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# अनुसंधान

(KIET Research Magazine)

**Dr. Asheesh Kumar Singh**  
**Professor**  
**MNNIT Allahabad, Prayagraj**  
**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](http://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 88<sup>th</sup> 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.



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

## CONTENTS

S.No.	Details	Page No.
1.	KIET-A Glance	1
2.	Editorial Board	2
3.	KIET Research & Development Committee	2
4.	KIET Collaborative Research and Development Committee	3
5.	Departmental Research Committee	4
6.	Message from Face of the Cover Page	6
7.	Message from Chief Patron	7
8.	Message from Patron	8 – 9
9.	Message from Editor-In-Chief	10
10.	Foreword	11-12
11.	Overview of the Research and Development	13
12.	Glimpse of Month	14-17
13.	Statistics of KIET Research and Development Activities	18-20
14.	Patent Published in the Month	21-30
15.	Details of Research Incentives for Journal Articles	30-34
16.	Details of Research Incentives for Conference Articles	34-36
17.	Innovation Spotlight of the Month	37-40
18.	KIET Research and Development Policies	41-44
19.	Patents Granted	45-46
20.	Various Research Labs in KIET	47-48

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## Message from the Face of Cover Page



Dear Colleagues,

Heartiest congratulations to the KIET Group of Institutions on the significant achievement of publishing your Research Magazine “अनुसंधान. This milestone is a clear reflection of your unwavering dedication and commitment towards advancing knowledge and fostering innovation in research and development.

I want to express my deep admiration and celebrate the remarkable achievements of the KIET Group of Institutions. Their contributions have shaped the future landscape of scientific inquiry and technological advancement and set a high standard for research and development endeavours.

As we tackle the challenges presented by climate change, I advocate for educational institutions like ours to synchronise our research and development endeavours with national objectives. With India's ambitious goal of achieving net zero emissions by 2070, we must channel our efforts towards collectively pursuing sustainable solutions.

India's energy-mix strategies highlight the pressing necessity for transitioning to clean energy options, enhancing manufacturing capabilities, optimising energy efficiency, and implementing a unified policy for hydrogen adoption. By focusing our research efforts on these domains, we can make substantial contributions to the nation's sustainability goals.

Furthermore, I'm thrilled to highlight the immense potential for collaborative research between KIET and MNNIT, as outlined in our Memorandum of Understanding (MoU). This partnership offers a robust framework for our resources, expertise, and knowledge to tackle complex research challenges. By working together, we can embark on a journey of discovery and innovation, leading to transformative outcomes for both society and the environment.

Once again, I convey my best wishes to KIET for your upcoming endeavours in research and development. May our efforts inspire and motivate positive change in the scientific community.

Warm regards,

**Dr. Asheesh Kumar Singh**

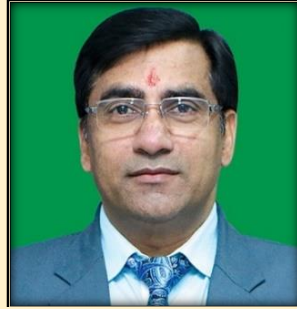
SMIEEE, LMISTE, LMSSI, FIE(I), FIETE

Professor

Department of Electrical Engineering

MNNIT Allahabad, Prayagraj

## 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

### Signing MOU Between KSOP, KIET and Indian Pharmaceutical Association-Delhi



We're excited to announce the successful hosting of an Expert Lecture Series and MoU Signing Ceremony between the KIET School of Pharmacy, KIET Group of Institutions, located in Delhi-NCR, India, and the Indian Pharmaceutical Association-Delhi State Branch, on February 24, 2024.

This partnership aims to enhance academic and professional development, fostering cooperation and contributing to the growth of the pharmaceutical sector. The MoU outlines objectives such as promoting research, facilitating workshops and seminars, providing internship opportunities, and developing industry-relevant curriculum.

The official signing symbolized our commitment to collaboration, with both parties exchanging tokens of appreciation. This sets the stage for future initiatives, including joint research projects, faculty exchange programs, and collaborative events enriching the learning experience for students and professionals.

The event concluded with a networking session, facilitating discussions on potential collaborations. This MoU signifies the beginning of a fruitful partnership, advancing pharmacy education and the pharmaceutical industry.

### **Signing MoU between Mitsubishi and ECE Department, KIET**





On Feb 22, 2024, KIET Group of Institutions took a monumental step forward with the inauguration of the Center of Excellence (CoE) dedicated to Power Semiconductor Devices, as part of our CSR initiative.

This momentous occasion was marked by the signing of a crucial Memorandum of Understanding (MoU) with Mitsubishi and the Electronics & Communication Engineering Department of KIET, ushering in a new era of academic-industry collaboration.

### **The Hackers Meetup, KIET Chapter**



A buzzing crowd of 80 cybersecurity enthusiasts filled the room at KIET Group of Institutions for The Hackers Meetup, KIET Chapter, on February 2nd, 2024, organised by the Department of Computer Science and Information Technology!

Renowned speakers, Mr. Sahil Sharma and Mr. Soumak Roy, captivated the audience with their insights on navigating the field and dark web, while 6 industry mentors - Mr. Amit S, Mr. Sanchay Singh, Mr. Pankaj Yadav, Ms. Kashish Huma Hashim, Mr. Pritam Malik, and Mr. Abhishrey Gupta - offered invaluable guidance and inspiration.

## Session on Role of Innovation and Entrepreneurship in Today's Education Ecosystem







The Electrical and Electronics Engineering department organized an enlightening session with Mr. Ish Anand, an esteemed Entrepreneur, Board Member, and Cross-Border Growth & Scale Thought Leader with a presence in India & UAE. The event took place on January 30, 2024, and the topic was "The Role of Innovation and Entrepreneurship in Today's Education Ecosystem."

Mr. Anand shared valuable insights about the significance of new ideas and starting businesses in today's education system. It was a great opportunity to learn and understand more about the connection between education and entrepreneurship.

## Statistics of KIET Research and Development Activities

### Rankings & Accreditations

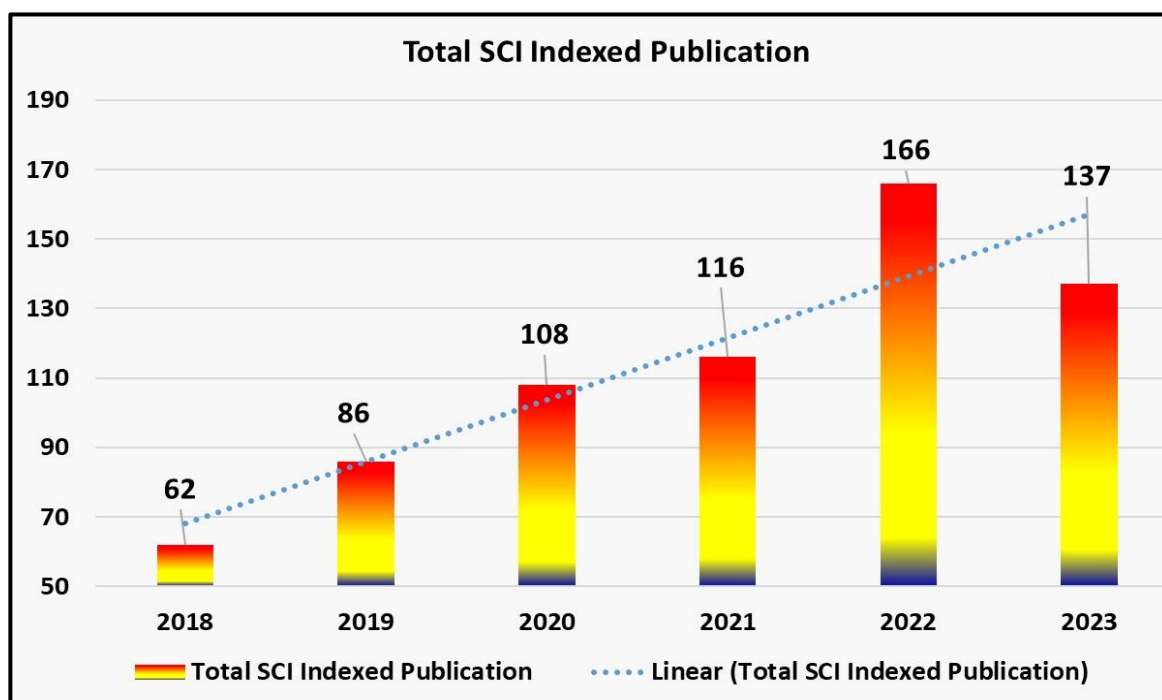
- NAAC - Grade 'A+' (Cycle 2 Assessment) - Accredited for 5 years till 03 Jan 2027.
- NIRF 2023 (Pharmacy – Rank 88 & Engineering - Rank Band (151-200)).
- NIRF 2023 Innovation Rank Band (51-100).
- QS-IGAUGE - 'Diamond' College Rating (till Feb 2024) & 'Institution of Happiness' Award.
- Innovation 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)

