameters are used in this process. The variation in the process

parameters affects the quality of the machined surface. Surface quality analysis is an essential task for achieving appreciable performance of the product during its intended span. For analysing it, various techniques are used. In this work as an objective, the different techniques employed for analysing the integrity of machined surface for enhancement of product's performance are detailed. In continuation, it is also concluded that analysis of machined surface's integrity provides a supporting benefit to researchers.

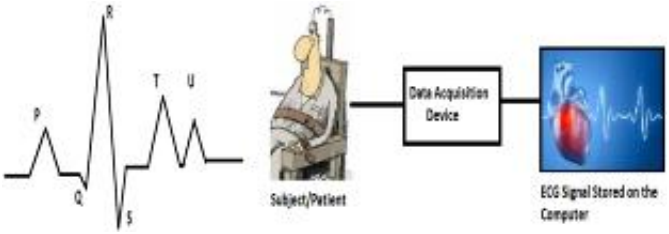
3. V. Deval *et al.*, "Mobile Smart Contracts: Exploring Scalability Challenges and Consensus Mechanisms," in *IEEE Access*, vol. 12, pp. 34265-34288, 2024, doi: 10.1109/ACCESS.2024.3371901.

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. Gupta, V., Saxena, N.K., Kanungo, A. *et al.* ECG signal analysis using autoregressive modelling with and without baseline wander. *Int J Syst Assur Eng Manag* 15, 1119–1146 (2024). https://doi.org/10.1007/s13198-023-02196-5

According to the report of Times of India, India is becoming the heart disease capital of the world. Consequently, its need of time to make more efforts to enhance the research regarding heart and heart disease to keep the country away from facing any unpleasant and disastrous situation in future. For correctly diagnosing the type of heart disease, Electrocardiogram (ECG) is an important tool which conveys the



information in terms of three waves namely; P-wave, QRS-wave, and T-wave. For analyzing the patterns (characteristics) of these waves, Autoregressive (AR) coefficients are required. In this paper,various real recordings are done. For classification purpose, two techniques viz. K-Nearest Neighbor (KNN) and Principal Component analysis (PCA) are used individually. Autoregressive modelling is done on ECG signal with baseline wander (BLW) and ECG signal without BLW for comparing the performance.

5. Salim, & Ohri, J. (2022). Controlling and Monitoring of a Solar-powered DC Motor using a Wireless Sensor Network. *IETE Journal of Research*, *69*(12), 8987–8998. https://doi.org/10.1080/03772063.2022.2073274

Due to the economic challenges of soaring oil costs and natural concerns, India faces an enormous growth in renewable energy resources. The solar photovoltaic technology, as a clean and green energy source, plays a critical role in addressing any country's power shortage. Before mounting a PV system at any location, modeling, simulation, and analysis of solar photovoltaic (PV) generators is a critical phase that helps to understand the behavior and characteristics of the system in real-world climatic conditions. A solar panel, buck–boost converter, separately excited (S.E) DC motor, and controllers, such as Proportional Integral Derivative (PID), Fuzzy, fuzzy based on PID (FPID), and Artificial Neural Network (ANN) controllers are all included in the proposed system. Because compared to other controllers, the ANN controller produces better results. It was designed to deal with system non-linearity and system-related ambiguity. Wireless sensor network (WSN) and Data Dashboard for LabVIEW are used to monitor and control the system.

6. Gupta, V., Saxena, N.K., Kanungo, A. *et al.* An Efficient FrWT and IPCA Tools for an Automated Healthcare CAD System. *Wireless Pers Commun* 133, 2687–2708 (2023). https://doi.org/10.1007/s11277-024-10877-y

Continuous monitoring of physiological parameters is critical in order to minimize casualties, therefore automated healthcare computer-assisted diagnostic systems require efficient signal processing techniques. It is currently the primary concern upon which the majority of research is concentrated. It is becoming a way of life to reach long age by which accurate and error-free treatments are done. Electrocardiograms (ECGs) are crucial in the current era for minimizing the global mortality rate. An essential clinical feature of electrocardiograms (ECGs) is the determination of heart rate. It is measured in beats per minute. It differs based on age and a number of other associated variables, including body position, temperature, emotion, smoke, and hormonal imbalances, among others. Arrhythmia of the heart, characterised by an irregular heart rate, is currently the leading cause of increased mortality. The complete diagnosis of ECG is accomplished using the blocks such as pre-processing, feature extraction, and detection/classification. Unfortunately, the analysis of ECG becomes complex under the wide variety of the recording datasets which is influenced by variety of noises and artifacts. It motivates to choose a novel combination of above-mentioned blocks which can serve the purpose. The fractional wavelet transform (FrWT) is chosen in conjunction with independent principal component analysis (IPCA) in this article. FrWT, which combines the fractional Fourier transform and the wavelet transform, satisfies the requirements for feature extraction and pre-processing, respectively, whereas IPCA satisfies the requirement for detection and classification. It also helps to understand the cardiac and non-cardiac behaviour of the electrical recording of the specific critical cases.

7. Sweta Shukla, Sharma, D.K., Gaur, D. *et al.* Comparative Study of Structural and Opto-Electric Features of Environment Friendly AlSb Screen Printed and Brush Plated Films. *Phys. Metals Metallogry.* 124, 1351–1356 (2023). https://doi.org/10.1134/S0031918X23600720

Aluminium antimonide (AlSb) films are an applicable material in opto-electronic and photovoltaic devices. In the present work, AlSb films were successfully coated on glass substrate via economical screen-printing and brush plating methods. Structural, optical, and electrical attributes of these films were characterized by XRD, HRSEM, EDAX, UV–Vis spectrophotometery and a two-probe technique. XRD analysis revealed that obtained AlSb

films by both methods have (111) plane as favoured orientation with cubic phase structure. EDAX analysis revealed the atomic proportion of Al with Sb was ~1 : 1, which is stoichiometric proportion. HRSEM analysis showed that the surface of AlSb films is layered with sphere-shaped and rough crystals. Numerous pores and large size crystals were observed in the brush plated film as compared with AlSb screen printed film. Via UV–Vis analysis AlSb was established as an indirect optical gap material; with optical band gap value of both type films was observed in close agreement to its theoretical value (1.62 eV). Electrical resistivity measurements via a two-probe equipment, semiconducting nature for both types of films were found. Activation energy was also calculated by employing Arrhenius plot.

Reimbursement of Conference Registration Fee

S. No	Name of Faculty	Designation	Dept.	Name of Conference	Title of Paper	Benefits/ Incentives	Published By
1.	Dr. Urvashi Chugh	Associate Professor	IT	2023 9th International Conference on Signal Processing and Communication (ICSC)	Statistical Physical Model for Rise and Fall Time Analysis of DNMC Systems	10,000	IEEE
2.	Dr. Manish Kumar Singh	Associate Professor	ECE	International Conference on IoT, Communication and Automation Technology (ICICAT — 2023)	Energy Management Techniques of Wireless Sensor Networks for Internet of Things Applications	6,900	IEEE
3.	Mr. Rkashit Bhadoria	Student	IT (IV year)	Recent Developments in Cyber Security (ReDCySec-2023)	A Comprehensive Study of Blockchain Technology Trends and Analysis in the Healthcare Industry 4.0	3,000	Springer
4.	Ms. 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 Diagnosis of Oral Cancer Using Lip and Tongue Images."	8,000	IEEE
5.	Mr. 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	2,000	IEEE
6.	Ms. Kanika Bansal	Student (M.Tech,)	CSE	13th International Advanced Computing Conference (IACC-2023)	A Predictive Deep Learning-Based Approach for Advanced Cancer Classification	2,000	IEEE

