Dr. C. K. Dwivedi
Professor
Department of Electronics and Communication
University of 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 6800+ students and is empowered with 350+ highly qualified full-time faculty to nurture our students. Institute credentials and Centers of Excellence can be viewed @ our website www.kiet.edu.

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

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

Assistant Dean, Promotion & Implementation of Sustainable Development in Research

Dr. Minakshi Karwal

Associate Prof. (AS)

Assistant Dean, Student Research Promotion in KIET

Dr. Shubham Shukla

Associate Prof. (ECE)

Assistant Dean, Research Quality Assurance

Dr. Himanshu Chaudhary

Assistant Prof. (ECE)

Assistant Dean, Industrial & Academia Research Collaboration & Promotion

Dr. Brijesh Singh

Associate Prof. (EN)

Assistant Dean, Intellectual Property Right (IPR)

Dr. Richa Goel

Associate Prof. (KSOP)

Member Secretary (Intellectual Property Right Committee)

Ms. Surbhi Kamboj

Assistant Prof. (KSOP)

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

Dr. Gaurav Sharma, Assistant Prof., Mechanical Engineering

Dr. Kunal Bisht, Assistant Prof., Civil Engineering

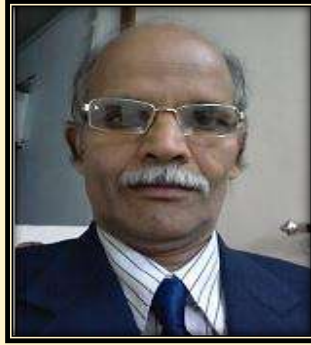Dr. Harsh Khatter, Assistant Prof., Computer Science

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

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

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Message from the Face of Cover Page

Dear Readers,

I am delighted to have the opportunity to write for the esteemed readers of KIET research magazine. This is an incredible practice that must be proliferated for further collaborative research and enlightening the readers as well as leveraging shared knowledge. while executing the published ideas to find solutions of complex world problems.

It is with immense gratitude and humility that I pen down these words, representing the distinguished title of the "face of the cover" for KIET Research Magazine - Anusandhan. Research has always been a passion of mine, driving me to explore the depths of knowledge and push the boundaries of what we know. In today's rapidly evolving world, research plays a pivotal role in shaping our future, driving innovation, and solving the challenges of our time. It is not just a field of study; it is a commitment to understanding, growth, and progress.

I believe that every individual has the power to make a difference, and it is through research that we can bring about positive change on a global scale. The recognition bestowed upon me as the "face of the cover" only strengthens my resolve to continue my pursuit of knowledge and contribute to the betterment of society. I would like to express my heartfelt appreciation to the entire team Anusandhan for their dedication to promoting research and knowledge-sharing. Your efforts in highlighting the work of researchers and scientists not only inspire the current generation but also pave the way for future innovators.

To my fellow researchers, I extend my gratitude for your unwavering dedication and collaborative spirit. It is through our collective efforts that we can unravel the mysteries of the universe, find solutions to complex problems, and create a brighter future for generations to come. I encourage everyone to support and invest in research, as it is the cornerstone of progress and a testament to human ingenuity. Let us continue to explore, question, and innovate, for it is in these endeavours that we discover the true potential of the human mind.

In conclusion, I am glad to witness the transformative role that research plays in shaping our domain. I would like to convey my heartiest congratulations to KIET Research Magazine for its remarkable efforts in the promotion and presentation of research in the research community. The research work presented in the KIET magazine will serve as a valuable resource for those who want to do action-oriented research. I wish all the researchers at KIET continued success and perfection in their scholarly pursuits. May your dedication to research, your spirit of inquiry, and your commitment to excellence continue to push the boundaries of human knowledge and contribute to a brighter and more prosperous future for all of us.

With the warmest congratulations and best wishes.

Dr. C. K. Dwivedi
Professor
Department of Electronics and Communication
University of Allahabad, Prayagraj India

Message from Chief Patron

Dear Members of the Research Community,

As the Director of the KIET Group of Institutions, I am pleased to introduce our latest research endeavours and their possibilities for shaping the future. Our vision is to push the boundaries of knowledge and innovation, and through the tireless efforts of our dedicated researchers, we can achieve this goal.

In the coming months, we will focus on various cutting-edge research topics, including artificial intelligence, biotechnology, and renewable energy. We aim to use these fields to address the most pressing challenges faced by society today, such as climate change, disease, and poverty.

We believe that by fostering an environment of collaboration and open communication, we can make significant progress in these areas. Our researchers will work closely with industry partners, government agencies, and other academic institutions to share their findings and develop new technologies and solutions.

We are excited about our research's possibilities and look forward to sharing our progress with the community. We expect our work to lead to breakthroughs and technologies that will positively impact society, and we are committed to making our research accessible to all who can benefit from it.

Finally, I would like to extend my warmest wishes to all our researchers and partners. Their hard work and dedication make our institute a leading force in the research community, and we are honoured to have you on board. Together, we can achieve remarkable things.

Dr. (Col) A Garg

Director

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Patron

Dear All,

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

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

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

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

Dr. Manoj Goel

Joint Director KIET

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Message from Editor-In-Chief

Dear Colleagues and Friends,

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

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

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

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

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

Dr. Vibhav Kumar Sachan

Dean (Research and Development)

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Foreword

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

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

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

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

Dr. Brijesh Singh

Editor
KIET Group of Institutions
Delhi-NCR, Ghaziabad

Foreword

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

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

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

Dr. Minakshi Karwal

Associate Editor

KIET Group of Institutions

Delhi-NCR, Ghaziabad

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

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

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

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

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

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

Dr. Himanshu Chaudhary

Associate Editor

KIET Group of Institutions

Delhi-NCR, Ghaziabad

Overview of the Research and Development

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

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

Vision

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

Mission

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

Contact
Office of Dean (R&D)
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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

The concluding ceremony of the 'Two-Week Faculty Development Program (FDP)' on 'Data Analytics using Power BI and Qlik Sense' took place on August 26, 2023. Organized by the Department of SD&FS in association with Lagozon Edutech Pvt. Ltd, the FDP ran from July 3 to July 21, 2023. This program marked an enriching voyage, brimming with knowledge, exploration, and skill elevation in the ever-evolving realm of data analytics.