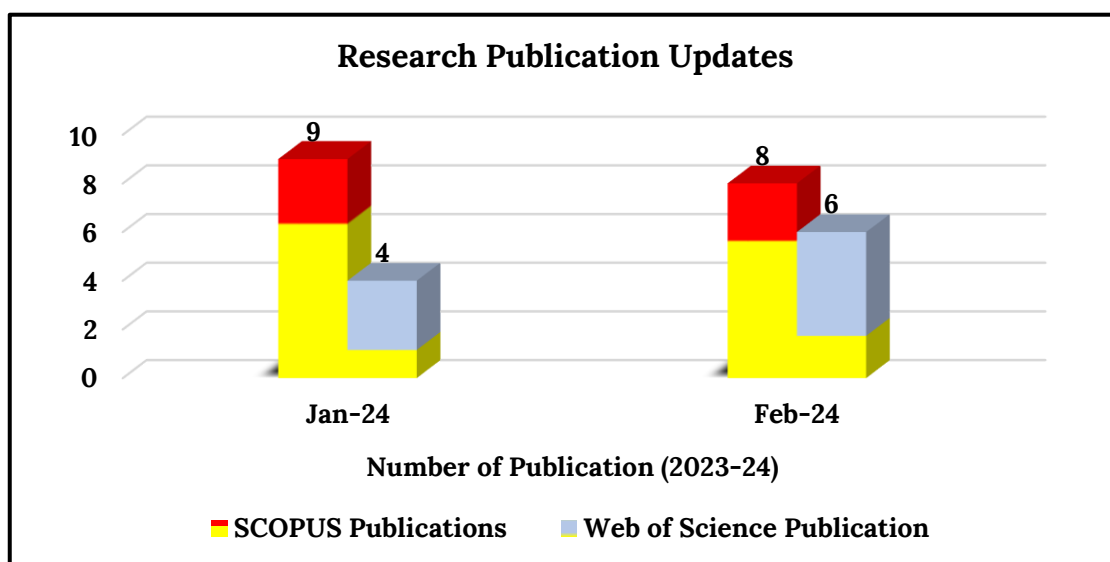
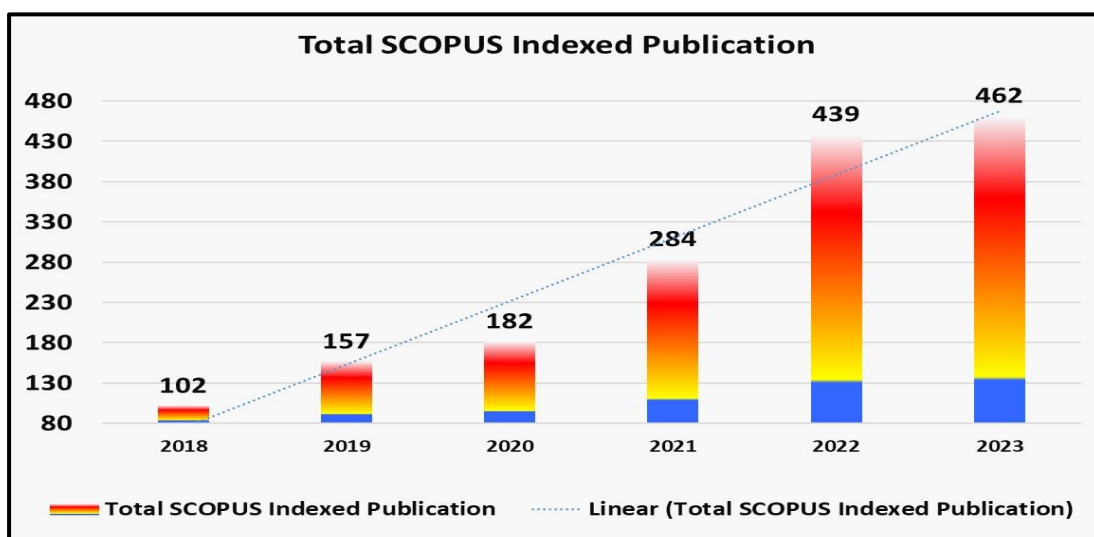
 <p>सूचना का अधिकार RIGHT TO INFORMATION</p>	<p>दूरभाष/TEL : 26962819, 26567373 (EPABX) : 26565694, 26562133 : 26565687, 26562144 : 26562134, 26562122 फैक्स/FAX : 26960629, 26529745 Website : <a href="http://www.dsir.gov.in">http://www.dsir.gov.in</a> (आयुर्विज्ञान 9001:2008 प्रमाणित विभाग) (AN ISO 9001:2008 CERTIFIED DEPARTMENT)</p>	 <p>सत्यमेव जयते</p>	<p>भारत सरकार विज्ञान और प्रौद्योगिकी मंत्रालय वैज्ञानिक और औद्योगिक अनुसंधान विभाग टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली - 110016 GOVERNMENT OF INDIA MINISTRY OF SCIENCE AND TECHNOLOGY Department of Scientific and Industrial Research Technology Bhavan, New Mehrauli Road, New Delhi - 110016</p>
			
F.No. 11/791/2018-TU-V		Date: 28 <sup>th</sup> April 2022	
<p>The Vice Chairman Krishna Charitable Society, 13 KM Stone, Ghaziabad-Meerut Road, Ghaziabad – 201206, Uttar Pradesh</p>			
<p>Subject: Renewal of Recognition of Scientific and Industrial Research Organisations (SIROs).</p>			
<p>Dear Sir,</p>			
<p>This has reference to your application for renewal of recognition of <b>Krishna Charitable Society, Ghaziabad, Uttar Pradesh</b> 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.</p>			
<p>2. This is to inform you that it has been decided to accord renewal of recognition to <b>Krishna Charitable Society, Ghaziabad, Uttar Pradesh</b> from <b>01.04.2022</b> to <b>31.03.2025</b>. The recognition is subject to terms and conditions mentioned overleaf.</p>			
<p>3. Receipt of this letter may kindly be acknowledged.</p>			
			<p>Yours faithfully,  (Dr. P.K. Dutta) Scientist - 'F'</p>

### 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 February 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	10 (upto Feb)	17 (upto Feb)	27
<b>Total</b>	<b>679</b>	<b>1638</b>	<b>2317</b>





Category	Number of Publication for January 2024	Number of Publication for February 2024
SCOPUS Publications	9	8
Web of Science Publication	4	6

## Details of Patents Published/Granted

### **Title of the Invention: Silent-Speak: A Machine Learning-Based Model for Individuals with Hearing and Speech Impairments**

**Application Number:** 202411002016 A (Indian Patent Office)

**Applicant(S):** VIKAS KAMRA AND TEAM-KIET GROUP OF INSTITUTIONS (CS)

**Date of Filing:** 10-01-2024

**Date of Publishing:** 02-02-2024

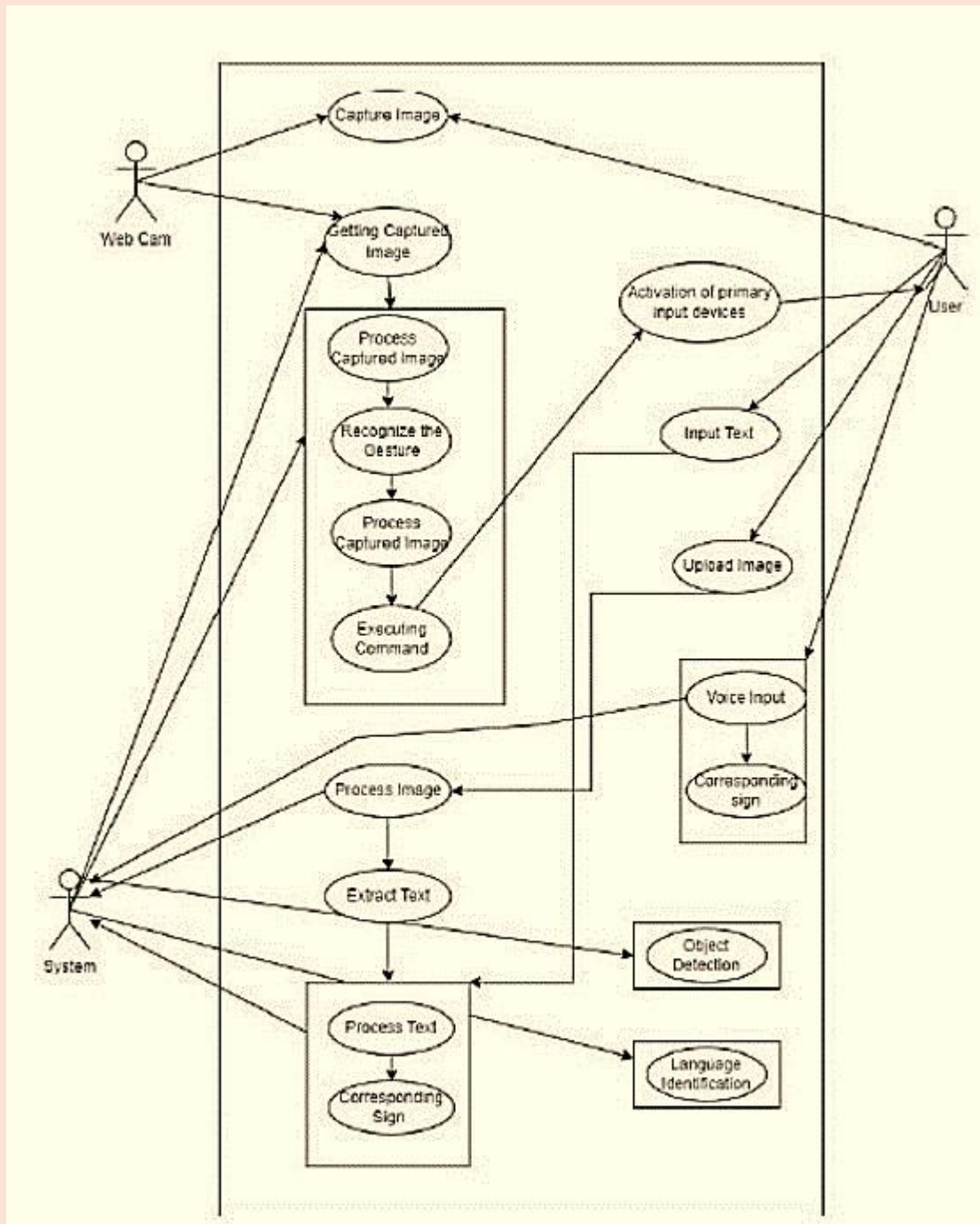
**Field of the Invention:** The present invention falls within the realm of Computer Science and machine learning field. This innovation refers to mobile application; facilitate communication for individuals who are deaf and mute. Moreover, it serves as a valuable resource for individuals with normal hearing, aiding in their comprehension of sign language. This development represents a crucial stride towards bridging the communication gap that exists between those with hearing and speech impairments and the general population. The Silent Speech app is equipped with features enabling the conversion of text to sign, image to sign, voice to sign, and sign to text additionally with two more features object detection and language identification.