7.	Ms. Kanika Bansal	Student (M.Tech,)	CSE	13th International Advanced Computing Conference (IACC-2023)	Predictive Deep Learning: An Analysis of Inception V3, VGG16, and VGG19 Models for Breast Cancer Detection	2,000	IEEE
8.	Ms. Ashima Arya	Assistant Professor	CSIT	Meta — Heuristic Algorithms for Advanced Distributed Systems	Efficient-driven Approaches Related to Meta-Heuristic Algorithms using Machine Learning Techniques	2,000	International Publisher Wiley
9.	Dr. Sapna Juneja	Professor	CSE AI	Meta-Heuristic Algorithms for Advanced Distributed Systems	Meta-Heuristic Algorithms for Advanced Distributed Systems	2,000	International Publisher Wiley

Highlights of the Published Conference Papers

1. Chugh, U., Singh, S. P., Mishra, S., & Singh, G. (2023). Statistical Physical Model for Rise and Fall Time Analysis of DMNC System. In J. Mohan, & B. Chaturvedi (Eds.), *2023 9th International Conference on Signal Processing and Communication, ICSC 2023* (pp. 185-189). ICSC 2023, Institute of Electrical and Electronics Engineers Inc.. https://doi.org/10.1109/ICSC60394.2023.10441262

Nano communication is having a subset class of Diffusion Molecular Communication (DMC) which is the most popular and evolving. Time channel is a common channel model in diffusive MNC. Diffusion of Molecules in DMC results in prediction of performance metrics and count of diffused molecules as well. It is most important to mention that rise time as well as fall time both significantly contribute to overall transmission and reception time duration. DMC has great applicability in a spherical shaped environment in contrast to a rectangular-shaped environment. Human body has many entities which such as the kidney, stomach, lungs, and cells are sphere-shaped, so they have great importance in DMC. Therefore, in this short Communication, rise time and fall time of the DMC system are analyzed by presenting close form expressions of each of them. The rising time value decreases and the fall time value increases with increasing transmitter and receiver distance. Numerical analysis shows a good match with the theory. Also, the proposed work is beneficial for future nano networks applications that interface with biological processes in living things because of its close association with biological environment and viability at cellular networks.

2. M. K. Singh, D. Saxena, A. Rai and D. Kushwaha, "Energy Management Techniques of Wireless Sensor Networks for Internet of Things Applications," *2023 International Conference on IoT, Communication and Automation Technology (ICICAT)*, Gorakhpur, India, 2023, pp. 1-6, DOI: 10.1109/ICICAT57735.2023.10263766

The development and use of new technologies such as machine learning, the Internet of Things, and machine-to-machine (M2M) networks are driving the use of large wireless sensor network (WSN) deployment. However, the main constraint in the WSN is the finite energy supply of node batteries. So, ensuring a network remains operational for the longest possible period, it relies on the effective utilization of sensor node energy in data sensing, processing, and communication tasks. To achieve this initiative, various energy management techniques for WSNs are discussed which include sleep-wake scheduling, MIMO techniques, multihop technique, energy harvesting, clustering and routing, distributed source coding, and machine learning-based WSN. The simulation results of some techniques depict that it reduces energy consumption and therefore, it helps to enhance the lifetime of WSN in the IoTs application. Maintaining the quality of service and increasing the lifetime of WSNs in various applications

in a dynamic network condition is a challenging task. ML can make the computing process more reliable, energy-efficient, and cost-effective in dynamic conditions.

3. Bhadoria, R., Singh, P., Ahmad, S. (2024). A Comprehensive Study of Blockchain Technology Trends and Analysis in the Healthcare Industry 4.0. In: Roy, N.R., Tanwar, S., Batra, U. (eds) Cyber Security and Digital Forensics. REDCYSEC 2023. Lecture Notes in Networks and Systems, vol 896. Springer, Singapore. https://doi.org/10.1007/978-981-99-9811-1_45

Blockchain could be a modern innovation that's being worked out to provide innovational results in various diligence, including healthcare. Within the healthcare region, a blockchain network is used to store and share quiet information among clinics, person labs, medication companies, and croakers. Blockchain operations may appropriately descry serious crimes, including those that are parlous, within the therapeutic assiduity. Within the healthcare region, it may in this way improve the viability, screen, and translucency of taking part therapeutic information. With the utilize of this innovation, therapeutic teach may more get it and test persistent commentaries. In this paper, we showed up at blockchain innovation and its imperative vantages for the healthcare assiduity. Plates are worked out to illustrate how blockchain innovation may back worldwide healthcare through its various capabilities, enablers, and solidified work-flow handle.

4. 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.

5. 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.

6. Kansal, K., Sharma, S. (2024). A Predictive Deep Learning Ensemble-Based Approach for Advanced Cancer Classification. In: Garg, D., Rodrigues, J.J.P.C., Gupta,

S.K., Cheng, X., Sarao, P., Patel, G.S. (eds) Advanced Computing. IACC 2023. Communications in Computer and Information Science, vol 2054. Springer, Cham. https://doi.org/10.1007/978-3-031-56703-2_27

Breast cancer is a significant contributor to the death rate of women in developing and underdeveloped nations. Timely identification and categorization of breast cancer can facilitate the administration of the most optimal therapy to patients. Using ensemble learning, we presented a novel deep-learning architecture for breast cancer detection and classification in breast ultrasound images. In the proposed work, image features are extracted using three pre-trained CNN architectures, DenseNet121, DenseNet169, and DenseNet201, which are then averaged to form an ensemble model. Experiments are conducted using Kaggle's publicly available data set to evaluate the performance of the proposed architecture. Regarding accuracy in detecting and classifying breast cancer in ultrasound images, it has been visible that the proposed ensemble architecture outperforms other pre-defined deep learning architectures with an accuracy of 99.62%.

7. Kansal, K., Sharma, S. (2024). Predictive Deep Learning: An Analysis of Inception V3, VGG16, and VGG19 Models for Breast Cancer Detection. In: Garg, D., Rodrigues, J.J.P.C., Gupta, S.K., Cheng, X., Sarao, P., Patel, G.S. (eds) Advanced Computing. IACC 2023. Communications in Computer and Information Science, vol 2054. Springer, Cham. https://doi.org/10.1007/978-3-031-56703-2_28

Breast cancer is a major contributor to cancer-related death in women. A higher likelihood of survival could result from early detection if the patient could receive the appropriate medicine while it is still in its early stages. Most often, a medical professional will use medical imaging or manual physical analysis to make a diagnosis. These efforts might be drastically cut with an automated approach. Using deep learning approaches, this paper proposes a system for autonomously analyzing ultrasound pictures. Using data obtained from the web repository Kaggle, three deep learning models—InceptionV3, VGG16, and VGG19—are applied to validate the suggested method. With the help of a confusion matrix and accuracy metrics, we compare the outcomes produced by these three deep learning methods. With an accuracy rate of 99.75%, the InceptionV3 model proved to be the most effective.

8. Ashima Arya, Swasti Singhal and Rashika Bangroo, "Efficient-driven Approaches Related to Meta-Heuristic Algorithms using Machine Learning Techniques", Book on Meta Heuristic Algorithms for advanced distributed systems, Wiley Publication 2024

The optimization approach is a vital tool that may be used to acquire the design parameters that are sought as well as the optimal operating circumstances. This would provide direction for the experimental effort and lessen the risks as well as the costs associated with designing and managing the system. Optimization is the process of identifying the values of the decision variables that produce the highest or lowest value of one or more desired outcomes. The design of objective functions and the optimization approach that is chosen both have a role in determining the reliability of optimal solutions. For optimization, a mathematical model is required that both describes and analyses the behaviour of the mechanism. When dealing with complicated nonlinear systems, optimization search may be able to assist in the estimation of unknown parameters. In dynamic processes, robust optimization might be used to find the uncertainty variables. The approach of scale-up and the design of multiphase reactors and flow systems might both benefit from the application of optimization as a tool. Manufacturing and engineering activities will not have the same level of efficiency that they do right now if the designs and operations are not optimized [1]. Figure 6.1 shows the various types of optimization approaches.