The Department of SD&FS successfully concluded a transformative 2-week Faculty Development Program on data analytics using PowerBI and QlikSense. From July 3 to July 21, 27 enthusiastic participants from diverse departments at KIET delved into the world of data insights.
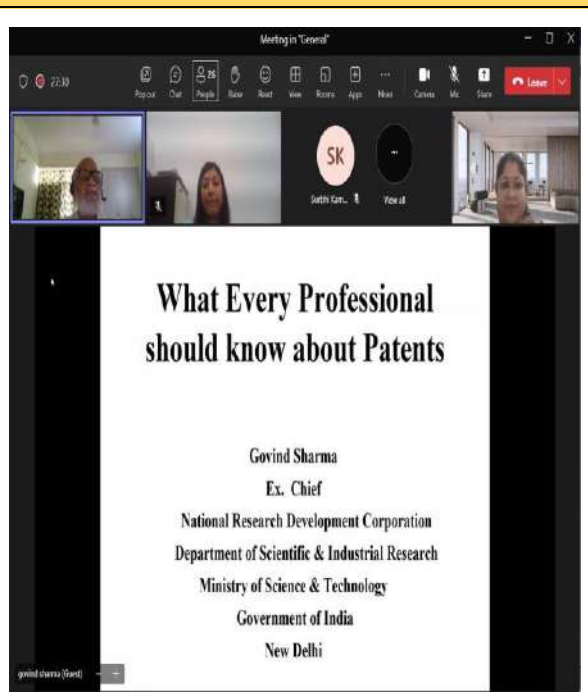
On 18th August 2023, KIET Group of Institutions organized an online workshop titled 'Patent: Essential Knowledge for Professionals.' The workshop aimed to propagate awareness about Intellectual Property Rights (IPR) while fostering the creation and commercialization of IP assets. The event featured Shri Govind Sharma, formerly Chief of National Research Development Corporation, an entity under the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India, New Delhi.

During the session, Shri Govind Sharma delved deeply into various facets of Intellectual Property Rights, elucidating their types and applications. He also expounded on different patent application categories and outlined the fundamental procedures for filing a patent. Furthermore, his discourse emphasized patent infringement matters and the avenues for commercializing patented technologies.

Dr. Himanshu Chaudhary, Assistant Professor in the ECE Department, delivered a session on 'Robotics and Artificial Intelligence' at DPS, Ranipur Haridwar, on August 16th, 2023, under the gracious guidance of Dr. Vibhav Sachan, HoD of ECE, and Dr. Ruchita Gautam, Additional HoD of ECE.

During the session, students and teachers engaged in discussions and showcased their robotics projects. Furthermore, the teachers expressed keen interest in visiting the Robotics lab of KIET Group of Institutions in the near future.

Statistics of KIET Research and Development Activities

Rankings & Accreditations

➢ **NAAC - Grade 'A+' (Cycle 2 Assessment) - Accredited for 5 years till 03 Jan 2027.**

➢ **NIRF 2023 (Pharmacy – Rank 88 & Engineering - Rank Band (151-200).**

➢ **NIRF 2023 Innovation Rank Band (51-100).**

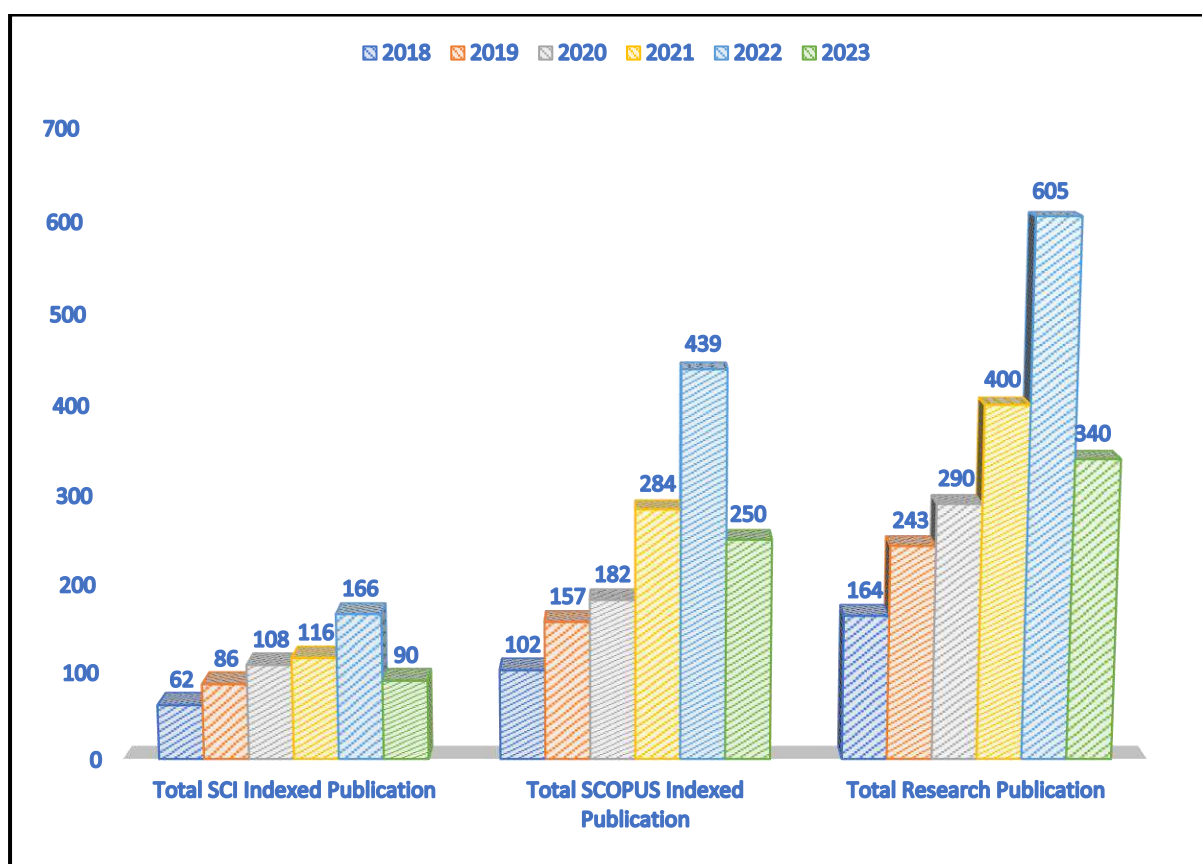➢ **QS-IGAUGE - 'Diamond' College Rating (till Feb 2024) & 'Institution of Happiness' Award.**

➢ **Innovation Hub, AKTU – Hon'ble VC AKTU Appointed KIET as Nodal Regional Centre**

➢ **NBA Accreditation - All eligible programs are NBA accredited.**

➢ **KIET Group of Institutions, Delhi-NCR, Ghaziabad (UP) recognized by the Scientific and Industrial Research Organization (SIROs) under Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India. (Till 31 Mar 2025)**

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(AN ISO 9001:2008 CERTIFIED DEPARTMENT)

भारत सरकार
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वैज्ञानिक और औद्योगिक अनुसंधान विभाग
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GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Scientific and Industrial Research
Technology Bhavan, New Mehrauli Road,
New Delhi - 110016

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

Date: 28th April 2022

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

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

Dear Sir,

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

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

3.	Receipt of this letter may kindly be acknowledged.

Yours faithfully,

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

KIET Research Credentials

A total of 628 SCI Research Publications and 1414 Scopus Indexed Research Publications with an affiliation of KIET Group of Institutions, Delhi-NCR, Ghaziabad are listed in Web of Science and in Scopus Database till August 2023.