**Objects of the Invention:** The objectives of the present disclosure include:

- Providing assistance to individuals facing challenges with speaking and hearing, offering features for converting signs to text, signs to images, signs to voices, and signs to text in images.
- Enabling individuals with speech difficulties to easily translate their hand gestures into appropriate text through sign language.
  - Offering functionality for speech to sign communication, aiding users in understanding the symbols corresponding to spoken words or sentences.
- Allowing users to comprehend the meaning of text within an image, such as quotes, by transforming it into equivalent sign language.
- Serving as a guide for individuals without impairments to familiarize themselves with sign language and learn its principles.

**Summary of the Invention:** The sign language detection and translation model represent a transformative leap in communication technology, particularly tailored to empower individuals with speech and hearing impairments. Offering a comprehensive suite of features, the model seamlessly translates text, images, and voice into sign language, providing real-time communication enriched with dynamic animations for enhanced comprehension. The integration of object detection extends the model's utility beyond communication scenarios, fostering immersive real-world interactions.

The model's language adaptability ensures global relevance, catering to diverse linguistic contexts and making it accessible to users worldwide. Simultaneously, its role as an educational resource contributes to broader awareness and inclusivity, allowing individuals without impairments to learn and understand sign language.



**Figure 1:** Illustrates Algorithm Process Flowchart

**Title of the Invention:** Comprehensive Compensation Prediction System

**Application Number:** 202311087997 A (Indian Patent Office)

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

**Date of Filing:** 22-12-2023

**Date of Publishing:** 23-02-2024

**Field of the Invention:** The present invention relates to the field of Human Resources (HR) and predictive analytics. Specifically, it pertains to systems and methods for predicting and determining compensation structures for employees within an organization. The technical field encompasses the integration of fuzzy logic-based performance evaluation and regression analysis to create a context-aware and comprehensive compensation prediction system.

**Summary:** The present invention relates to the field of Human Resources (HR) and predictive analytics. Specifically, it pertains to systems and methods for predicting and determining compensation structures for employees within an organization.

The technical field encompasses the integration of fuzzy logic-based performance evaluation and regression analysis to create a context-aware and comprehensive compensation prediction system.

The comprehensive compensation prediction system includes a data collection module configured to gather historical compensation data from diverse sources within an organization, including employee payroll records, performance metrics, market salary surveys, and industry benchmarks, a data analysis module employing machine learning algorithms to process the collected historical compensation data and identify patterns, trends, and correlations among various factors influencing compensation, a predictive modeling module that utilizes the processed historical compensation data and current employee-related variables to forecast and predict future compensation trends and potential salary adjustments within the organization, and a user interface module enabling stakeholders to interact with the system, visualize prediction results, and receive forecasts based on the analysis of compensation data.

**Title Of The Invention: Iot Enabled Smart Hr Recruiting And Assessment System**

**Application Number:** 202311087899 A (Indian Patent Office)

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

**Date Of Filing:** 22-12-2023

**Date Of Publishing:** 23-02-2024

**Field Of The Invention:** The present invention relates to the field of Human Resource Management (HRM) and more specifically to an IoT-enabled Smart HR Recruiting and Assessment Platform. This platform integrates advanced technology to streamline and enhance the recruiting and assessment processes within the HRM domain.

**Objective Of The Invention:** The principal object of the present invention is to overcome the disadvantages of the prior art.

Another object of the present invention is to provide an IoT enabled smart HR recruiting and assessment system. Another object of the present invention is to integrate the advanced technologies such as artificial intelligence, biometric assessments, and predictive analytics within the recruitment and assessment process is at the heart of this innovation. Another object of the present invention is to mitigate biases, enhances accuracy, and significantly expedites the hiring process.

Another object of the present invention is to provide an elegant, reliable and precise approach towards the IoT enabled smart HR recruiting and assessment system.

Yet another object of the present invention is to provide a process of improving functionalities of the IoT enabled smart HR recruiting and assessment system.



**Summary of the Invention:** The present invention relates to the field of Human Resource Management (HRM) and more specifically to an IoT-enabled Smart HR Recruiting and Assessment Platform. This platform integrates advanced technology to streamline and enhance the recruiting and assessment processes within the HRM domain.

The smart HR recruiting and assessment platform includes an AI powered interview bot configured to conduct initial job interviews with candidates and analyze candidate responses in real-time based on language, tone, and content, a biometric candidate assessment module incorporating specialized hardware with facial recognition technology for capturing and analyzing candidate facial expressions and body language during video interviews, a skill and personality assessments module administered through software tools for comprehensive profiling of candidates, an automated reference checking module that collects and analyzes data from various sources, including publicly available information and social media profiles related to the candidate, a candidate matching module to match candidate profiles with job requirements, considering a combination of hard skills, soft skills, cultural fit, and assessment results; a predictive analytics module that employs historical data and artificial intelligence techniques to predict candidate success and retention within the organization; and a data-driven hiring decisions module generating detailed reports and insights for HR professionals to make informed, data-driven hiring decisions.

**Title of the Invention: Formulation And Development Of Patch Formulation Incorporating Bisoprolol**

**Application Number:** 202311088762 A (Indian Patent Office)

**Applicant(S):** Dr. N.G. Raghavendra Rao (KSOP)

**Date of Filing:** 26-12-2023

**Date of Publishing:** 23-02-2024

**Field of the Invention:** The present invention relates to the formulation and development of a transdermal patch incorporating bisoprolol. The patch aims to provide a controlled and sustained release of bisoprolol, offering an efficient and convenient method for administering this beta-blocker medication

**Objects of the Invention:** Some of the objects of the present disclosure, which at least one embodiment herein satisfies, are as follows. It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative. An object of the present disclosure is to develop a transdermal patch to improve the bioavailability of bisoprolol, ensuring a more predictable and consistent absorption profile. Another object of the present disclosure is to achieve a controlled and sustained release of bisoprolol over an extended period, optimizing therapeutic outcomes while minimizing fluctuations in drug levels.

Still another object of the present disclosure is to mitigate systemic side effects associated with oral administration by delivering bisoprolol through the skin, thereby improving patient tolerance and compliance.

Another object of the present disclosure is to provide for a convenient and user-friendly alternative to oral medication

**Summary:** The following presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the present invention. It is not intended to identify the key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concept of the invention in a simplified form as prelude to a more detailed description of the invention presented later.

The present invention is generally directed to the development and formulation of Bisoprolol transdermal patch, containing 5 mg of the active ingredient, formulated with a Polyvinyl Alcohol matrix for controlled release.

**Title of the Invention: Dynamic Organizational Structure Optimization System Using Blockchain and IoT Devices**

**Application Number:** 202311087996 A (Indian Patent Office)

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

**Date of Filing:** 22-12-2023

**Date of Publishing:** 23-02-2024

**Field of the Invention:** The present invention relates to the field of organizational optimization. Specifically, it combines the use of Internet of Things (IoT) devices and Blockchain technology to develop a Dynamic Organizational Structure Optimization System. This system focuses on enhancing the efficiency, adaptability, and responsiveness of organizations by continuously collecting, processing, and analysing real-time data from various sources within the organization and using it to drive optimization recommendations.

**Objects of the Invention:** The principal object of the present invention is to overcome the disadvantages of the prior art.

Another object of the present invention is to provide a dynamic organizational structure optimization system using block chain and IoT devices.

Another object of the present invention is to ensure responsible resource management and recording these conditions on the Blockchain.

Another object of the present invention is to scale seamlessly as the organization grows, with scalability milestones and testing results securely recorded on the Blockchain.

Another object of the present invention is to provide an elegant, reliable and precise approach towards the dynamic organizational structure optimization system using block chain and IoT devices.

Yet another object of the present invention is to provide a process of improving functionalities of the dynamic organizational structure optimization system using block chain and IoT devices.

**Summary of the Invention:** The present invention relates to the field of organizational optimization. Specifically, it combines the use of Internet of Things (IoT) devices and Blockchain technology to develop a Dynamic Organizational Structure Optimization System.

This system focuses on enhancing the efficiency, adaptability, and responsiveness of organizations by continuously collecting, processing, and analyzing real-time data from various sources within the organization and using it to drive optimization recommendations.

The system for continuous organizational optimization, includes a plurality of Internet of Things (IoT) devices for real-time data collection from various sources within an organization, including project management, communication, and performance metrics, a data pre-processing module configured to cleanse, transform, and organize collected data to ensure data uniformity and accuracy, a data analysis module for scrutinizing performance metrics and communication patterns to identify areas for organizational improvement, a predictive modeling module that utilizes historical data and realtime data from IoT devices to forecast future workloads and anticipate organizational growth, an optimization recommendation module that generates recommendations for organizational enhancements based on insights from data analysis and predictive modeling, an implementation module that adjusts the organizational structure based on the generated recommendations, a continuous monitoring and feedback module that actively collects feedback from organizational stakeholders and tracks the impact of implemented changes, an exception handling module designed to gracefully handle unexpected challenges during the optimization process, and a stopping conditions module providing control to halt optimization when predefined goals are achieved or when resource limits are reached.