9. Sapna Juneja, A Book on Meta-Heuristic Algorithms for Advanced Distributed Systems, Wiley Publication, 2024

Meta-heuristic techniques are increasingly gaining favor as tools for optimizing distributed systems—generally, to enhance the utility and precision of database searches. Carefully applied, they can increase system effectiveness, streamline operations, and reduce cost. Since many of these techniques are derived from nature, they offer considerable scope for research and development, with the result that this field is growing rapidly.

Innovation Spotlights of the Month

Ozone Depletion and Its Impact on Antarctic Biota

A recent study published in the journal Global Change Biology has raised concerns about the persistent ozone depletion over Antarctica and its potential consequences for the region's plant and animal species. The study highlights that the ozone hole, which forms over Antarctica each spring, has started to shrink in the past 25 years but has persisted for an unusually long time over the last four years.

Importance of the Ozone Layer

- The ozone layer is a region of Earth's stratosphere that absorbs most of the Sun's ultraviolet (UV) radiation, particularly UV-B rays.
- Ozone depletion occurs when chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODS) released by human activities interact with UV rays, breaking down ozone molecules.
- The Montreal Protocol, signed in 1987, has been successful in phasing out the production of CFCs and other ODS, leading to a gradual recovery of the ozone layer.

Consequences of Extended Ozone Depletion

The study suggests that the prolonged ozone depletion until late December is concerning because it coincides with the beginning of the austral summer. High incident UV-B radiation during this period, along with snowmelt and the emergence of vegetation, means that Antarctic biota is more exposed to harmful radiation. The start of summer is also the peak breeding season for many animals, and extreme UV-B exposure (UV index up to 14) may occur at a vulnerable time in their life cycles.

About Antarctic Ozone Hole

- The Antarctic ozone hole was first discovered in 1985 by British Antarctic Survey scientists.
- The hole forms during the Antarctic spring (September to November) when cold temperatures allow the formation of polar stratospheric clouds, which provide a surface for ozone-depleting reactions to occur.
- The size of the ozone hole peaked in 2006 at 29.6 million square kilometers (11.4 million square miles), roughly the size of North America.
- The recovery of the ozone layer is expected to take several decades, with the Antarctic ozone hole projected to disappear by the 2060s.

About Montreal Protocol

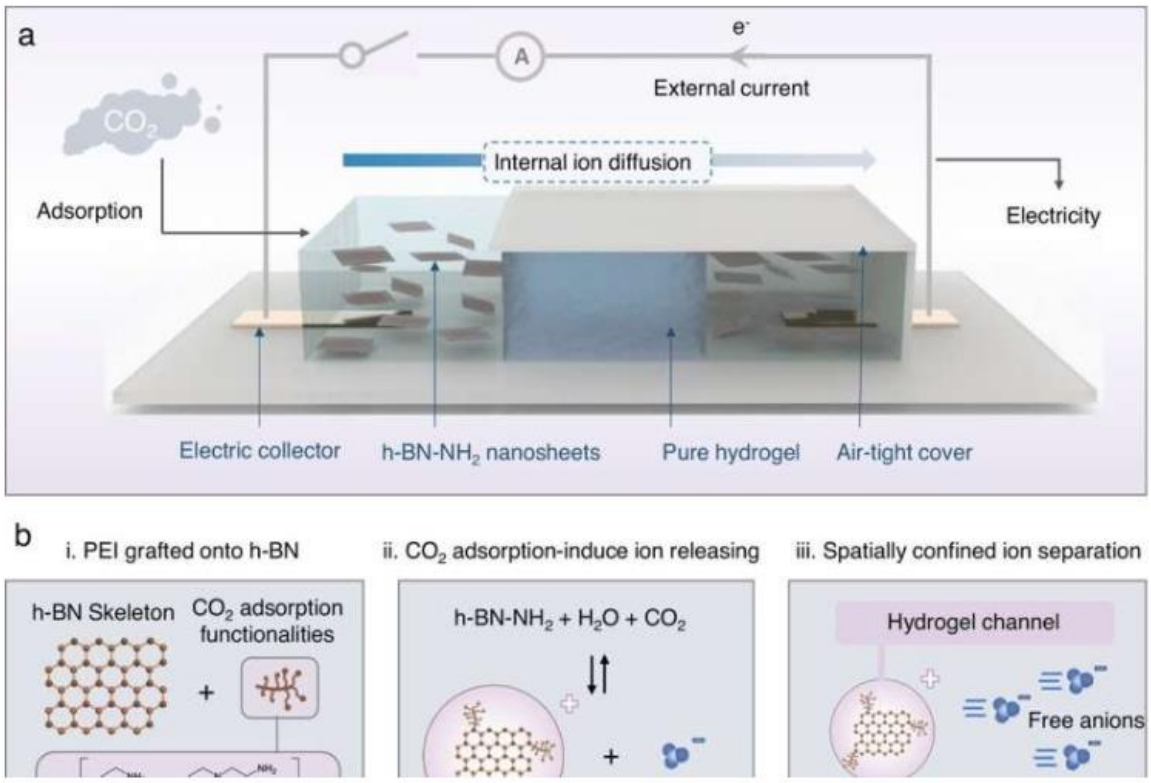
- The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production and consumption of ODS.
- It has been ratified by 197 countries, making it the first treaty in the history of the United Nations to achieve universal ratification.
- The protocol has been successful in reducing the atmospheric concentrations of key OD, such as CFCs and halons, by over 90% since its implementation.
- Without the Montreal Protocol, the ozone layer would have collapsed by 2050, with devastating consequences for life on Earth.

Continued research and international cooperation are crucial for understanding and mitigating the consequences of ozone depletion and ensuring the protection of Antarctic ecosystems.

Source: https://www.gktoday.in/ozone-depletion-and-its-impact-on-antarctic-biota/

NanoGenerator That Uses CO2 To Produce Electricity

With potential applications ranging from mobile devices to industrial energy systems, this initiative marks a significant step towards a more sustainable future.



Researchers at the University of Queensland, led by Dr. Zhuyuan Wang from the Dow Center for Sustainable Engineering Innovation, have developed a carbon-negative generator that utilizes carbon dioxide (CO2) to produce electricity. This small, proof-of-concept nanogenerator is crafted from a polyamine gel—common in industrial CO2 absorption—and a boron nitrate skeleton, which is merely a few atoms thick. This combination generates positive and negative ions, with the disparity in their sizes creating a diffusion current that can be converted into usable electricity.

The team explained that the generator operates on a principle where the movement of ions, rather than electrons, facilitates a more efficient energy conversion, akin to natural processes in the human body. The components of the generator are embedded within a hydrogel, primarily consisting of water, and shaped into disks and rectangles for testing in a CO2-rich environment. Upon observing electrical output, they validated the findings, underscoring the potential of this technology to significantly impact energy generation and carbon capture.

The initial tests showed that the technology could harness about 1% of the energy inherently carried by CO2 gas, with plans to enhance efficiency and reduce costs in future developments. They highlighted the nanogenerator's potential applications, including personal devices that could utilize atmospheric CO2 to power mobile phones or laptops. Another ambitious application involves scaling up the technology to integrate with industrial CO2 capture processes to generate electricity.