Year	Total Number of SCI Indexed Publications	Total Number of SCOPUS Indexed Publications	Total Number of Research Publications
2018	62	102	164
2019	86	157	243
2020	108	182	290
2021	116	284	400
2022	166	439	605
2023	90	250	340
Total	628	1414	2042

Category	Number of Publication for July 2023	Number of Publication for August 2023
SCOPUS Publications	32	54
Web of Science Publication	14	16

Details of Patents Published/Granted

Title of the Invention: **Formulation and Development of Suppository Formulations for Anti-Hiv Drug Delivery**

Application Number: 20231145381 A (Indian Patent Office)

Applicant(s): Prof (Dr.) Nidagurthi Guggulla Raghavendra Rao (KSOP)

Date of Filing: 06-07-2023

Date of Publishing: 04-08-2023

Field of The Invention: The embodiments herein generally relate to a formulation and development of suppository formulations for Anti-HIV drug delivery.

Objects of the Invention: The system relates to compositions that contain phosphorus substituted anti-viral inhibitory compounds, therapeutic methods that include the administration of such compounds, as well as to procedures and intermediates helpful for 10 producing such compounds. The suppository formulation of this invention is not limited to suppository formulations with hydrophilic bases as the suppository base. The base of the suppository formulation, which is a hydrophilic base such polythene glycol 1000, may advantageously be included.

METHODOLOGY: In view of the foregoing, an embodiment herein provides a formulation and development of suppository formulations for Anti-HIV drug delivery. The amino acid conjugation can produce THC prodrugs with higher thermal, chemical, and enzymatic stability and hydrophilicity. These formulations will offer important therapeutic choices for a variety of disease states that are known to be improved by THC, such as chemotherapy-induced nausea and vomiting, wasting syndrome in HIV patients, multiple sclerosis, glaucoma, spasticity, and pain. The process entails, among other things, obtaining the aforementioned cultured cell, cultivating it in a medium that allows for the expression of a polypeptide encoded by the vector and the assembly of an antibody or a fragment of it, and then removing the antibody or fragment from the cultured cell or the medium of the cell. Avoiding the overall physiological effects of inappropriately delivering such medicines to other cells and tissues, including 15 uninfected cells, is one benefit of this treatment. Methods and compositions that permit the accumulation or retention of biologically active substances inside cells can be used to accomplish intracellular targeting. Successful and precise targeting of CCR5-positive human cells in vivo for transduction with a lentiviral vector encoding a powerful CCR5 shRNA conferring resistance to HIV-1 infection. In order to control rigidity and lessen serum-induced instability brought on by the binding of serum proteins to the liposome membrane, a portion of cholesterol is frequently added to the lipid formulation. The specific liposomal variant containing its targeting ligand on the external surface and its active agent of choice can selectively target any type of cell found within any kind of organ system as well as any kind of anatomic entity.
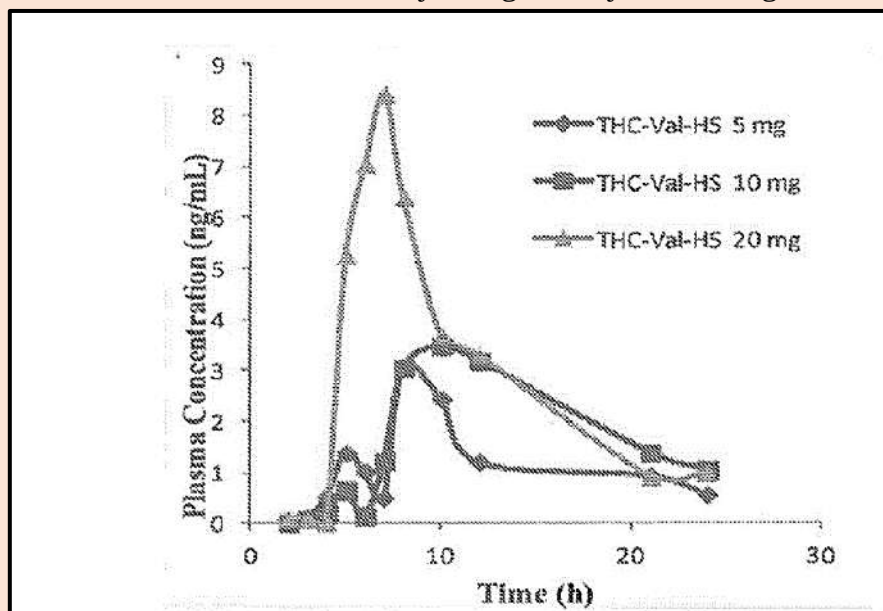
Conclusion: It increases the bioavailability of 9-THC for the treatment of any disease condition responsive to 9-THC, a suppository formulation is needed that contains a therapeutically effective amount of at least one compound from a 9-THC amino ester composition of the formula, where R1 and R2 are residues of natural amino acids, and salts thereof in a base that is suitable for suppositories.

Title of the Invention: IOT Based Streetlight Management System
Application Number: 202311046332 A (Indian Patent Office)
Applicant(s): Nishu Gupta and team (KIET Group of Institutions, CSE)
Date of Filing: 10-07-2023
Date of Publishing: 11-08-2023
Field of the Invention: The invention is related to the field of computer science where IOT based algorithms are applied in streetlight management systems.
Objective of Invention: The main objective is to implement the IoT-based streetlight management systems. The energy-saving lighting system which has a novel conception and is controlled by web of things.
The present invention is directed to:

- System describes intelligent wireless Lighting Control Assembly according to sensors characterized in Centralized Controller adopts GPRS, CDMA or 3G communication to relate to remote system control centre.
- Smart Street lighting is an IoT driven technology that offers immediate results. Smart street lighting is usually energy efficient, which uses high-efficiency LEDs equipped with sensors that provide optimum lighting based on pedestrian and vehicle traffic needs.
- When a street is empty, lights dim—and money and resources get saved. Parking lots can be dimmed during work hours and will illuminate when a car enters, while the rest of the parking spaces can be kept at diffused settings.
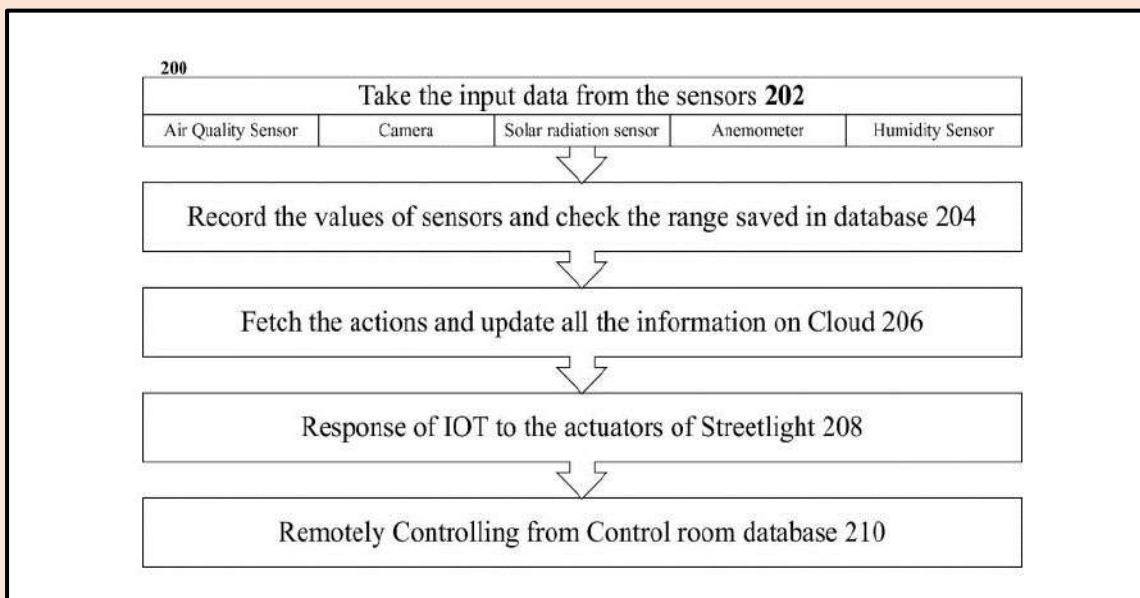