### PATENTS Published – February 2024

S. No.	Title Of Patent	Dept.	Name Of Applicant	Date Of Publication	Status
1.	Silent-Speak: A Machine Learning-Based Model for Individuals with Hearing And Speech Impairments	CS	Pardeep Tyagi, Taniya Singh, Shitiz Rajvanshi, Shubham Goel, Amit Kumar Singh Sanger, Rahul Kumar, Shreela Pareek, Vishakha Chauhan, Dr. Vikas Kamra	02-02-2024	PUBLISHED
2.	Adaptive Online Platform for Enhanced	CS	Himanshu Kumar, Amod Katiyar, Aniket Bhardwaj,	02-02-2024	PUBLISHED

	Teaching and Learning		Gaurav Dubey, Harsh Khatter		
3.	Solarnanocoat: Ultra-Thin Photovoltaic Coating for Enhanced Solar Panel Efficiency	CS	Anurag Mishra	02-02-2024	PUBLISHED
4.	Intelligent Attendance Tracking System: A Comprehensive Approach for Automated Attendance Marking	CS	Sparsh Verma, Shaurya Awasthi, Tushar Sharma	02-02-2024	PUBLISHED
5.	System And Method for Neural Style Transfer For 3d Model	CS	Akash Goel, Palak Singh , Ragini Rani , Kalash Jain , Harsh khatter	02-02-2024	PUBLISHED
6.	Intelligent Web Services: Empowering User Experiences Through Machine Learning	CS	Anurag Mishra	02-02-2024	PUBLISHED
7.	Artificial Intelligence Based Data Management System	KSOM	Prerana Taylor	02-02-2024	PUBLISHED
8.	System And Method for Blood Infection Detection Using Fuzzy Based System	CS	Harsh khatter	09-02-2024	PUBLISHED
9.	A Novel Framework for Safety-Critical Decision-Making and Control Using Machine Learning	CSIT	Ambrish Gangal	09-02-2024	PUBLISHED
10.	Method And System for Blockchain-Based Product Validation	CS	Shivani, Abhishek Singh Yadav , Aditi Batra , Anurag Tripathi , Kshitij Pal, Garima Singh	09-02-2024	PUBLISHED
11.	Intelligent Waste Management System Using Drones with IoT and GPS Enabled Technologies	CS	Harsh khatter	16-02-2024	PUBLISHED
12.	System And Method for Pcos Detection And Prediction	CS	Harsh khatter, Mr. Pawan Kumar Pal , Pooja Kumari , Aditi	16-02-2024	PUBLISHED

			Singh , Kirti Jayant , Dr. Harsh Khatter		
13.	Skin N Sense: A Comprehensive Health Monitoring System	CS	Mr. Pawan Kumar Pal, Tryamb Sachan, Suryansh Awasthi, Shivam Singh, Dr. Harsh Khatter	16-02-2024	PUBLISHED
14.	System And Method for Traffic Sign Recognition Using CNN	CS	Mr. Pawan Kumar Pal, Asish, Prashant Gupta, Anubhav Kumar, Dr. Harsh Khatter	16-02-2024	PUBLISHED
15.	Integrated Machine Learning-Assisted System and Method for Efficient Image Filtering On FPGA: Unifying Linear And Morphological Types for Enhanced Image Processing	CSE	Dr. Parita Jain	16-02-2024	PUBLISHED
16.	Ai-Driven Optimization for Green Computing	CS	Gaurav Dubey	16-02-2024	PUBLISHED
17.	Psycho-Adaptive Neural Network for Scalable Integration of Visual Working Memory with Natural Image Processing	CS	Gaurav Dubey	16-02-2024	PUBLISHED
18.	Comprehensive Compensation Prediction System	CS (AI)	KIET Group of Institutions, Richa Singh, Gargi Singh	23-02-2024	PUBLISHED
19.	IoT Enabled Smart Hr Recruiting and Assessment System	CS (AI)	KIET Group of Institutions, Dr. Rekha Kashyap, Sayani Ghosal	23-02-2024	PUBLISHED
20.	System and Method for No sql to RDBMS Converter	CS	Vageesha Rai, Vikas Kumar Verma, Saumya Singh, Abhishek Goyal, Harsh Khatter	23-02-2024	PUBLISHED

21.	System and Method for Blind Image Restoration and Data Augmentation	CS	Avishi Tayal, Nandini Tyagi, Piyush Gupta, Harsh Khatter	23-02-2024	PUBLISHED
22.	Friction Stir Welding (Fsw) as a Solid-State Joining Process to Join Two Facing Workpieces	ME	Kuldeep Singh	23-02-2024	PUBLISHED
23.	Emomelody Mapper- Emotion Based Music Player	CS	Arti Sharma, Shruti Jain, Unnati Tandon, Shubhangi Rai, Saurabh	23-02-2024	PUBLISHED
24.	Formulation And Development of Patch Formulation Incorporating Bisoprolol	KSOP	Dr.N.G.Raghavendra Rao	23-02-2024	PUBLISHED
25.	Blockchain-Enabled Virtual Voting System with Enhanced Security and Accessibility Features for Decentralized Electoral Infrastructure	CS	Akanksha, Utkarsh Mishra, Surya Pratap Singh, Adrika Tripathi, Anurag Tewari, Ila Kaushik , Sherish Johri , Dr. Vikas Kamra	23-02-2024	PUBLISHED
26.	Real-Time Driver Facial Gesture Identification Using Ml	CS	Anurag Mishra, Sarthak tyagi, Utkarsh mishra, Shruti Gupta, Puneet Kumar Goyal	23-02-2024	PUBLISHED
27.	Implementation Of AI in Financial Sectors	KSOM	Dr. Reenu, Dr. Komal Sharma , Dr. Namrata Tripathi	23-02-2024	PUBLISHED
28.	Dynamic Organizational Structure Optimization System Using Blockchain and IoT Devices	CSIT	KIET Group of Institutions, Dr. Deepak Singh, Dr. Ankur Garg	23-02-2024	PUBLISHED

29.	Device to Detect Lung Cancer	KSOP	Mr. Pankaj	09-02-2024	REGISTRATION OF DESIGN
30.	Low Noise Microwave Synthesizer for Sequential Reactions	KSOP	Dr. Smriti Sahu	16-02-2024	REGISTRATION OF DESIGN
31.	Organic-Inspired Drug Vial Set	KSOP	Sakshi Garg	16-02-2024	REGISTRATION OF DESIGN
32.	Secure Decentralized Healthcare System for India	KSOP	Dr. K. Nagarajan	08.02.2024	GRANTED
33.	System & Method for A Safety Helmet	MCA	Ankit Verma	28.02.2024	GRANTED

### Details of Research Incentives for Journals

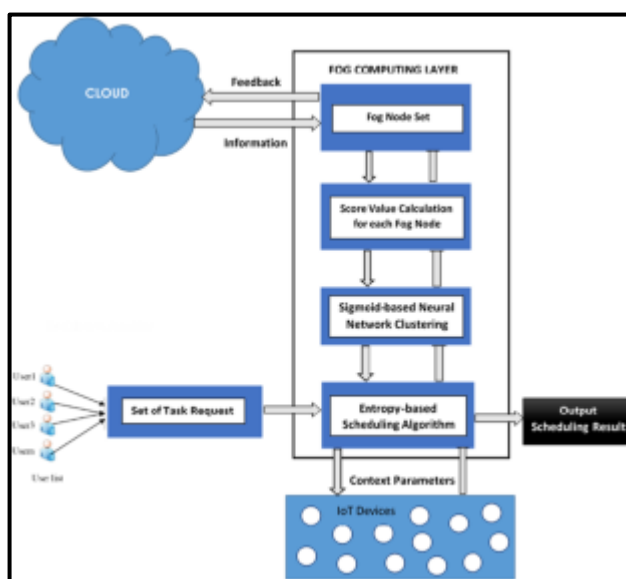
S. No.	Name of Faculty	Designation	Dept.	Title of Paper and Name of Journal	Impact Factor/Cite Score	Benefits/Incentives	Index in Journal
1.	Saurabh	Assistant Professor	IT	Enhance Qos with fog Computing based on sigmoid NN clustering and entropy - based scheduling	3.6	11,000	SCIE/Springer
2.	Roma Ghai	Professor	KSOP	An Investigate Study of Medicinal Herbs for Anti - Obesity Potential: (A Review)	-	2,000	ESCI
3.	Vineet Sharma	Professor & HoD	CSE	Detection and Prediction of Breast Cancer Using Improver Faster Regional Convolutional Neural Network Based on Multilayer Perceptron's Network	-	2,000	ESCI
4.	Ajay Kumar	Assistant Professor	IT	Evaluation Of Machine Learning Techniques	2.0	11,000	SCIE

				For Heart Disease Prediction Using Multi - Criteria Decision Making			
5.	Shubham Shukla	Associate Professor	ECE	WhoopH: whale optimization - based optimal placement of hunode within a WBAN	4.6	25,000	SCI

### Highlights of the Published Journal Articles

1. **Saurabh, Dhanaraj, R.K. Enhance QoS with fog computing based on sigmoid NN clustering and entropy-based scheduling. *Multimed Tools Appl* 83, 305–326 (2024). <https://doi.org/10.1007/s11042-023-15685-3>**

The exponential expansion in the number of smart devices in the burgeoning Internet of Things (IoT) is driving the growing demand for effective storage techniques. Cloud computing has shown to be an excellent alternative for storing and processing enormous amounts of data thus far. Cloud computing, on the other hand, is predicted to be unable to successfully handle a significant number of IoT devices in the coming years due to bandwidth constraints. Fog computing is a novel technology that is supposed to solve many of the problems associated with large-scale networks on the Internet of Things. Fog computing brings high-quality cloud services closer to mobile users. To overcome all the existing drawbacks, this study improves QoS using fog computing based on Sigmoid Neural Network Clustering (SNNC) and Entropy-Based Scheduling (EBS). The work of the IoT sensors is to collect all the data and send them to the fog computing tier. After that, fog computing performs score value calculation for each fog node based on SNNC as well as EBS. Here, the data and information collected by the edge devices are analyzed in this tier. Cloud Computing manages the various actions that are to be performed by the system. A component of the monitoring runs on the sensors which enable the sensors to collect data and send it to the fog layer also the cloud computing tier constantly supervises the system. The experimental results QoS show that our proposed strategy outperforms the traditional method.