The ongoing development of this nanogenerator is part of the broader GETCO2 initiative, spearheaded by the ARC Center of Excellence for Green Electrochemical Transformation of Carbon Dioxide, directed by Professor Zhang at UQ's School of Chemical Engineering. This initiative aims to transform the perception and utility of CO2, viewing it not just as an environmental challenge but as a valuable resource for sustainable energy solutions.

Source: https://www.electronicsforu.com/news/nanogenerator-that-uses-co2-to-produce-electricity

Solar-Powered Emission-Free Tech Turns Saltwater into Drinking Water

This solar-powered system converts salt water into fresh drinking water and presents a cost-effective solution for rural areas, promising to address waterborne diseases and enhance agricultural sustainability.

Water stress affects approximately a quarter of the global population, with 1.6 billion people in rural areas facing water scarcity. In India, where 60% of land has saline water, efficient desalination methods are urgently needed. Traditional desalination technologies often rely on costly batteries or unreliable grid systems, limiting their accessibility in developing countries.

Scientists have unveiled a solar-powered system designed to convert saltwater into fresh drinking water, potentially reducing waterborne diseases like cholera. This new system, offers a more than 20% cost reduction compared to traditional methods and is suitable for deployment in rural areas worldwide. The technology, developed by researchers from King's College London in collaboration with MIT and the Helmholtz Institute for Renewable Energy Systems, builds upon existing processes for converting saline groundwater to freshwater. By utilizing specialized membranes to separate salt ions from water, the system ensures consistent freshwater production using solar energy.

A key feature of the system is its adaptability to variable sunlight conditions, achieved by adjusting voltage and saltwater flow rates. Testing conducted in rural communities, such as Chelleru in India and replicated conditions in New Mexico, demonstrated the system's capability to produce up to 10 m3 of fresh drinking water per day, enough for 3,000 people. The team emphasized the potential benefits for rural communities, citing increased water supply and associated health improvements. The system's ability to operate off-grid offers a sustainable, cost-effective alternative for communities facing water scarcity and contamination. They highlighted the system's affordability and sustainability, noting its potential for use beyond developing areas, including agriculture. The team plans to scale up the technology's availability in India through local partnerships and establish a startup with MIT to commercialize the technology.

The system's application in wastewater treatment and ocean alkalinity enhancement for CO2 absorption demonstrates its broader environmental and climate benefits. By providing a low-cost, energy-efficient solution, the technology has the potential to transform water access and agricultural practices, contributing to global sustainability efforts.

Source: https://www.electronicsforu.com/news/solar-powered-emission-free-tech-turns-saltwater-into-drinking-water

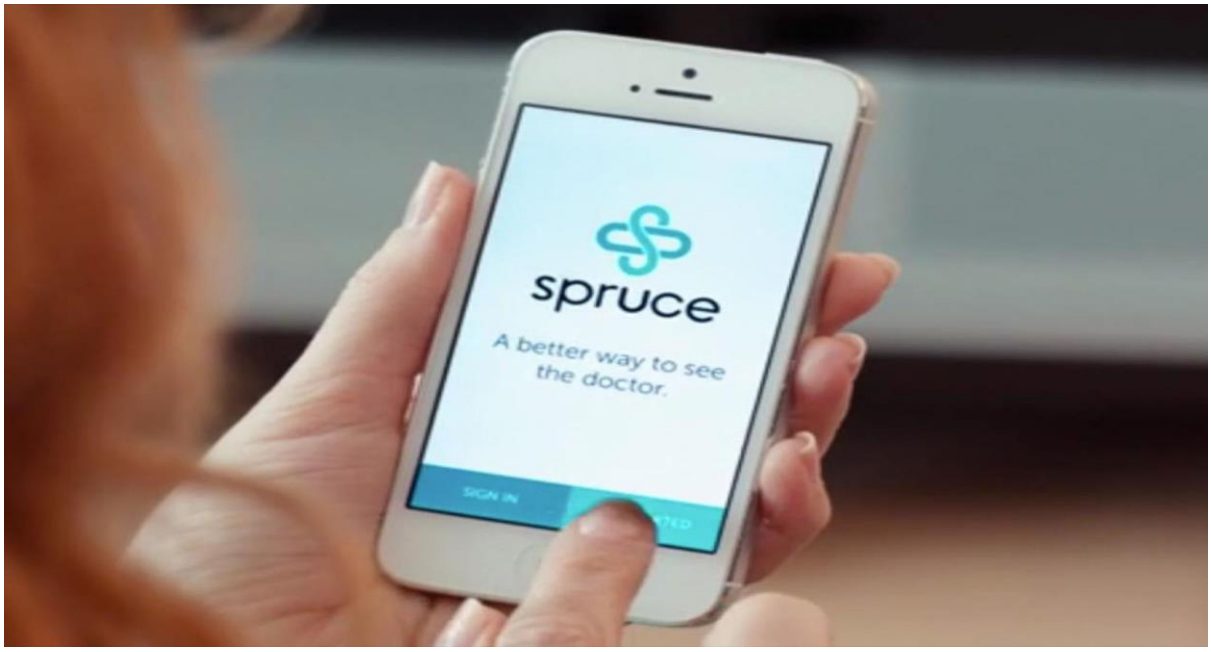
ACNE Treatment App

Spruce Health uses an app as the form of an acne treatment method to provide people with personalized plans to help improve skin. Rather than having to book a visit with a dermatologist and go to see them in person, the app makes it so that you can simply take a photo of yourself and receive a consultation from a doctor. Alongside selfies, users of this app are asked to answer a few questions on the conditions of their acne, in order to better inform dermatologists. So far, there are over 10 board-certified doctors to consult with the app, who will provide a custom treatment plan to you within 24 hours. If medication is suggested, the app even makes it so that a doctor can send a prescription to a pharmacy nearby.

1. Virtual Dermatology Consulting - Develop apps that provide virtual access to dermatology professionals for personalized skin treatment plans.

2. Artificial Intelligence-assisted Acne Treatment - Use AI to analyse skin conditions based on users' uploaded photos and provide personalized recommendations for acne treatment.

3. At-home Skin Care Solutions - Offer users self-help solutions for their skin problems, from acne treatment to personalized skincare routines.



Spruce Health App

Source: **www.trendhunter.com**

Newspaper: Monthly Technical Spotlights

The 'import restrictions' on solar PV cells

What is the Approved List of Models and Manufacturers of Solar Photovoltaic Modules? Why was it re-implemented after being 'kept in abeyance' for two years? How did China become a dominant player in the import of solar PV modules?

EXPLAINER

Kunal Shankar
Saptaparno Ghosh

The story so far:

Recent government orders on attempts to increase local sourcing of solar modules to support India's renewables manufacturing ecosystem has been widely reported in the media as 'import restrictions'. This follows the Ministry of New and Renewable Energy's (MNRE), March 29 order to re-implement its 2021 notification of an 'Approved List of Models and Manufacturers of Solar Photovoltaic [PV] Modules', also called the ALMM list.

What is the ALMM list? Why is it being re-implemented?

This list consists of manufacturers who *"are eligible for use in Government Projects/Government assisted projects/ projects under Government schemes & programmes.... including projects set up for sale of electricity to the Central and State Governments."* However, this notification was "kept in abeyance" two years after it was issued, for the past financial year. While the government did not give an explicit reason for this, it has been reported that it stems from concerns and demands of renewable power producers who had secured sale contracts with the government before these rules were issued, when solar modules and cells were overwhelmingly imported from China at highly competitive rates. India's domestic renewables sector, at the time, was unlikely to meet the spike in demand for solar power production equipment at rates offered by Chinese manufacturers.