Figure 1: Illustrates workflow of a system with an embodiment of the present disclosure.
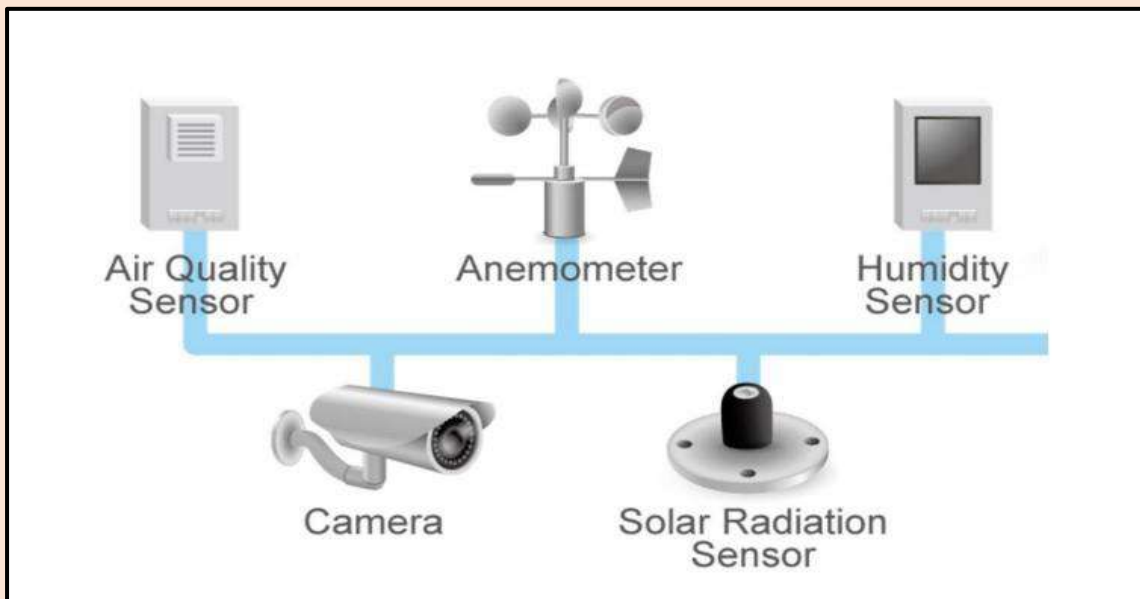

Figure 2: Illustrates a set of sensors and input devices used in the architecture of a system with an embodiment of the present disclosure.

Title of the Invention: **System for Quantifying the Impact of Social Media Influencers**
Application Number: 202311048799 A (Indian Patent Office)
Applicant(s): Mr. Rajat Tayal (KIET Group of Institutions)
Date of Filing: 20-07-2023
Date of Publishing: 11-08-2023
Field of the Invention: The present invention relates to the field of social media marketing and analytics. More specifically, it relates to a method and system for quantifying the impact and effectiveness of social media influencers in promoting products, brands, or services on various social media platforms.
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 system for quantifying the impact of social media influencers. It identifies high-performing influencers who resonate with their target audience and have the potential to drive meaningful results.
Detailed Description of the Invention: A method for quantifying the impact of social media influencers, includes collecting data from various social media platforms related to influencer performance, including follower counts, engagement metrics, click-through rates, and conversion rates, analysing the collected data using advanced analytics techniques and machine learning algorithms to identify patterns, trends, and correlations, and generating comprehensive metrics that evaluate the impact and effectiveness of each influencer, taking into account audience demographics, influencer relevance, and alignment with brand values.
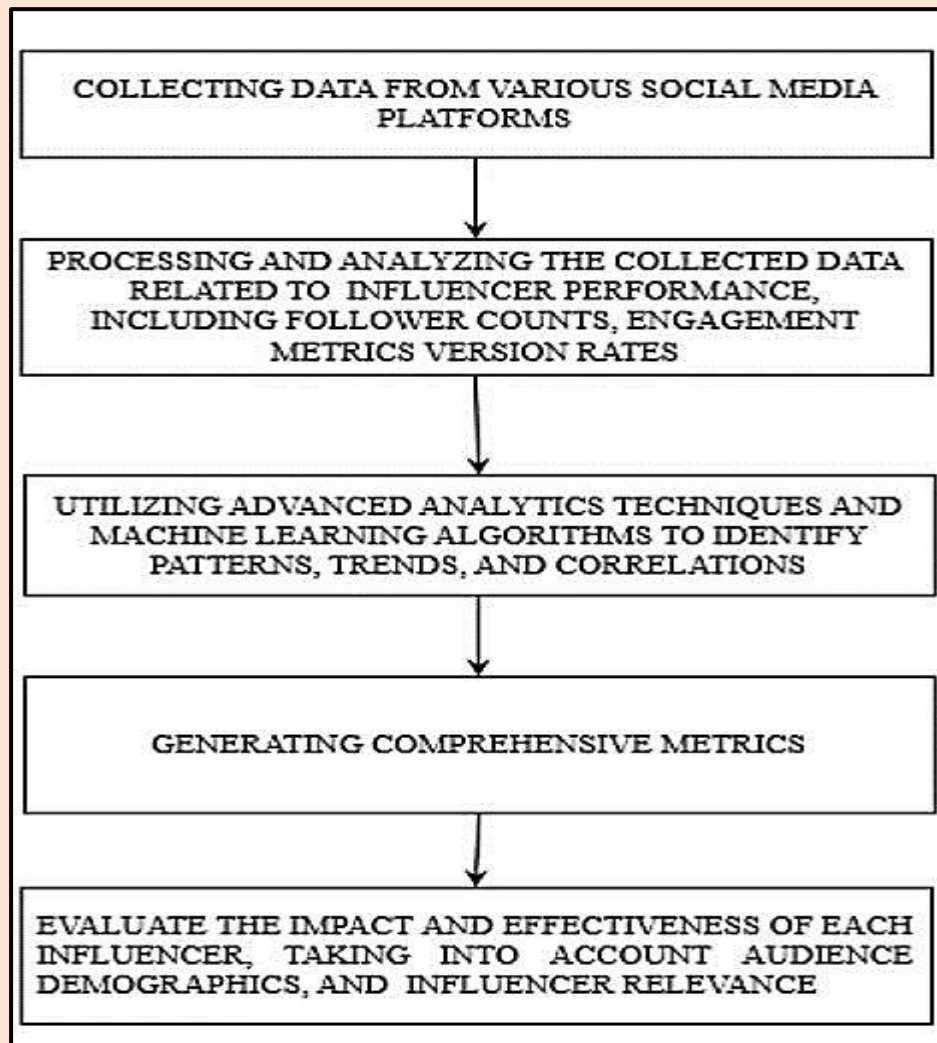

Fig. Illustrates flow diagram for the system for quantifying the impact of social media influencers.