2. **Ghai R, Chaudhary S, Nagarajan K, Goel R, Mishra S. K, Tholia N. K, Ali N, Kaurav M. An Investigative Study of Medicinal Herbs for Anti-obesity Potential. *Orient J Chem* 2023;39(6). Available from: <https://bit.ly/3R2be6v>**

Obesity is stated to be a notable concern for public health and plays a significant role in the development of numerous non-communicable diseases (NCDs), including conditions affecting the heart, metabolism, and the nervous system. The use of medicinal plants to maintain normal weight and excellent health has been researched for a very long time. However, sufficient empirical data are still lacking to support the scientific notion of the use of herbal products for weight management. Obesity has traditionally been treated with herbal remedies from both domestic and international sources, including Ayurveda (Indian Traditional Medicine System). This article provides a brief overview of obesity-related disorders and their epidemiology, then discusses the potential anti-obesity effects of plants including *Salvia plebian*, *Glycine max*, *Curcuma longa*, *Camellia sinensis*, *Moringa citrifolia*, and others using validated tested animal models. It also focuses on the active phytochemical components that give these substances their anti-obesity properties, such as daidzein, ginsenosides,



curcuminoids, zingiberene, curcumene, and ellagitannin. The paper was compiled after going through marketed formulations used worldwide, clinical trials and patents based on herbal products for obesity. This review can assist numerous researchers in conducting additional research on exploring the potential.

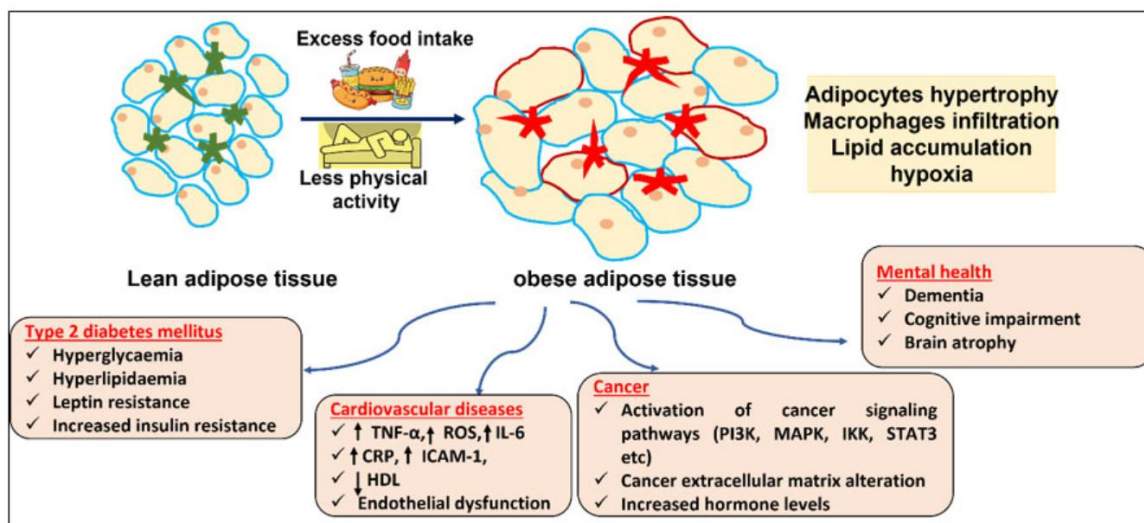
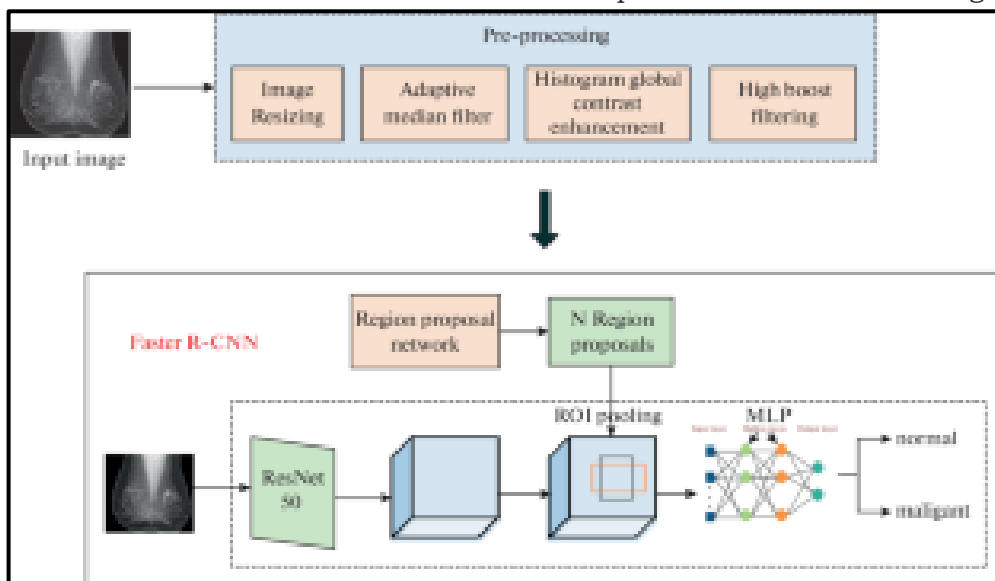


Figure 1: Obesity-induced co-morbidities

**3. Poonam Rana, Gupta, P.K. & Sharma, V. Detection and Prediction of Breast Cancer Using Improved Faster Regional Convolutional Neural Network Based on Multilayer Perceptron’s Network. *Opt. Mem. Neural Networks* 32, 86–100 (2023). <https://doi.org/10.3103/S1060992X23020054>**

One of the most frequent causes of death for women worldwide is breast cancer. In most cases, breast cancer can be quickly identified if certain symptoms emerge. But many women with breast cancer don’t show any symptoms. So, it is very critical to detect this disease in early stage also numerous radiologists are needed to diagnose this disease which is quite expensive for the majority of cancer hospitals. To address these concerns, the proposed methodology creates a Faster-Regional Convolutional Neural Network (Faster-RCNN) for recognizing breast cancer. Ultrasound images are collected and pre-processed utilizing resizing, adaptive median filter, histogram global contrast enhancement and high boost filtering. Image resizing is utilized to change the image size without cutting anything out. Adaptive median filter is utilized to remove unwanted noise present in the resized image.

Histogram global contrast enhancement is used to enhancing the contrast level of the image. High boost filtering is utilized to sharpening the edges present in the image. After that, pre-processed images are



fetches as an input to Faster R-CNN, which extract the features and segment the accurate

region of the tumour. These segmented regions are classified using Multilayer Perceptron's for detecting whether the patients are affected by breast cancer or not.

According to the experimental study, the proposed approach achieves 97.1% correctness, 0.03% error, 91% precision and 93% specificity. Therefore, the developed approach attains better performance compared to other existing approaches. This prediction model helps to detect breast cancer at early stage and improve patient's living standard.

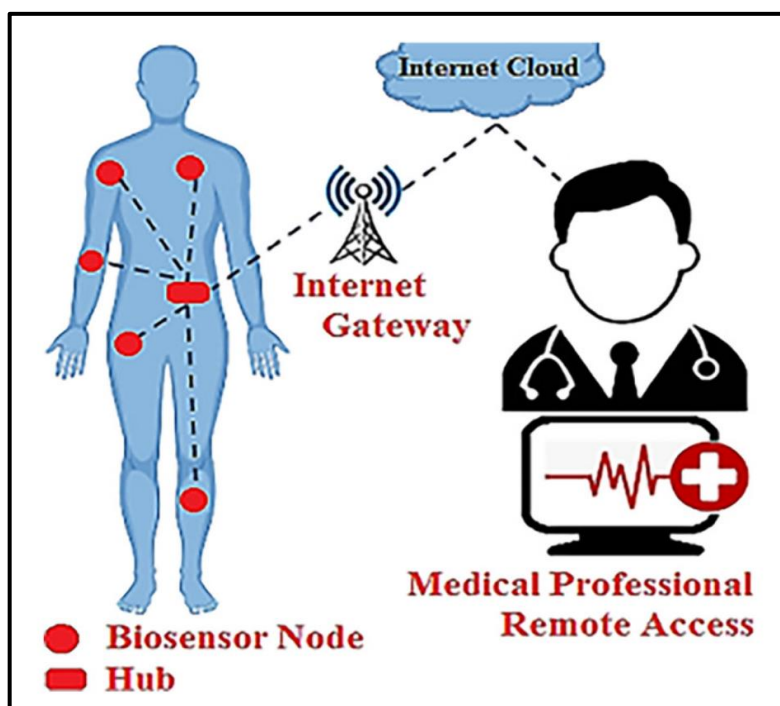
**4. Ajay Kumar, Anuj Kumar Singh, Ankit Garg, "Evaluation of machine learning techniques for heart disease prediction using multi-criteria decision making", Journal of Intelligent & Fuzzy Systems, vol. 46, no. 1, pp. 1259-1273, 2024, DOI: <https://doi.org/10.3233/JIFS-233443>**

Globally, heart disease is the primary cause of death. Early detection of this disease enables cardiologists to make more accurate judgments regarding the health of their patients. Due to machine learning's ability to identify patterns in data, its use in the medical industry has increased. Many heart disease prediction models have been developed by various researchers utilizing machine learning techniques (MLTs). The performance of MLTs on heart disease prediction may vary for different accuracy measures. Thus, the choice of the appropriate machine-learning technique for heart disease prediction is a challenging task. This paper proposes a multi-criteria decision-making (MCDM)-based method to evaluate the MLTs for heart disease prediction considering various performance measures taken into account altogether. The proposed approach uses the concept of a combined compromise solution (CoCoSo)- an MCDM method. For validation of the proposed approach, an experimental study was conducted to evaluate the performance of fifteen machine learning techniques for predicting heart disease over three heart disease datasets considering six performance measures taken into account altogether. Results show that the logistic regression and support vector machine are recommended as the most suitable MLTs for heart disease prediction modeling with respect to six performance measures considered simultaneously.