The government's re-introduction of this rule has been premised on the estimation that following measures, such as the Production Linked Incentive (PLI) scheme, India's domestic sector has boosted its production capacities and bettered price competitiveness to meet local demand. This is an import substitution effort, and not an attempt to restrict imports.

Towards the sun: Solar panels in Pavagada Solar Park in Kyataganacharulu, Karnataka. GETTY IMAGES

Does India rely on solar PV imports?

India is overwhelmingly import dependent to meet its demand for solar cells and modules – with China and Vietnam being the country's major suppliers. According to a reply by the Minister for New and Renewable Energy in Parliament in February last year, India imported about $11.17 billion worth solar cells and modules in the past five years. This is worth 0.4% of India's total exports in the same period. And until January of 2023-24, data from the Ministry of Commerce's Import-Export showed that China accounted for 53% of India's solar cell imports, and 63% of solar PV modules. Ratings agency ICRA estimates that China commands more than 80% share of the manufacturing capacity across polysilicon, wafer, cell and modules. "In comparison, the manufacturing capacity in India is relatively low and is largely restricted to the last manufacturing stage," ICRA stated in its November 2023 report, adding that the PLI scheme is expected to change this, with integrated module units expected to come up in India over the next 2-3 years.

How have our policies responded?

To address this over dependence, India made three significant efforts over the past five years. It began with the notification of the ALMM order in January 2019. But the issue attained centre stage in the wake of severe global supply chain disruptions during the COVID-19 pandemic. Finance Minister Nirmala Sitharaman proposed the ₹19,500 crore PLI scheme in the Union Budget of 2022-23. This was to scale domestic manufacturing of the entire solar supply chain – from polysilicon to solar modules. The government also introduced a steep 40% customs duty on PV modules and 25% on PV cells. These duties were halved as solar capacity additions slowed and as *Reuters* had reported, developers had quoted "aggressively low tariffs" to win power purchase contracts based on imports of Chinese equipment that put cost pressure on about 30 GW capacity worth projects.

Why is China a leading exporter?

In a July 2022 report, the International Energy Agency (IEA) noted that China was the most cost-competitive location to manufacture all components of the solar PV supply chains. This is mainly because of the lower cost of power supplied to the industry, the agency observed, as electricity accounts for more than 40% of production costs for polysilicon and almost 20% for ingots and wafers. The IEA also observed that 'Chinese government policies prioritised solar PV as a strategic sector, and growing domestic demand enabled economies of scale and supported continuous innovation throughout the supply chain.'"

What is the scope for solar in India?

The government's ambitious target of 500 GW of installed capacity from non-fossil fuels by 2030 is the main driver to scale solar power in India. India also accounts for the fastest rate of growth for demand of electricity through 2026 among major economies, according to the IEA. This is because of strong economic activity and expanding consumption of products to mitigate extreme weather. Solar power accounted for about one-third of all energy generated from renewables between April last year and February this year. "The country has an estimated solar power potential of 748.99 GW. Hence, the potential of solar energy is not fully tapped, so far. The government is making efforts to harness the available potential through various schemes & programs," MNRE Minister R.K. Singh said in Parliament last year.

THE GIST

- India is overwhelmingly import dependent to meet its demand for solar cells and modules — with China and Vietnam being the country's major suppliers.
- Following measures, such as the Production Linked Incentive (PLI) scheme, India's domestic sector has boosted its production capacities and bettered price competitiveness to meet local demand.
- The government's ambitious target of 500 GW of installed capacity from non-fossil fuels by 2030 is the main driver to scale solar power in India. India also accounts for the fastest rate of growth for demand of electricity through 2026 among major economies, according to the IEA.

Talk like a woman: Surgery helps trans women find their voices

Those who struggle with their old, 'male' voices now have the option of completing their transition as voice feminisation procedures become more accessible in metros

Mohua Das &
Sumitra Deb Roy | TNN

When you dial Payal Nikhumb's number, the voice that greets you is calm and gentle. Her words flow at ease, drawing you in. The 27-year-old from Maharashtra's Dhule district has come a long way from the confused, isolated Yogesh she once used to be. However, the one thing that hadn't changed despite hormone therapy and surgeries that altered her sexual function, gave her breasts, thinned her body hair, and feminised her appearance, was: her voice. And it hindered an important step in her transition.

"My deep voice was a reminder of the disconnect between what I was born as and the gender I identify with," says the model and belly dancer, who transitioned through a sex reassignment surgery seven years ago. "On dates or during casting calls, I'd be asked, 'You look like a pretty girl but are you transgender?'," — a question that often marked an abrupt end of conversations. Things changed after Payal underwent vocal surgery a year ago. "Within six months, my voice transformed completely," she says, the joy palpable in her new voice. "It was awesome. Now, I get daily compliments on my voice from people who have no idea about my past."

With vocal surgery for transgender individuals increasingly recognised as a vital aspect of transitioning, more hospitals in the bigger cities are offering it. Recently, the state-run GT Hospital in Mumbai's Dhobi Talao announced its plan to introduce this surgery, potentially becoming the first government institution to offer it free in the state.

"A disconnect between a person's voice and gender can out them as transgender, costing them relationships or making them a target of violent acts. We think this surgery will help many who can't afford it or don't know where to undergo it," says Dr Pallavi Saple, dean of JJ Group of Hospitals that includes GT Hospital. GT has tied up with Dr Nupur Nerurkar, a founding member of the International Association of Trans Voice Surgeons, to improve quality of voice care as well as surgical techniques for transgender women.

HOW A GLOTTOPLASTY WORKS

- Endoscopic surgery, no cut on neck. Performed under general anaesthesia
- Vocal fold length shortened by 50% which instantly increases the pitch and makes it a feminine voice
- Anterior part of vocal folds made raw and stitched together with 2-4 very thin sutures
- No talking permitted for 2 weeks after surgery
- Complete healing and new voice usually takes 6-8 weeks

Pitch — how fast the vocal cords vibrate — is key to a voice sounding masculine or feminine. "In males, it's typically 100 vibrations per second, while in females, it's around 200," says Dr Nerurkar, who has conducted around 60 trans voice feminisation surgeries over 15 years for transgender women (those assigned male at birth but identify and transition to female). "For trans men, taking testosterone during their gender reassignment surgery naturally drops the voice pitch. So, surgery to masculinise the voice isn't usually needed," she says.

However, for trans women, while surgeries like breast augmentation, vaginoplasty, hormonal therapy, and facioplastic surgery are commonly performed to feminise their appearance, interventions like estrogen don't do much for their voice, adds Nerurkar. "So they try to make their voices sound more feminine by speaking in a higher pitch, but that can be exhausting and give them vocal fatigue. Plus, if they cough, sneeze, or get angry, their voice may revert to its original tone, giving away their identity. That's why many of them opt for voice feminisation surgery."

Another reason more people are opting for it is an advancement in technique that came about 15 years ago with German surgeon Prof. Juergen Wendler's glottoplasty technique. Dr Nerurkar describes it as a minimally invasive procedure performed endoscopically. "It results in a higher pitch with no cuts or scars on the neck."

A 46-year-old skincare expert from the northeast, who was the first to be operated on by Nerurkar using the endoscopic approach, says the surgery "boosted self-confidence," particularly in her professional space. "But surgery is not a quick fix," she adds.