PATENTS Published - August 2023

S. No.	Title Of Patent	Dept.	Name Of Applicant	Date Of Publication	Status
1.	Formulation and Development of Suppository Formulations for Anti-Hiv Drug Delivery	KSOP	Prof (Dr.) Nidagurthi Guggulla Raghavendra Rao	04.08.2023	Published
2.	A Collaborative Filtering-Based System for Opinion Extraction and Sentiment Analysis	IT	Mr. Analp Pathak, Kiet	04.08.2023	Published
3.	IoT Based Streetlight Management System	CSE	Nishu Gupta, Ila Kaushik, Kushal Gupta, Mai Dwivedi, Harsh Khatter	11.08.2023	Published
4.	Innovative Bioactive Dressing for Treatment of Diabetic Wounds	KSOP	Dr Monika Kaurav	11.08.2023	Published
5.	Refrigeration Unit with Independent Temperature Control Multiple Compartments Space	KSOP	Dr. Richa Goel, Prof. Dr. K. Nagarajan, Ar. Bhuvan Kumar Mishra	18.08.2023	Design
6.	System for Quantifying the Impact of Social Media Influencers	KSOM	Mr. Rajat Tayal,	11.08.2023	Published
7.	Spray Nozzle for Coating	KSOP	Prof (Dr.) Nidagurthi Guggulla Raghavendra Rao	25.08.2023	Design

Details of Research Incentives for Journals

S. No.	Name of Faculty	Designation	Dept.	Title of Paper and Name of Journal	Impact Factor/Cite Score	Benefits/ Incentives	Index in Journal
1.	Amit Kumar Arora	Associate Professor	KSOM	Digital Payment Apps: Perception & Adoption- A study of Higher Education Students; International Journal of Enterprise Network Management	1.3	3000	SCOPUS
2.	Sushil Kumar	Associate Professor	CSE	A Comprehensive Review on the Advancement of High-Dimensional Neural Networks in Quaternionic Domain with Relevant Applications"	9.7	21000	SCIE
3.	Sushil Kumar	Associate Professor	CSE	A novel non-linear neuron model based on multiplicative aggregation in quaternionic domain; International Journal on Complex & Intelligent Systems	5.8	15000	SCIE
4.	Shalini Kapoor	Assistant Professor	CSE	Detecting Emotion change instant in speech signal using spectral patterns in pitch coherent single frequency filtering spectrogram; International Journal- Expert System with Applications	8.5	21000	SCIE
5.	Ranchay Bhateja	Professor	KSOM	Working Women and Financial Literacy: A Study in Ghaziabad; International Journal of Statistics & Management Systems	-	2000	ESCI
6.	Gaurav	Assistant Professor	ME	Constitutive Behaviour of a Homogenised AT61 Magnesium Alloy Under Different Strain Rates and Temperatures	3.65	11000	SCIE

Highlights of the Published Journal Articles

1. **Amit Kumar Arora, Ankit Panchal, Vijay Prakash Gupta and Dhruv Sharma, "Digital Payment Apps: Perception & Adoption-A study of Higher Education Students", pp. 122-138, https://doi.org/10.1504/IJENM.2023.130774**

The advancement in technology and digitalisation provides a pathway for the adoption of digital payment. The study aimed to determine the awareness, perception, and role of demonetisation regarding the adoption of digital payment apps. The study collected the primary data through a structured questionnaire from 396 UG and PG students in the Ghaziabad district. The study found no significant difference between the expected and actual benefits of digital payment apps. Qualification and gender were found to be significant factors for the adoption of digital payment apps. Convenient, time-saving, and no need to carry cash are the main factors for adopting and using the digital payment app. Lack of trust, risk associated with it, and unavailability of the technical equipment are the reasons found by the study for not using digital payment apps. The study suggests ways for companies to build the trust of their customers to adopt digital payment apps.

2. **Kumar, S., Rastogi, U., "A Comprehensive Review on the Advancement of High-Dimensional Neural Networks in Quaternionic Domain with Relevant Applications". Arch Computat Methods Eng 30, 3941–3968 (2023). https://doi.org/10.1007/s11831-023-09925-w**

The neurocomputing communities have focused much interest on quaternionic-valued neural networks (QVNNs) due to the natural extension in quaternionic signals, learning of inter and spatial relationships between the features, and remarkable improvement against real-valued neural networks (RVNNs) and complex-valued neural networks (CVNNs). The excellent learning capability of QVNN inspired the researchers working on various applications in image processing, signal processing, computer vision, and robotic control system. Apart from its applications, many researchers have proposed new structures of quaternionic neurons and extended the architecture of QVNN for specific applications containing high-dimensional information. These networks have revealed their performance with a lesser number of parameters over conventional RVNNs. This paper focuses on past and recent studies of simple and deep QVNNs architectures and their applications. This paper provides the future directions to prospective researchers to establish new architectures and to extend the existing architecture of high-dimensional neural networks with the help of quaternion, octonion, or sedenion for appropriate applications.

3. **Kumar, S., Singh, R.K. & Chaudhary, A. A novel non-linear neuron model based on multiplicative aggregation in quaternionic domain. *Complex Intell. Syst.* 9, 3161–3183 (2023). https://doi.org/10.1007/s40747-022-00911-6**

The learning algorithm for a three-layered neural structure with novel non-linear quaternionic-valued multiplicative (QVM) neurons is proposed in this paper. The computing capability of non-linear aggregation in the cell body of biological neurons inspired the development of a non-linear neuron model. However, unlike linear neuron models, most non-linear neuron models are built on higher order aggregation, which is more mathematically complex and difficult to train. As a result, building non-linear neuron models with a simple structure is a difficult and time-consuming endeavor in the neurocomputing field. The concept of a QVM neuron model was influenced by the non-linear neuron model, which has a simple structure and the great computational ability. The suggested neuron's linearity is determined by the weight and bias associated with each quaternionic-valued input. Non-commutative multiplication of all linearly connected quaternionic input-weight terms accommodates the non-linearity. To train three-layered networks with QVM neurons, the standard quaternionic-gradient-based backpropagation (QBP) algorithm is utilized. The computational and generalization capabilities of the QVM neuron are assessed through training and testing in the quaternionic domain utilizing benchmark problems, such as 3D and 4D chaotic time-series predictions, 3D geometrical transformations, and 3D face recognition. The training and testing outcomes are compared to conventional and root-power mean (RPM) neurons in quaternionic domain using training–testing MSEs, network topology (parameters), variance, and AIC as statistical measures. According to these findings,

networks with QVM neurons have greater computational and generalization capabilities than networks with conventional and RPM neurons in quaternionic domain.