**5. Shukla S, Sachan VK, Sinha A, Pandey SK, Rao GM, Shah MA, Choudhary A, Tamrakar B. WHOOP<sup>H</sup>: whale optimization-based optimal placement of hub node within a WBAN. Sci Rep. 2024 Feb 10;14(1):3422. DOI: <https://doi.org/10.1038/s41598-024-53889-1> PMID: 38341483; PMCID: PMC10858936.**

Biosensor nodes of a wireless body area network (WBAN) transmit physiological parameter data to a central hub node, spending a substantial portion of their energy. Therefore, it is crucial to determine an optimal location for hub placement to minimize node energy consumption in data transmission.

Existing methods determine the optimal hub location by sequentially placing the hub at multiple random locations within the WBAN. Performance measures like link reliability or overall node energy consumption in data transmission are estimated for each hub location. The best-performing location is finally selected for hub placement. Such methods are time-consuming. Moreover, the involvement of other nodes in the process of hub placement results in an undesirable loss of network energy. This paper shows the whale optimization algorithm (WOA)-based hub placement scheme. This



scheme directly gives the best location for the hub in the least amount of time and with the least amount of help from other nodes. The presented scheme incorporates a population of

candidate solutions called "whale search agents". These agents carry out the iterative steps of encircling the prey (identifying the best candidate solution), bubble-net feeding (exploitation phase), and random prey search (exploration phase). The WOA-based model eventually converges into an optimized solution that determines the optimal location for hub placement. The resultant hub location minimizes the overall amount of energy consumed by the WBAN nodes for data transmission, which ultimately results in an elongated lifespan of WBAN operation. The results show that the proposed WOA-based hub placement scheme outperforms various state-of-the-art related WBAN protocols by achieving a network lifetime of 8937 data transmission rounds with 93.8% network throughput and 9.74 ms network latency.

### Reimbursement of Conference Registration Fee

S. No	Name of Faculty	Designation	Dept.	Name of Conference	Title of Paper	Benefits/Incentives	Published By
1.	Himanshu Chaudhary	Assistant Professor	ECE	International Conference on Sustainable Emerging Innovations in Engineering and Technology (ICSEIET - 2023) ABES Engineering College, Ghaziabad, U.P., India.	Analysis and Classification of Skin Cancer Using Deep Learning Approach	7,500	IEEE
2.	Umang Rastogi	Assistant Professor	CSE	International Conference organized by Galgotias University, Greater Noida, U.P., India.	Recognition of Indian Sign Language using Hand Gestures	6,000	IEEE
3.	Swati Sharma	Associate Professor	CSE	The 5th International Conference on Data & Information Science (ICDIS - 2023) Raja Balwant Singh Engineering Technical Campus, Bichpuri, Agra, U.P., India.	A Novel image Captioning Approach Using CNN and MLP	6,518	IEEE

4.	Rashika Bangroo	Assistant Professor	CSIT	International Conference by IIT - Rorkee in Virtual mode	Comparative Study of Elastic Net Regression, Naive Bayes & Lasso Regression	9,000	IEEE
5.	Meeta Chaudhry	Associate Professor	CSIT	International Conference Organised by Amity University, Tashkent, Uzbekistan in Virtual Mode	An Analysis of Deep Learning-Based Studies on Object Detection	8,000	IEEE (Scopus)

1. **H. Chaudhary, R. Gautam, P. Kumar and A. Sharma, "Analysis and Classification of Skin Cancer Using Deep Learning Approach," 2023 International Conference on Sustainable Emerging Innovations in Engineering and Technology (ICSEIET), Ghaziabad, India, 2023, pp. 458-463.**

DOI: <https://doi.org/10.1109/ICSEIET58677.2023.10303579>.

Disease that occurs from the unregulated expansion of irregular epidermal cells is always considered to be deadly and of utmost concern, if not recognized and treated during a preliminary phase. Any sort of melanoma cancer's preexisting diagnosis encourages hope for improvement. But the method employed in diagnosis of such a phenomenon is a laborious procedure. This work proposes a computer assistance based deep learning method to detect and analyze the irregular expansion of the epidermal cells. The method of diagnostic imaging with computer assistance has proven to be more effective in recent past. Deep learning is a kind of artificial intelligence that mimics how the human mind processes information and creates connections to aid in judgment. Convolutional neural networks are being employed in this study to examine and classify different categories of images. The algorithms used for classification and analysis are Inception-V3, Mobile net, Vgg-16, and a custom CNN model from scratch. This work also examines other AI-based skin cancer screening methods as well. In this case, a pre-trained model is reused utilizing the approach of transfer learning, and a new model was also created from start utilizing CNN structures. A website application that uses JavaScript, Flask, and CSS is indeed exhibited; all we need to do is upload the inspection picture, and it will forecast the results. A web app aids in providing the individual with the outcome. In a nutshell, the proposed work would help in earlier diagnosis of skin cancer.

2. **Umang Rastogi, Anand Pandey, Vinesh Kumar, "Recognition of Indian sign language using hand gestures", Book Chapter in Artificial Intelligence, Blockchain, computing, and security Vol. 1, 1st Edition, CRC Press 2023.**

<https://www.taylorfrancis.com/chapters/edit/10.1201/9781003393580-23/recognition-indian-sign-language-using-hand-gestures-umang-rastogi-anand-pandey-vinesh-kumar>

In this study, we present a method for decoding Indian Sign Language alphabets using hand gesture recognition. Our proposed approach consists of four modules: gesture recognition, feature extraction, real-time tracking, and segmentation of hand. Utilizing the Hue, Intensity, Saturation (HSV) color model and the Camshift approach, hands are tracked and segmented. Gestures can be identified using the Genetic Algorithm. For correctly classifying single-handed and double-handed motions, we propose a straightforward, affordable technique. The employment of this method has allowed many of impaired people to interact with normal people.

3. **Sharma, S., Tomar, V., Yadav, N., Aggarwal, M. (2024). A Novel Image Captioning Approach Using CNN and MLP. In: Tiwari, S., Trivedi, M.C., Kolhe, M.L., Singh, B.K. (eds) Advances in Data and Information Sciences. ICDIS 2023. Lecture Notes in Networks and Systems, vol 796. Springer, Singapore. [https://doi.org/10.1007/978-981-99-6906-7\\_2](https://doi.org/10.1007/978-981-99-6906-7_2)**

Computer vision and natural language processing researchers have dedicated significant time and energy to the problem of automatically creating image descriptions. In this work, we propose an artificially intelligent picture captioner built on a hybrid architecture of convolutional neural networks (CNNs) and multilayer perceptron (MLPs). This system will take photographs as input and generate captions based on those images using algorithms from convolutional neural networks (CNN), multilayer perceptron (MLP), recurrent neural networks (RNN). To generate a natural language caption, CNN first extracts feature from the input image, and then the MLP analyses these features. The proposed model is trained on a dataset of photos with captions by optimizing the parameters of a convolutional neural network (CNN) and a multilayer perceptron (MLP) via a hybrid of supervised learning and reinforcement learning. Our results demonstrate that the suggested model may produce captions that are on par with the best methods currently available in terms of accuracy and variety. The artificially intelligent picture captioner has potential uses in many areas, such as social networking, e-commerce, and image retrieval systems.

**4. R. Bangroo, S. R. Verma, Shivangi and Shakuntala, "Comparative Study of Elastic Net Regression, Naive Bayes & Lasso Regression," 2023 International Conference on Electrical, Electronics, Communication and Computers (ELEXCOM), Roorkee, India, 2023, pp. 1-6,**

**DOI: <https://doi.org/10.1109/ELEXCOM58812.2023.10370433>.**

This study aims to determine which algorithm is better at estimating target variables based on a set of independent variables. This case study compares three different machine learning algorithms: Naive Bayes, Lasso Regression and Elastic Net Regression. The data used in this research is real-world data with many features. The article begins by explaining how each algorithm works and then evaluates it on various parameters such as Accuracy, Recall, and Prediction. The result of the study shows that Naive Bayes outperforms Lasso Regression and Elastic Net in terms of accuracy and precision, while Elastic Net has the highest return. The article concludes that the choice of algorithm depends on the problem at hand and that researchers should consider all parameters before choosing an appropriate algorithm.