Even after surgery, a transgender woman may still speak with her previous vocal tendencies, despite a more feminine tone. "To address this, we suggest voice and speech therapy sessions to refine the breathiness, accent, intonation, and inflections for a more feminine voice," explains Nerurkar.

"However, counselling is also very important. Many come with high expectations but the voice may not be 100 percent perfect," says Dr Jayakumar Menon, a senior laryngologist who has conducted around 12 trans voice surgeries at the Ananthapuri Hospital in Trivandrum since 2014.

Born and raised in Hyderabad as a man, Smita, (name changed), who underwent gender reassignment surgery in 2021 understands that. "Previously, my voice could reach at least three floors, but now it seems to struggle to carry across a big room. But I finally love hearing my voice," says the 32-year-old. Her ultimate affirmation is a reassuring address of 'Ma'am' from a caller. "It puts me on cloud nine," she exults.

There is a glaring gap between surgeries performed and the large transgender population in India, points out Dr Nerurkar. "While the number of surgeries has risen significantly since adopting the glottoplasty technique seven years ago, it's still a small fraction compared to the transgender population in India," she says. According to the 2011 census, there were 4,87,803 individuals identified as 'other' or the third gender in India.

Despite the procedure available at private hospitals, ranging from Rs 70,000 in the general ward to Rs 1 lakh, doctors recognise the lack of family support and financial means that many transgender individuals face. In cases such as this, the tie up with the state-run GT Hospital, could be a significant step forward.

Green hydrogen push needs to be substantive

Net-zero emissions and green hydrogen are often mentioned together these days. At present, less than 1% of the hydrogen being produced is green, and that too in demonstration projects. Globally, about 70 million tonnes (mt) of hydrogen are being produced primarily through the steam methane reformation (SMR) process — releasing, according to the International Energy Agency (IEA), 830 mt of carbon dioxide (CO_2) annually. Decarbonising the industrial sector and long-distance road transport, aviation, and shipping would be impossible unless green hydrogen is available.

Green hydrogen is difficult to produce because of several factors. First, producing each kilogram needs 50 units of power, with a 70% efficiency of electrolysers (as per an estimate by TERI). The International Renewable Energy Agency (IRENA) estimates that to achieve the Paris targets, 30% of the world's electricity use will have to be dedicated to green hydrogen by 2050; electrolyser capacity of 5,000 gigawatts (GW) would be needed. India is targeting to produce five mt of green hydrogen by 2030, and this alone would require 125 GW of renewable power. Further, we need renewable power delivered to the electrolyser through a dedicated line. One can't draw from the grid since this is expensive and has a high carbon intensity. Second, each kilogram of green hydrogen would require about nine litres of water, which could be an issue in water-deficit areas. Third, storage is a problem as hydrogen is inflammable and can escape easily. Ideally, it should be transported through pipelines over long distances (this is very capital-intensive). But, given its properties, hydrogen makes the pipelines brittle over time, leading to cracks. For short distances, transportation through trucks is a viable option. Transport by sea would require port infrastructure for storing and re-gasification. Incidentally, hydrogen can be blended with natural gas to an extent, and transported using natural gas pipelines. Fourth, hydrogen has very low density, hence it requires a large storage capacity unless the gas is converted to liquid form. Converting to liquid form would need temperatures of around 253 C below zero. All of this, again, requires a lot of energy that must be drawn from renewable sources.

Coming to the economics, green hydrogen costs $4-6/kg today — about three times the cost of grey hydrogen, made from natural gas via SMR. The two main components of the cost are electrolysers and renewable energy. There are primarily two types of electrolysers, alkaline and polymer electrolyte membrane (PEM). Though alkaline electrolysers are cheaper, PEMs have certain advantages — a smaller carbon footprint, for instance. PEMs can also be ramped up quickly to deliver hydrogen at a higher output pressure. The manufacture of PEM electrolysers, however, needs expensive catalyst materials. The cost of electrolysers can only come down when they are manufactured in bulk which, in turn, will happen only when the price of green hydrogen seems competitive vis-à-vis grey.

Somit Dasgupta

The government has earmarked ₹19,750 crore (~$2.3 billion) for the Green Hydrogen Mission. The lion's share (89%) will incentivise electrolyser manufacturing and production of green ammonia and green hydrogen. Research and development gets a mere 2% and pilot projects 7%. Green hydrogen costs $4-6/kg while grey costs $2-2.5/kg. The current incentives are unlikely to bridge the gap. These incentives should have been devised so as to bring green hydrogen's price to somewhere near grey's. The government probably should also introduce a fiat forcing certain end-users to adopt green hydrogen. But this would lead to an immediate increase in the cost of fertilisers.

In the case of electrolyser manufacturing, the incentives reduce the cost of electrolysers by barely 10%, which is not enough. Electrolyser manufacturers, after all, will need to have a back-to-back arrangement for sale to claim the incentives. The scheme is designed to support the manufacture of electrolysers totalling only 1.5 GW whereas the requirement is close to 40 GW if the 5 mt target is to be met. Besides, given how the scheme has been drafted — to illustrate, giving more weightage to "increase in indigenisation" while deciding on the winning tender — India will find it difficult to become a global hub for electrolysers. Also, this will promote the manufacture of alkaline electrolysers since PEM electrolysers need rare earth minerals that have to be imported.

The short point is the use of green hydrogen will involve considerable effort and pain and will not happen on its own steam.

Somit Dasgupta is senior visiting fellow, ICRIER. The views expressed are personal

Different approaches to AI regulation

Amid the global movement towards regulating AI systems, India's response would be crucial, with the nation currently catering to one of the largest consumer bases and labour forces for technology companies. India's path must align with its SDGs while also ensuring that economic growth is maintained

LETTER & SPIRIT

G. S. Bajpai

The Artificial Intelligence (AI) space has seen certain developments crucial to its regulation in recent years – the United Nations's Resolution on Artificial Intelligence, the AI Act by the European Parliament, laws introduced on AI in the U.K. and China and the launch of the AI mission in India. These efforts to formalise AI regulations at the global level will be critical to various sectors of governance in all other countries.

With the passing of the United Nations Resolution on Artificial Intelligence, the need and associated discourse on the regulation of AI has entered a new phase. A global acknowledgement of the risks associated with AI systems and the urgent need to promote responsible use was at the centre of the adopted resolution. It was recognised that unethical and improper use of AI systems would impede the achievement of the 2030 Sustainable Development Goals (SDGs), weakening the ongoing efforts across all three dimensions – social, environmental, and economic. Another controversial aspect mentioned in the UN resolution has been the plausible adverse impact of AI on the workforce. It would be imperative, especially for developing and least developed countries, to devise a response as the labour market in such countries is increasingly vulnerable to the use of such systems. In addition to its workforce, the impact on small and medium entrepreneurs also needs to be ascertained. Thus, being the first of its kind, the Resolution has shed light on the future implications of AI systems and the urgent need to adopt collaborative action.

The EU's approach

The EU recently passed the AI Act, the foremost law establishing rules and regulations governing AI systems. With its risk-based approach, the Act categorises systems into four categories, namely unacceptable, high, limited, and minimal risks, prescribing guidelines for each. The Act prescribes an absolute ban on applications that risk citizens' rights, including manipulation of human behaviour, emotion recognition, mass surveillance etc. While the Act allows exemptions to banned applications when it is pertinent to law enforcement, it limits the deployment by asking for prior judicial/administrative authorisation in such cases.

The landmark legislation highlights two important considerations – acknowledging the compliance burden placed on business enterprises, and start-ups, and regulating the much-deliberated Generative AI systems such as ChatGPT. These two factors warrant the immediate attention of policymakers, given their disruptive potential and the challenges of keeping pace with such evolving systems.