Fig. Quaternionic-valued multiplicative neuron model
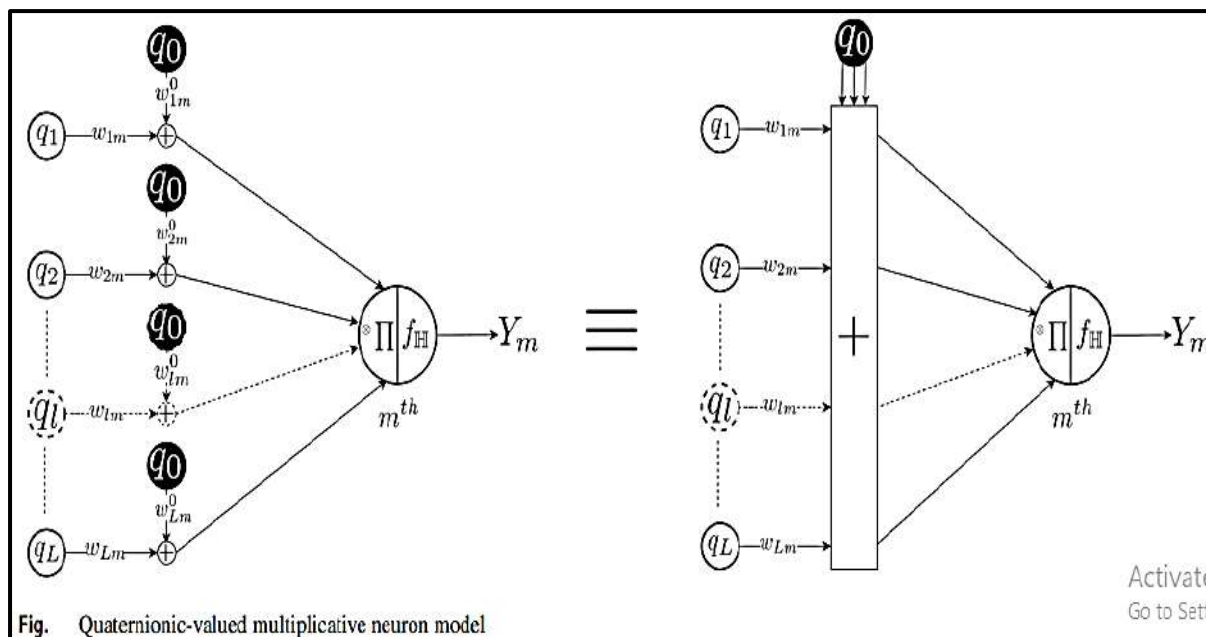
4. **Shalini Kapoor, Tarun Kumar, "Detecting emotion change instant in speech signal using spectral patterns in pitch coherent single frequency filtering spectrogram, Expert Systems with Applications", Volume 232, 2023, 120882, ISSN 0957-4174, https://doi.org/10.1016/j.eswa.2023.120882.**

Emotional intelligence means an ability to understand how others are feeling so that one can adjust according to others' emotional needs. Machines with emotional intelligence must understand human emotions as well also be informative about their emotional changes. Several researchers have tried to detect emotions from speech but little work is done in the area where machines could predict emotional changes. In the proposed work we have tried to analyze the spectrum of the glottal source to predict emotional changes. The glottal source spectrum is represented as a single-frequency filtering spectrogram. Single frequency spectrogram has high resolution in the time and frequency domain simultaneously. A single-frequency filtering spectrogram is fed to EfficientNetB7 to predict time-instant emotional changes. The performance of the proposed method is evaluated on two datasets IEMOCAP and RAVDESS. The proposed method shows high accuracy in comparison to other state-of-the-art techniques used for emotion prediction.

5. **B. Ranchay, K. Ayursh, J. Ayushi, J. Bhawna, T. Bhawna, S. Chanda, "Working women and financial literacy : A Study in Ghaziabad", Print ISSN: 0972-0510 , Online ISSN: 2169-0014, Volume 26, 2023, Issue 3, Pages 625-635, https://doi.org/10.47974/JSMS-1054**

Individuals are more concerned about education today, as we know, but literacy alone is insufficient. Financial literacy is extremely important because it enables people to make sound financial decisions, explore the financial world, & reduce their chances of being duped. Women, in particular, must be educated on this subject because they make the majority of household decisions. FL is a set of behaviors, skills, knowledge, and attitudes that enable people to make sound

The financial approach of Respondents:

	agree	disagree	Neither agree nor disagree	total
I believe that money is meant for savings.	47	7	38	92
I live today so believe that money is meant to be spent	15	49	28	92
I strongly believe in financial plans for future	80	3	9	92
I would prefer high-risk high returns investment options.	20	42	30	92

financial decisions. Women's financial health can suffer due to a lack of financial literacy. The primary goal of this paper is to investigate working women's knowledge of investment avenues, how they invest, where they invest, and for whom they invest, as well as to analyze their investment decisions regarding saving in Ghaziabad.

6.   **S. Gaurav, C. Purnashis, T. Vikrant, "Constitutive Behavior of a Homogenized AT61 Magnesium Alloy under Different Strain Rates and Temperatures: An Experimental and Numerical Investigation", Journal of Materials in Civil Engineering, Volume 35, Issue 9**, https://doi.org/10.1061/JMCEE7.MTENG-15799

The performance of a structure is primarily determined by its material characteristics under different loading conditions, strain rates, and temperatures. In the present work, the plastic flow response of a homogenized AT61 magnesium alloy was constitutively analyzed under a wide variety of quasi-static and dynamic strain rates. The quasi-compression test was conducted at 25°C–250°C with strain rates from $10{-}410^{-4}$ to $10{-}110^{-1}$ s^{-1}. The dynamic loading of AT61 alloy was performed on a split Hopkinson pressure bar (SHPB) apparatus under a strain rate of $1{,}000{-}4{,}000$ s^{-1}$1{,}000{-}4{,}000$ s^{-1}. The material shows hardening behavior throughout the strain rate regime, whereas the plastic flow stress significantly reduces with an increase in deformation temperature. At a very high strain rate, the accumulated energy around the cracks is attributed to the dynamic recrystallisation with the onset of adiabatic temperature rises in the materials. A phenomenological Johnson-Cook (JC) model was also calibrated and used for numerical simulation in ABAQUS/Explicit to predict the material flow response. It was observed that a strong correlation exists between experimental and numerical results.