**5. M. Chaudhry, S. Maurya, S. Pratap Singh and S. Yadav, "An Analysis of Deep Learning-Based Studies on Object Detection," 2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS), Tashkent, Uzbekistan, 2023, pp. 134-138,**

**DOI: <https://doi.org/10.1109/ICTACS59847.2023.10390091>.**

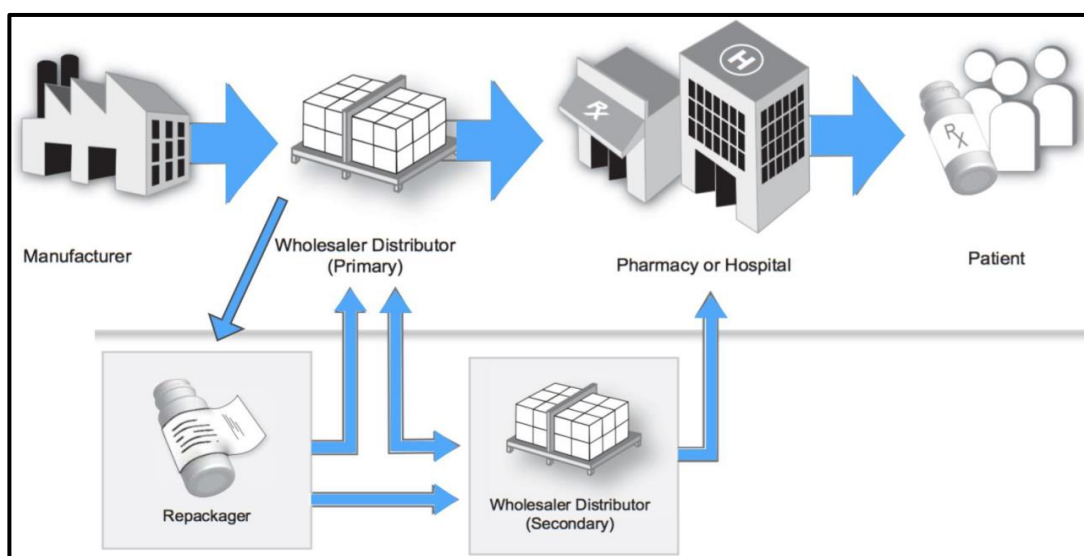
Target or object identification has developed into a significant research focus in the last 25 more years and also is a practical problem in computer vision that is employed widely across the globe. It makes use of deep learning to quickly & accurately locate and identify the vast number of different object in the given image that fall into specified category. The algorithm falls into two groups under the model training approach: one is single-stage detection algorithm and other is double stage detection algorithms. The study paper presents in-depth introductions to the exemplary algorithms at each level. Then, after introducing both common public and unique datasets for target or object detection, numerous sample techniques are examined and contrasted in this area. Finally, various algorithms are used to forecast the probable difficulties in target detection.

## Innovation Spotlights of the Month

### Blockchain Technology

The pharmaceutical business benefits greatly from blockchain technology at every level of drug development and distribution. Because of the sensitive nature of the data, stakeholders in the pharmaceutical sector are notoriously discreet about their information. A blockchain is a viable tool for tracking and safeguarding the pharma transaction ecosystem.

- Fixing global supply chain vulnerabilities.
- Accelerating collaborations among companies
- Reducing fraud and assuring product authenticity



### 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 m<sup>3</sup> 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 CO<sub>2</sub> 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>

### **Microcontrollers For Smart Energy and IoT**

*The microcontrollers offer low-power operation for energy management, IoT applications, and firmware updates in smart devices.*



Renesas Electronics Corporation, a provider of advanced semiconductor solutions, has launched the RA2A2 microcontroller (MCU) Group, powered by the Arm Cortex-M23 processor. The low-power MCUs feature a 24-bit Sigma-Delta analogue-to-digital converter (SDADC) and a unique dual-bank code flash with bank swap functionality, simplifying firmware over-the-air (FOTA) updates for applications in smart energy management, building automation, medical devices, consumer electronics, and other IoT areas.

The MCUs are designed for energy efficiency, offering multiple power structures and voltage detection hardware for ultra-low power operation, as low as 100  $\mu\text{A}/\text{MHz}$  in active mode and 0.40 $\mu\text{A}$  in software standby mode. They also include an independent power supply real-time clock for extended battery life in demanding conditions, AES hardware acceleration, a high-precision on-chip oscillator, a temperature sensor, and a wide operating voltage range from 1.6V to 5.5V.

Optimized for smart energy management, the RA2A2 MCUs support the digitalization of traditional systems with features like high-level analogue sensing, FOTA support, hybrid sampling, and AES hardware acceleration. For instance, next-generation smart electricity meters equipped with Non-Intrusive Load Management (NILM) technology can monitor energy consumption by analyzing the current and voltage of the total load, offering a cost-effective and scalable solution for enhancing energy efficiency and reducing consumption.

Key Features of the RA2A2 Group MCUs include:

- Core: 48MHz Arm Cortex-M23

- Memory: 512KB integrated, dual-bank Flash memory and 48KB SRAM
- Analog Peripherals: 24-bit Sigma Delta ADC with a digital filter, 12-bit ADC, and temperature sensor.
- Packages: 100-, 80- and 64-pin LQFP

The MCUs come with support for Renesas' Flexible Software Package (FSP), which speeds up application development by offering necessary infrastructure software, such as RTOS, BSP, peripheral drivers, middleware, and security stacks, along with reference software for AI, motor control, and cloud solutions. It allows for the integration of legacy code and the choice of RTOS with FSP, providing flexibility in application development. Additionally, using the FSP simplifies the migration of RA2A2 designs to larger RA devices if desired.

India has a rich & diverse lingual demographic, with 80% of the population identifying themselves as Non-English, Native Language speakers. A significant outcome of this regional diversity is the challenge in delivering standardized and high-quality educational content in a manner that is comprehensible to students with diverse regional languages being spoken. Further, within higher education hotspots in the country students coming from rich diverse cultural backgrounds experience barriers to communication owing to distinct languages spoken eventually constrains the extent of collaboration and innovation that students can be capable of. Similarly scope for cross country collaboration in research is constrained due to language.

**The ANUVADINI:** Voice & Document AI Translation Tools consisting of a multitude of features and functionalities desires to close this gap arising due to language barriers. The tool has support for 22 regional Indian & foreign languages helping break language barriers & unifying India and the World under the principles of Ek Bharat Shrestha Bharat and One Earth, One Family, One Future!

While having its inception as a technology solution for providing equitable access to quality education, the use cases of the Anuvadini bouquet of tools are numerous and evolving with expected impacts of smooth communication and information flow in the domains of External Relations, Agriculture, Commerce, Railways & Transport, Scientific Research and Innovation.

Anuvadini presents a tremendous opportunity for national unity and effective communication across the country while celebrating linguistic diversity and history of the country.

**To realize the policy envisioned in NEP-2020 in leveraging technology for teaching, learning, testing and translation and to infuse advanced digital technology in the field of education and instruction.**

The Anuvadini Foundation was established by Ministry of Education as a not-to-profit Section 8 company under the aegis of All India Council for Technical Education (AICTE) on 2nd August 2023. A copy of the Certificate of Incorporation and License Granted by Registrar of Companies is annexed. The Board of Directors of the company are as under: -





## **India's First Indigenous Hydrogen Fuel Cell Ferry**

On February 29th, 2024, Prime Minister Narendra Modi virtually inaugurated India's first indigenous hydrogen fuel cell ferry at Kochi Harbor in Kerala. The 24-meter vessel, built by Cochin Shipyard Limited (CSL), marks a major advancement in sustainable transportation for the country.

### ***Vessel Details***

Named 'Suchetha', the catamaran ferry utilizes an electric propulsion system powered by hydrogen fuel cells. With a capacity to carry 50 passengers, it features air conditioning and comfortable seating. The onboard fuel cells generate power through a chemical reaction between hydrogen and oxygen, with water and heat as the only byproducts.

According to CSL authorities, the ferry has a low draft of 1 meter, allowing it to navigate Kochi's intricate network of backwaters. Its lightweight yet durable hull gives it a top speed of 12 knots. Safety is also enhanced through fire detection systems and damage stability.

### ***Indigenous Technology***

Suchetha's fuel cells and electric motors have been developed indigenously as part of the Kochi International Water metro project. Led by CSL in partnership with manufacturers such as L&T and Indian Register of Shipping, the endeavor furthers the central government's vision of "Aatmanirbhar Bharat".

Speaking at the launch, PM Modi said the ferry showcases India's potential to harness technology to power sustainable mobility systems. He added that public transport fueled by green energy will expand in both land and water-based urban transportation.

The Prime Minister also called the project a fine example of inter governmental cooperation, applauding the efforts of Inland Waterways Authority of India, Ministry of Ports, Shipping and Waterways, Ministry of Environment and Forests, the Kerala government and other stakeholders.

### ***Benefits***

As the country's first hydrogen-powered vessel, experts believe Suchetha will pave the way for cleaner ferry transit across India's extensive canal networks. Especially in congested urban pockets, the zero-emission ferry can decongest roads and reduce noise and air pollution.

Additionally, the project creates high-skilled employment opportunities and builds domestic technical capabilities in sustainable marine technologies. Officials feel cost parity with conventional ferries can be attained in the near future with localization of parts manufacturing.

### ***Future Prospects***

Drawing confidence from Suchetha's success, Cochin Shipyard has already invested in constructing 7 more hydrogen fuel cell boats of varying passenger capacities. CSL also looks to tap the international market for clean marine technologies.

In his address, PM Modi stated that India aims to build such low-cost, zero-emission ferry systems in cities across the country under both public and private partnership models.

**Source:** <https://www.gktoday.in/indias-first-indigenous-hydrogen-fuel-cell-ferry/>

## **KIET (R&D) Policies**

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

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

**For details, kindly refer -**

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

### **Salient Features of KIET (R&D) Research Policy**

#### **1. Membership of Professional Societies**

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

#### **2. PhD- Fee Reimbursement, OD & Incentives**

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

<b>S. No.</b>	<b>Category</b>	<b>Ph.D. Benefits</b>	<b>Requirements/Conditions</b>
<b>1.</b>	Ph. D (Part Time) Fee Reimbursement	On acquisition of the Ph.D. from Institutes/Universities of repute (IISc Bangalore, IITs, JNU, NITs, IIITs and Central Universities of repute), a faculty may avail Ph.D. tuition fee reimbursement on an actual basis but not exceeding Rs. 30,000/-	Faculty members entering service without a Ph.D. shall be encouraged to enroll themselves/acquire Ph.D. in the relevant branch/discipline from Institutes/ Universities of repute (IISc Bangalore, IITs, JNU, NITs, IIITs and Central Universities of repute).  One needs to claim the Ph.D. tuition fee reimbursement within a month after award of degree by submitting a copy of