GETTY IMAGES

China's stand on AI

Identifying risks is evident in the approach adopted by China, which focuses on prompting AI tools and innovation with safeguards against any future harm to the nation's social and economic goals.

The country released, in phases, a regulatory framework addressing the following three issues – content moderation, which includes identification of content generated through any AI system; personal data protection, with a specific focus on the need to procure users' consent before accessing and processing their data; and algorithmic governance, with a focus on security and ethics while developing and running algorithms over any gathered dataset.

The U.K.'s framework

The U.K., on the other hand, has adopted a principled and context-based approach in its ongoing efforts to regulate AI systems. The approach requires mandatory consultations with regulatory bodies, expanding its technical know-how and expertise in better regulating complex technologies while bridging regulatory gaps, if any. The U.K. has thus, resorted to a decentralised and more soft law approach rather than opting to regulate AI systems through stringent legal rules. This is in striking contrast to the EU approach.

India's position

Amid the global movement towards regulating AI systems, India's response would be crucial, with the nation currently catering to one of the largest consumer bases and labour forces for technology companies. India will be home to over 10,000 deep tech start-ups by 2030. In this direction, a ₹10,300 crore allocation was approved for the India AI mission to further its AI ecosystem through enhanced public-private partnerships and promote the start-up ecosystem. Amongst other initiatives, the allocation would be used to deploy 10,000 Graphic Processing Units, Large Multi-Models (LMMs) and other AI-based research collaboration and efficient and innovative projects.

With its economy expanding, India's response must align with its commitment towards the SDGs while also ensuring that economic growth is maintained. This would require the judicious use of AI systems to offer solutions that could further the innovation while mitigating its risks. A gradual phase-led approach appears more suitable for India's efforts towards a fair and inclusive AI system.

The author is the Vice Chancellor, National Law University Delhi. Inputs from Priyanshi, Academic Fellow, NLU Delhi. Views are personal.

THE GIST

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IITs focus on Humanities courses to promote synergistic thinking among students

Several new courses in the humanities stream have been introduced to expand the understanding of contextual and social aspects of science

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To foster imagination among students and make them think beyond their curriculum, to contemplate human selfhood, literature and culture, rights, and politics, most Indian Institutes of Technology (IITs) are delving into courses on humanities subjects. In the decade, Humanities courses were introduced to diversify the outlook of technical students. While the Engineering/Science students at the IITs are taking Humanities courses as minors, several non-technical students are enrolling in innovative courses that include Philosophy, Indian Ancient Scripture, Art, Culture and Mythology.

"The IITs offer Humanities courses to help students understand human culture, history and society, and develop critical thinking, communication, and analytical skills. Humanities is very much part of the IIT trajectory. The humanities programmes at IITs include subjects such as Literature, Sociology, Psychology, Economics, Political Science and Anthropology among others. These programmes help students develop a holistic understanding of the world. The Department of Humanities and Social Sciences at IIT-D focuses on making a significant contribution to the world of research and education," says Prof Farhana Ibrahim, head, Department of Humanities and Social Sciences, IIT Delhi. "The IITs are a suitable place to teach humanities subjects because it houses the best brains. There will be synergistic thinking among the students from various disciplines for better educational outcomes. Apart from this, the Humanities and social sciences programme provides the students with real-life connections unlike courses such as engineering," she adds.

"The surge in Humanities courses in IITs can be attributed to a broader understanding of Science's contextual and social aspects. Scholars underscore that science is not merely a set of ideas but a practice embedded in social dynamics and diverse forms of knowledge. This holistic perspective challenges the traditional hierarchy of disciplines and promotes a more reflexive approach to knowledge," says Saumya Malviya, assistant professor, School of Humanities and Social Sciences, IIT Mandi.

IITs aim to provide a holistic education that goes beyond scientific perspectives

The interest of IITians in Humanities courses is closely linked to technology and societal dynamics. "Recognising that technology and society co-constitute each other, IITs aim to provide a holistic education that goes beyond scientific perspectives. By integrating humanities and social sciences into their curriculum, IITs equip students with a multidimensional understanding of technology's role in society," says Malviya.

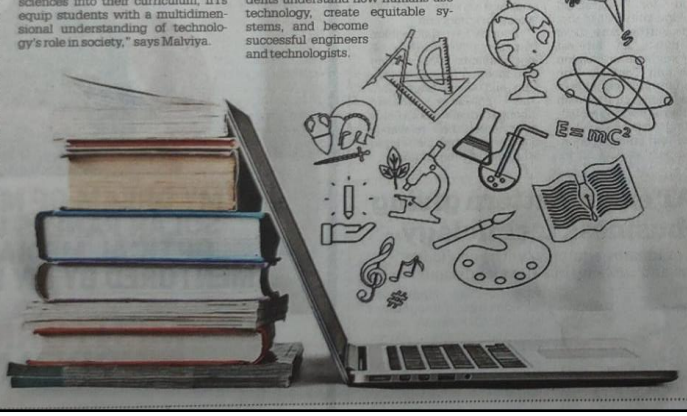
Focus on culture

Department of Humanities and Social Sciences at IIT Delhi has recently launched a new academic programme, MA in 'Culture, Society, Thought'. "The Department aims to give a unique vantage point to generate a new corpus of knowledge, populate new kinds of archives, and develop critical methodologies to give new directions to humanities and social science research from the global south. The programme offers a unique opportunity for students to explore courses across traditional disciplines. To forge new synergies in Cognitive Science and Economics, a master's programme is already offered," Prof Ibrahim added.

According to experts, creative thinking and communication skills are useful in the real world, which can only be inculcated in students through Humanities courses. Social science training can also help students understand how humans use technology, create equitable systems, and become successful engineers and technologists.

Increasing enrolment

There is a rise in technology students enrolling in humanities courses at IITs. "This trend is driven by several factors. Firstly, many students find these courses to be a refreshing departure from their prior training, offering them the opportunity to engage with new ideas and perspectives. Courses in disciplines such as History, Literature, and Economics provide students with valuable tools for critical thinking and self-reflection, empowering them to become informed and discerning citizens. As awareness of these courses spreads through word of mouth, there is a growing demand among tech students for both basic and advanced humanities courses. Additionally, these courses enable students to understand and articulate their social context, fostering a deeper appreciation for social diversity and difference. Overall, the popularity of Humanities courses among tech students highlights the growing recognition of the value of interdisciplinary education in shaping well-rounded and progressive individuals," says Prof Malviya.



Experts claim that the Humanities courses offered by IITs are different from the ones in regular colleges. Prof Malviya says, "The courses offered at IITs benefit from the interdisciplinary environment inherent to IITs. It allows genuine and meaningful interdisciplinary engagement rather than mere juxtaposition of disciplines. Additionally, these courses are open to undergraduates as well. Several undergraduate students enrol in these courses out of curiosity, contributing to a diverse and dynamic learning environment. The active participation of young undergraduates also challenges course instructors to innovate in terms of structure and delivery, further enhancing the interdisciplinary nature of these courses."

Prof Rajesh Kumar, head, Department of Humanities and Social Sciences, IIT Madras, says, "The Humanities courses in IIT Madras are designed with the view that the future needs socially responsible professionals. Engineers with arts and humanities backgrounds are expected to address the challenges of understanding technology and human requirements. Future professionals must have a human connect to ensure that technology is human friendly." IIT Madras' Department of Humanities and Social Sciences has seen a significant increase in student enrolment in recent years. "IIT-M offers subjects such as Development Studies and Technology and Policies aiming to foster the knowledge of development and societal aspects of technology among students and why they are applied," says Prof Kumar.