Reimbursement of Conference Registration Fee

S. No	Name of Faculty	Designation	Dept.	Name of Conference	Title of Paper	Benefits/ Incentives	Published By
1.	Richa Singh	Assistant Professor	CSE (AI)	International Conference on Disruptive Technologies (ICDT-2023) Organized by GL Bajaj Technology, & Management, G.Noida	Study on Zero-Trust Architecture, Application Areas & Challenges of 6G Technology in Future.	8000	IEEE
2.	Juhi Singh	Student (III Year)	CSIT	International Conference on Disruptive Technologies (ICDT-2023) Organized by GL Bajaj Technology, & Management, G.Noida	Market Segmentation Using ML	1000	IEEE
3.	Anugya Jain	Student (IV Year)	CSIT	International Conference on Computational Intelligence, Communication Technology	SKILLDRILL: ML-Based Interview Tool	2750	IEEE

			and Networking (CICTN-2023) Organized by CSE, ABES Engg. College, Gzb			
4.	Sahil Jain	Student (IV Year)	CSIT	International Conference on Computational Intelligence, Communication Technology and Networking (CICTN-2023) Organized by CSE, ABES Engg. College, Gzb	FIR Registration by Blockchain	2750	IEEE
5.	Hritik Jindal	Student (IV Year)	ECE	International Conference on Trends in Electronics and Informatics (ICOEI 2023) organized by SCAD College of Tech, Cheranmahadevi, Tirunelveli, India	Raspberry Pi based Water Purity Monitoring Device for Domestic Application	3250	IEEE
6.	Prashant Singh	Student (II Year)	CSIT	International Conference on Computational Intelligence, Communication Technology and Networking (CICTN-2023) Organized by CSE, ABES Engg. College, Gzb	Bread and Bounty: Feel the Hunger Feed the Hungry	1000	IEEE
7.	Aaryan Singh	Student (IV Year)	CS	International Conference on Sustainable Computing and Data Communication Systems (ICSCDSI 2023)	Sentiment Analysis on User Feedback of a Social Media Platform.	3500	IEEE

				Organized by Shree Venkateshwara Hi-Tech Engg. College, Erode			
8.	Amish Mishra	Student (IV Year)	CS	International Conference on Computational Intelligence, Communication Technology and Networking (CICTN-2023) Organized by CSE, ABES Engg. College, Gzb	Prevention of Website from Cross Site Scripting	2750	IEEE

Highlights of the Published Conference Articles

1.   R. Singh, G. Srivastav, R. Kashyap and S. Vats, "Study on Zero-Trust Architecture, Application Areas & Challenges of 6G Technology in Future," *2023 International Conference on Disruptive Technologies (ICDT),* **Greater Noida, India, 2023, pp. 375-380, https://doi.org/10.1109/ICDT57929.2023.10150745.**
Intelligent network orchestration and management are crucial components of the 6G network. Therefore, machine learning and artificial intelligence play a big part in the 6G paradigm that is being imagined. However, the combination of 6G and AIML utilization may frequently be a double-edged sword because AI has the capacity to either protect or compromise security and privacy. Proactive threat detection, the use of mitigating intelligent techniques, and network automation in future are needed to enable the achievement of independent networks in 6G. As a result, this paper has detailed focus on the ongoing projects based on 6G and factors that make 6G technology necessary. The role of ZT architecture is discussed in detail, use of AIML in 6G, Various application areas and challenges associated in 6G has been mentioned in this paper.

2.   J. Singh, K. Jaiswal, M. Singh, M. Sama and S. Singhal, "Market segmentation using ML," *2023 International Conference on Disruptive Technologies (ICDT),* **Greater Noida, India, 2023, pp. 703-707, https://doi.org/10.1109/ICDT57929.2023.10150639.**
Market segmentation is an approach whose aim is to identify and outline the market segments on which an organization can target for its marketing plans. Market Segmentation is used not only for selling a commodity and various services but also plays a crucial role in meeting the customer's needs because without customers there is no business. So satisfying a customer's need is really important and hence the need for market segmentation. The general objective of this research service is to analyze various factors which influence the student's admission process in various private institutions. Various factors like teaching staff, quality of education, and facilities play an important role in influencing students while selecting a college or university. But as Technology is increasing, we can say digital advertisement also plays an important role in luring a student to select a particular college/university through various online platforms such as websites, emails, etc., and just like that several factors need consideration. So the main aim of this research is to analyze all the factors and their broad segments which can be used by various higher education managers to develop strategies and customize their plans for making their businesses more profitable. A student survey allows students to share their issues, needs, and desires, giving

feedback on how a teacher can change his or her instruction to help them perform better in class. By implementing certain measures, it is possible to enhance student engagement and motivation, resulting in better academic outcomes and higher levels of student achievement.

3.   A. Jain, S. Tibrewal, S. Jain and G. Singh, "SKILLDRILL: ML- Based Interview Tool," *2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN)***, Ghaziabad, India, 2023, pp. 390-395, https://doi.org/10.1109/CICTN57981.2023.10141210.**
Amidst the challenges presented by the pandemic, companies have had to adapt their recruitment strategies to ensure business continuity and access to the best talent. This has resulted in a shift towards virtual hiring and remote assessments, which have enabled recruiters to continue assessing and interviewing candidates while adhering to social distancing guidelines. In addition to the use of technology for virtual hiring, the pandemic has also highlighted the importance of soft skills such as adaptability, resilience, and the ability to work remotely. Remote technical assessments come in different forms, including coding challenges, live coding interviews, along with facial analysis. These assessments allow candidates to showcase their technical abilities, problem-solving skills, and creativity in a structured and standardized format. This helps recruiters to evaluate candidates fairly and objectively, while also providing a better experience for candidates. In conclusion, the pandemic has disrupted traditional recruitment practices and forced companies to adopt virtual and remote hiring strategies. While this has presented challenges, it has also created opportunities for innovation and the adoption of new technologies. As we move forward, companies will need to embrace these changes and leverage technology to attract and retain top talent in the competitive tech industry.

4.   S. Agarwal, S. Jain, V. Singh and G. Singh, "FIR Registration System Using Blockchain," *2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN)***, Ghaziabad, India, 2023, pp. 426-430, https://doi.org/10.1109/CICTN57981.2023.10141106.**
In a research paper on FIR registration by blockchain, the authors may explore the potential benefits of using blockchain technology to register and manage FIRs. Enhanced security and tamper-resistance are two potential advantages of adopting blockchain for FIR registration. This means that the information contained in a blockchain-based FIR system would be more secure and less likely to be altered or corrupted. The research paper on fir registration by blockchain proposes a new method for registering first information reports (FIRs) using blockchain technology. The traditional method of FIR registration, which involves manual paperwork and recordkeeping, is prone to errors and can be time-consuming. This system addresses the current challenges faced in traditional FIR registration and provides an improved solution through the use of blockchain technology. The data entered is secure, tamperproof and can only be accessed by authorized parties. The efficient and transparent nature of this system provides a significant improvement over the traditional methods. The results show that the blockchain-based FIR registration system is able to provide a reliable and efficient means of recording and accessing critical information.

5.   I. Bhardwaj, H. Jindal, K. Sharma, P. Singh and S. Sharma, "Raspberry Pi based Water Purity Monitoring Device for Domestic Application," *2023 7th International Conference on Trends in Electronics and Informatics (ICOEI)***, Tirunelveli, India, 2023, pp. 1584-1588, https://doi.org/10.1109/ICOEI56765.2023.10125867.**
In this research study, various water purity parameters such as turbidity, pH, temperature, etc. are measured. Different types of technologies with their importance, merits and applications are also studied and analyzed. Theses parameters are necessary for correct evaluation of any water body in different circumstances such as heavy flood, drought of water bodies. After analyzing the present available solutions, paper suggest some loT based low-

cost, verified techniques according to user need to check water quality in real-time to prevent water contamination.