		per year (on prorata basis with salary) for three years after fulfilling conditions as mentioned.	degree certificate and tuition fee paid slips. Two Research Publications in SCI Journals with the affiliation as “KIET Group of Institutions, Delhi- NCR, Ghaziabad” (Annexure B). Faculty should submit the undertaking for serving the Institute for at least one year. In case of non- fulfillment of serving for one year, faculty member should refund the reimbursed Ph. D tuition fee.
<b>2.</b>	ODs	<p>The maximum total number of ODs for completing a Ph.D. is 12 per academic year/leave year for a maximum of 4 years.</p> <p>A maximum of 3 ODs at a stretch can be given to a faculty member in a month at the discretion of HoD (provided there is no academic loss of students) just after the Ph. D registration.</p> <p>Faculty may avail the facility of OD for pursuing Ph.D. immediately post joining KIET.</p> <p>If the course work of Ph.D. program falls during summer break, then faculty must consume their summer vacation first (two weeks) and rest will be treated as OD provided the count remains 12 ODs per academic/ leave year.</p> <p>For completing the course work 3-4 months Leave without pay (LWP) can be given to faculty members at the discretion of HoD provided</p> <p>There is no academic loss of students and department will be able to manage without any substitute.</p>	<p>Faculty members entering service without a Ph.D. shall be encouraged to enroll themselves/acquire Ph.D. in the relevant branch/discipline from Institutes/ Universities of repute (IISc Bangalore, IITs, JNU, NITs, IIITs and Central Universities of repute).</p> <p>One needs to claim the Ph.D.tuition fee reimbursement within a month after award of degree by submitting a copy of degree certificate and tuition fee paid slips.</p> <p>Two Research Publications in SCI Journals with the affiliation as “KIET Group of Institutions, Delhi- NCR, Ghaziabad” (Annexure B).</p> <p>Faculty should submit the undertaking for serving the Institute for at least one year. In case of non-fulfillment of serving for one year, faculty member should refund the reimbursed Ph. D tuition fee.</p>
<b>3.</b>	Incentives on Award of Ph.D. Degree	Five increments shall be admissible at the entry-level of recruitment to faculty members possessing the degree of Ph. D (full time), awarded in the relevant discipline from Institute/ University	<p>Ph.D. is in the relevant branch/discipline and has been awarded by a university and two Research Publications in SCI Journals with affiliation as “KIET Group of Institutions, Delhi-NCR, Ghaziabad”.</p> <p>One needs to claim the Ph. D incentives within a month after the award of the degree by submitting a copy of degree</p>

		<p>of repute (IISc Bangalore, IITs, JNU, NITs, IIITs and Central Universities of repute).</p> <p>Faculty members who complete their Ph.D. degree (part time) while in service shall be entitled to three increments.</p>	<p>certificate/provisional degree certificate.</p> <p>The Ph.D. incentives in terms of increments will be applicable from the date of submission of the application copy along with the copy of the degree certificate/provisional degree certificate.</p> <p>During recruitment, if faculty intimates that the Ph. D thesis has been submitted, then faculty will have to complete the Ph. D within one year for entitlement of five increments else three increments would be awarded.</p>
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### 3. Research Incentives for Students (Journals)

- An incentive amount of rupees five thousand (Rs. 5,000/-) is applicable to student authors for publications in any SCI, non-paid journals.
- An incentive amount of rupees three thousand (Rs. 3,000/-) is applicable to student authors for publications in any Scopus, non-paid journals.
- In the case of a multi-authored publication, the incentive will be equally shared by the authors.
- Published papers must have "**KIET Group of Institutions, Delhi-NCR, Ghaziabad**" as the affiliation.
- The application with the relevant documents to be submitted to the Head of the Department once the research paper is published.
- The author needs to claim the incentive only after the volume number, issue number, and page number have been assigned to the research paper by the journal.
- Authors must also be aware of the KIET Ethics Policy for Students and Faculty Members on academic dishonesty and plagiarism (**Annexure I**).
- A publication claim under the Research Incentive Schemes (RIS) of KIET must be made within a month of publication in the prescribed form to the Head of the Department (**Annexure II (a)**). The Head of the Department will send the file with recommendations to the Registrar office for further processing.

### Presentation of Research Papers in Conferences in India

- The International/National conference must be of repute (viz. IEEE, Springer/Wiley/IPC etc.) and the hosting institutions must be of repute as well (IITs/IISc/NITs/IIITs/Universities/Deemed Universities etc.).
- The faculty would be allowed OD + Registration + T.A. on an actual basis or Rs. 20,000/- whichever is less.
- Only one faculty member may use the facility in the case of joint authorship.
- Each faculty member can present research papers at conferences of repute twice in an academic year with financial assistance (limited to Rs. 20,000/-only).
- The maximum number of ODs is limited to one week during the lean period. Only one one-day ODis allowed in the academic period.

- Authors must also be aware of the KIET Ethics Policy for Students and Faculty Members on academic dishonesty and plagiarism (**Annexure I**).
- Published paper must have '**KIET Group of Institutions, Delhi-NCR, Ghaziabad**' as the affiliation.
- Only oral presentation of research papers is acceptable.
- To raise the number of citations for improvement of KIET NIRF Ranking, it is mandatory for the perspective authors to include at least two references of already published Research Papers by KIET faculty in their Research papers.
- A publication claim under Research Incentive Schemes (RIS) of KIET must be made within a month of the publication of a research paper in Conference Proceedings Citation Index-Science (CPCI-S), Conference Proceedings Citation Index-Social Sciences & Humanities (CPCI-SSH) and SCOPUS Indexed Conference Proceedings in the prescribed form (**Annexure III (a)**).
- Details of the knowledge sharing session must be submitted while making the claim (**Annexure III (b)**).
- The application with the relevant documents to be submitted to the Head of the Department once the research paper is published and is available online.
- For the Research paper Publication by students (based upon Final Year Project outcome as notified by Dean Academics) in Scopus Indexed Conference, the institute will reimburse 50% of the registration fee to each project group.
- For the Research paper Publication by students (other than Final Year Project outcome) in Conferences by student of I, II, III and IV years, the institute will reimburse Rs. 2,000 or T.A (as per Institute policy), registration fees whichever is less.
- Only one student may use the facility in the case of joint authorship.
- A publication claim must be made within a month of the publication of a research paper in the prescribed form to the Head of the Department (**Annexure III (a)**). In case of student publication, the Head of the Department will send the file with recommendations to the Registrar office for further processing.


**Note: For Annexures and more details kindly refer:**

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

# Patents Granted




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**Dr. K. Nagarajan**  
HOD & Professor  
KIET School of Pharmacy (KSOP)



**Date of Grant**  
08<sup>th</sup> February 2024  
**Application No. - 202211008326**

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**Dr. Neelesh Ranjan Srivastava**  
Assistant Professor  
Electronics & Communication Engineering  
(ECE)




**Date of Grant**  
10<sup>th</sup> January 2024  
**Application No. - 202211027843**

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# Patents Granted




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**On receiving grant certificate from Govt. of India  
for Patent Titled “IoT Based Fake News Detection System”**




**Dr. Vineet Kumar Sharma**  
HOD & Professor  
Computer Science & Engineering (CSE)

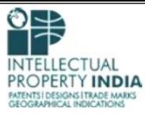


**Date of Grant**  
29<sup>th</sup> September 2023  
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GEOGRAPHICAL INDICATIONS

## Congratulations

**On receiving grant certificate from Govt. of India  
for Patent Titled “Smart Highway Fog Prediction system”**



**Mr. Amrish Gangal**  
Assistant Professor & Addl. HOD  
Computer Science & Information  
Technology (CSIT)



**Date of Grant**  
19<sup>th</sup> December 2023  
**Application No. - 202211027842**

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### Various Research Labs in KIET

S. No.	Research Lab/Centre of Excellence	Department
4.	Centre of supercomputing equipped with NVIDIA DGX A100	CS (AI ML)
5.	Centre of Robotics and Mechatronics	ECE
6.	KIET NI LABVIEW Academy	ECE
7.	Bio-Medical Instrumentation MBS	ECE
8.	Space Technologies	ECE
9.	D-Link Global Center of Excellence	IT, CS, MCA
10.	Centre for Automotive Mechatronics in association Mercedes Benz	ME
11.	CAD/CAM Lab	ME
12.	Material Science & Testing Lab	ME
13.	IC Engine and Automobile Lab	ME
14.	Maker's Space Innovation Lab	All Branches
15.	Central Instrumentation Lab	Pharmacy
16.	Pharmacology research Lab	Pharmacy
17.	Center of Excellence for Renewable Energy based Power System for Electrical Power Supply and Transportation	EN
18.	Centre of Excellence in latest art of structural analysis and design facilities viz. STAAD PRO, E-TABS, SAP, ANSYS, PLAXIS, Primavera etc.	CE
19.	Centre of Excellence in Process Control and Industrial Automation	EN
20.	Finance Lab	MBA







**Birbal Sahni** (14 Nov. 1891 – 10 April 1949) was an Indian paleobotanist who studied the fossils of the Indian subcontinent.

He founded what is now the **Birbal Sahni Institute of Palaeobotany at Lucknow in 1946**. His major contributions were in the study of the fossil plants of India and in plant evolution.

He was also involved in the establishment of Indian science education and served as the President of the National Academy of Sciences, India and as an Honorary President of the International Botanical Congress, Stockholm.

Sahni was recognised by several academies and institutions in India and abroad for his research. **He was elected a Fellow of the Royal Society of London (FRS)** in 1936, the highest British scientific honour, awarded for the first time to an Indian botanist.

In 1948 he was elected an Honorary Member of the American Academy of Arts and Sciences. Another high honour which came to him was his election as an Honorary President of the International Botanical Congress, Stockholm in 1950. For his work in numismatics, he received the **Nelson Wright Medal in 1945**.

Maulana Abul Kalam Azad, Minister of Education in 1947 offered the post of Secretary to the Ministry of Education to Sahni. This he reluctantly accepted.

**The Birbal Sahni Gold Medal** for students of botany was instituted in his memory. A bust of Sahni is placed in the Geological Survey of India in Calcutta.

**KIET Group of Institutions**

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