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KIET (R&D) Policies

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

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

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

CV Raman Award Policy

Eligibility Criteria for CV Raman Award for the Academic Session 2023-24

1. The Faculty Members contribution **in at least three categories** /attributes out of the below mentioned categories (**A, B, C, D, & E**) of the CV Raman Award Nomination form is mandatory for the consideration of CV Raman Award -

A (i). Papers Published in Indexed journals- SCI/SCI-E/SSCI/ESCI as 1st Author with KIET Affiliation

A (ii). Papers Published in Indexed journals- SCOPUS as 1st Author with KIET Affiliation

A (iii). Full Papers published in Scopus Indexed International Conference Proceedings (Scopus Indexed International conference in association with IEEE/ Springer/ Elsevier/ ACM/ Wiley/ IPC etc. or organized by reputed Institutions (IIT/IISc/NIT/IIIT/JNU/Central Universities) as 1st Author with KIET Affiliation

B (i). Technology Patent Indian/International (1st applicant / 1st Inventor when KIET is the main applicant) (Patent Granted)

B (ii). Technology Patent Indian/International (1st applicant / 1st Inventor when KIET is the main applicant) (Patent Published)

B (iii). Completed Research outcomes: Design/Industrial Design: Design Patent Indian (1st applicant / 1st Inventor when KIET is the main applicant)

C. Ongoing /Completed Research projects and consultancies.

D (i). Research Guidance (Ph.D. Guiding) (Supervisor/ Co-Supervisor)

D (ii). Research Guidance (Ph.D. Submitted) (Supervisor/ Co-Supervisor)

D (iii). Research Guidance (Ph.D. Awarded) (Supervisor/ Co-Supervisor)

E. Citation (Publon for SCI and SCOPUS database for SCOPUS journals)

2. Individuals who have received this award will regain eligibility after a period of two years. For instance, a recipient of the award during the 2022-23 academic session would next be eligible to apply in the 2025-26 academic session.

Rules for Finalization of Merit List for CV Raman Award

1. The nominations will be invited by HR from Professors, Associate Professors and Assistant Professors (except Deans and HoDs).

2. The research credentials **for the last two years shall be considered for finalizing the merit list**. (For example, for CV Raman award, Session 2023-24, research credentials for session 2022-23 and 2023-24 shall be considered). Number of citations to be calculated for last two calendar years (For example, for CV Raman award, Session 2023-24, citations for calendar year 2022 and 2023 need to be considered).

3. The merit list shall be prepared keeping in view that 70% of awardees are from Engineering, Applied Sciences and humanities departments, 20% of the awardees are from the Pharmacy department, 5% of the awardees are from MBA Department and 5% of the awardees are from MCA department.

4. All Faculty Members Should Claim only those Research credential in CV Raman Award in all categories in which Affiliation 'KIET Group of Institutions, Delhi -NCR, Ghaziabad' is mentioned.

5. The list of shortlisted candidates will be submitted by the Screening Committee to the Director. The Screening Committee comprises of Dean (R&D), Associate Deans (R&D) and Assistant Deans (R&D). The Screening Committee will check and re-verify all the credentials of nominated faculty members through an online process.

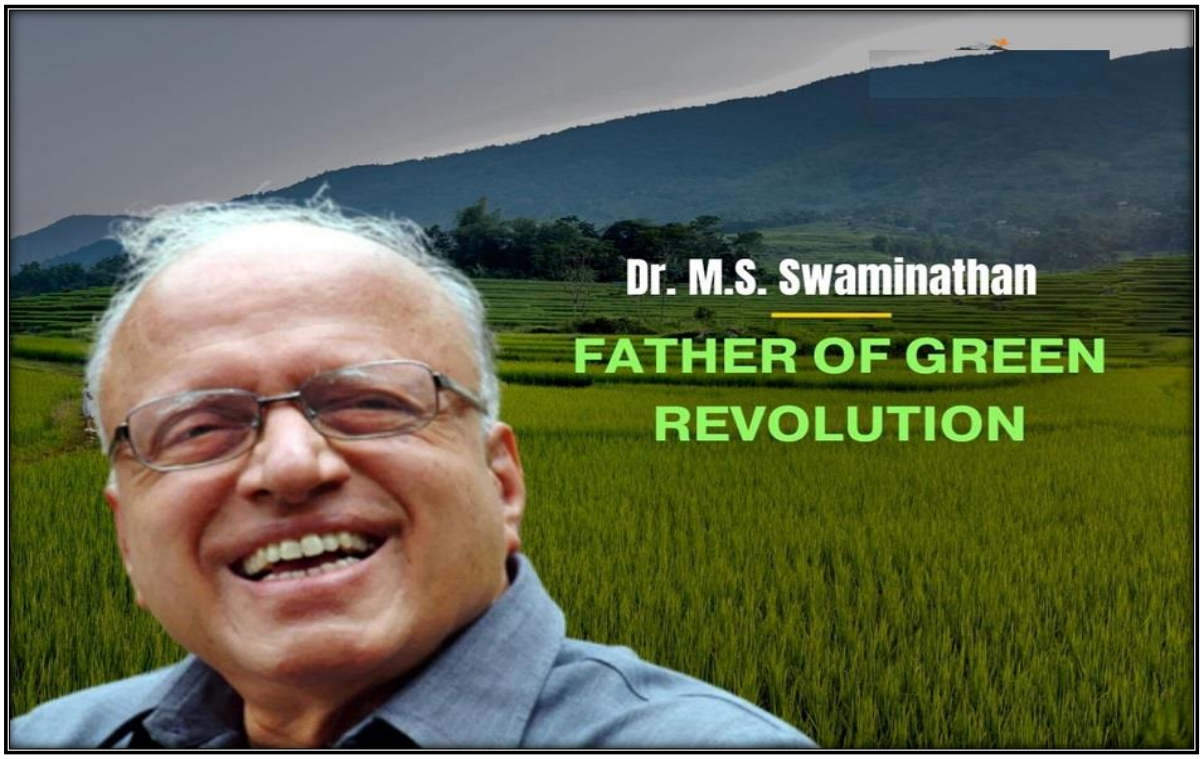
6. Dean (R&D) will submit the final list duly approved by Honorable Director to Head HR for further action.

7. The award will be given on 5th September (Teacher's Day).

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


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



Mankombu Sambasivan Swaminathan (7 August 1925 – 28 September 2023) was an Indian **agronomist, agricultural scientist, geneticist, administrator, humanitarian**.

Worldwide, the father of the Green Revolution was American agronomist Norman Borlaug; in India, the honour is bestowed on Swaminathan, for his pioneering role in this field.

In 1979, he was appointed the Principal Secretary of the Agriculture Ministry of the Indian government. From 1981 – 85, he was Independent Chairman of the **Food and Agriculture Organisation (FAO)**. From 1984 – 90, he was the **President of the IUCN** (International Union for Conservation of Nature and Natural Resources). From 1988 – 96, he was the President of the World Wide Fund for Nature–India.

In 2001, he was Chairman, Regional Steering Committee for the India – Bangladesh joint Project on Biodiversity Management in the Sundarbans World Heritage Site.

He received the **Shanti Swarup Bhatnagar Award** in 1961 for biological sciences. The GOI bestowed the **Padma Vibhushan** on Swaminathan in 1989.

In 1971, he received the **Ramon Magsaysay Award** for Community Leadership. He also received the **UNESCO** Mahatma Gandhi Gold Medal in 1999.

In February 2024, the Government of India announced the Bharat Ratna for Dr Swaminathan in honour of his great achievements and contribution towards making India self-reliant in food grain production.

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