6. **P. Singh, P. Sahgal, S. Deshmukh and R. Vashisht, "Bread and Bounty : Feel the Hunger Feed the Hungry,"** *2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN)*, **Ghaziabad, India, 2023, pp. 326-332, https://doi.org/10.1109/CICTN57981.2023.10140855.**
Food loss and waste have increased significantly over the past approximately ten years, putting the world's population at risk of a developing food catastrophe in the coming century. This assessment of literacy is being done to see how much research is being done on waste and loss of food and what approaches are most frequently employed. Inside this study, we work to end hunger in society by providing for the underprivileged and utilising food in the right ways. However in the near, we could be able to transform food scraps into a useful and cost-effective energy source. Therefore, with the aid of our concept, we also hope to lessen food waste while serving as a source of recyclable energy and thereby improving the environment.

7. **A. Singh, H. Srivastava, M. Aman and G. Dubey, "Sentiment Analysis on User Feedback of a Social Media Platform,"** *2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)*, **Erode, India, 2023, pp. 826-832, https://doi.org/10.1109/ICSCDS56580.2023.10105082.**
The paper proposes a methodology for implementing Sentiment Analysis on user feedback of a social media website named "DevelopersBay". This study has performed a sentiment analysis of user feedback received on the website by using basic machine learning method and BERT model of deep learning. The process of sentiment analysis utilizes algorithms to evaluate the tone of feedback, indicating whether it is positive, negative, or neutral. This information is then used to enhance the quality of the services or products provided by the organization. In our research we found the deep learning method to be more accurate in determining the sentiment of the feedback received on the website. The results obtained from sentiment analysis help us improve our website to meet the needs of our users.

8. **A. Mishra and S. Juneja, "Prevention of Website from Cross Site Scripting,"** *2023 International Conference on Computational Intelligence, Communication Technology and Networking (CICTN)*, **Ghaziabad, India, 2023, pp. 471-473, https://doi.org/10.1109/CICTN57981.2023.10140659.**
The Web is an enormous part of many organizations and business activities. It holds hefty amount of confidential data which needed to be secured. Most Common vulnerability threat in Website hacking is Cross Site Scripting. Around 40% attacks on Websites globally occurred due to XSS (Cross Site Scripting). Cross Site Scripting targets both vulnerable and non-vulnerable website. To protect and prevent the website from XSS we must know the complexity and different ways of prevention. However, the research of finding the optimal way of detection of Cross Site Scripting is still in progress. XSS attacks can also be used to steal user information, such as cookies or session tokens, which can be used to gain access to the victim's account. XSS can also be used to inject malicious code into a page, which can be used to redirect the user into the malicious sites, or to execute malicious code on the user's machine. However, in this paper we will be focusing on XSS attacks and its types. In addition, this paper will introduce some techniques to prevent user's data from XSS attacks.

Research Incentive for Book Chapters

S.No	Name of Faculty	Designation	Dept.	Category	Title of Book Chapter	Benefits/ Incentives	Published By
1.	Dr. Arunesh Chandra	Professor	ME	Book Chapter	Ergonomic Assessment of Tractor Seat for Anthropometric Dimensions of Indian Population	2000	Springer

Research Incentive for FDP/QIP

S.No	Name of Faculty	Designation	Dept	Category	Name of the FDP/QIP	Benefits/ Incentives	Published By
1.	Mr. Sachin Rathore	Assistant Prof.	ME	Reimbursement for Seminar Registration Fees & TA	Design Thinking and Innovation	1000 & TA as per College Norms	Seminar
2.	Dr. Vaishali Maikrao Patil	Associate Prof.	KSOP	Reimbursement for Seminar Registration Fees & TA	Combination of QSAR and Molecular Docking Studies: Flavonodies as HCV NS5B Polymerase Inhibitors in 20th International Workshop	1000 & TA as per College Norms	Worskshop Fee
3.	Shikha Kaushik	Assistant Prof.	KSOP	Reimbursement for Seminar Registration Fees & TA	QSAR Studies on some series of Phosphodiesterase 4 Inhibitors	1000 & TA as per College Norms	Workshop Fee

Faculty Articles

The Symbiosis of AI and 6G: Paving the Way for the Future of Communication

As the world stands on the edge of the 6G era, the integration of Artificial Intelligence (AI) into communication networks is set to redefine the landscape. While 5G began the journey of intertwining AI with telecom, 6G promises to elevate this union to unprecedented heights. At the heart of 6G's vision is the aspiration for intelligent network management. With the intricate web of modern communication networks, AI emerges as the linchpin for automating operations, ensuring predictive maintenance, and fostering self-optimization. The goal? An improved user experience that anticipates needs and tailors' services in real-time. But the AI-6G alliance does not stop there. It extends to advanced beamforming, optimizing the directional transmission or reception of signals, especially crucial in Massive MIMO scenarios. Furthermore, in an age where cyber threats loom large, AI stands as the sentinel guaranteeing robust security by detecting anomalies and proactively countering potential threats. One of the standout features of 6G will be its commitment to edge computing. Here, AI takes center stage, streamlining data processing closer to its source, ensuring reduced latency and a seamless user experience. Additionally, with spectrum becoming an increasingly scarce resource, AI's prowess in dynamic spectrum sensing and allocation will be invaluable. The future also envisions a world where communication solutions are not one-size-fits-all but tailored to specific industries. Be it healthcare, manufacturing, or agriculture, AI's adaptability promises customized solutions that cater to niche needs. As 6G beckons, it brings with it the promise of a world where AI is not just an adjunct but an integral driver of innovation. The constructive collaboration between AI and 6G is not just desirable but essential, heralding a new dawn in the realm of communication.

Dr. Abhishek Sharma
Associate Professor
Electronics and Communication Engg. Department

Effects of the Open Dumpsites

Open dumpsites are significant contributors of anthropogenic methane gas. Since a considerable portion of waste in India is biodegradable, municipal solid waste when disposed of in dumpsites or landfills, emits methane for years, even if the landfill is closed. The global warming potential of methane is 28 times higher than that of carbon dioxide. The unsustainable and mismanaged biodegradable waste, when anaerobically decomposed naturally, generates methane which is flammable in nature as well. This results in frequent fire outbreaks, which further burn the plastic that contains chlorine-containing waste. The burning of plastic and chlorine-containing results in the emission of most toxic gases like dioxins, furans, and PCB. This makes the surrounding local environment unsuitable for life to survive. Mitigation strategies for minimizing methane emissions from dumpsites by

biomining and bioremediation is the new scope and by ensuring scientific treatment of biodegradable waste generated across the country. Moreover, the treatment facility may also include bioremediation of biodegradable waste through composting, vermicomposting, etc. The change in lifestyle for the environment is also required to bring transformation in the environment through transforming the self, like adopting practices such as segregation of biodegradable and non-biodegradable waste at the source of generation only.

Dr. Minakshi Karwal
Associate Professor
Applied Science Department

Shaping India's agricultural legacy for next 25 years

India is often considered one of the most productive agricultural countries in the world. More than half the people depend on agriculture and the industries that support it for their livelihood. The nation is one of the largest producers of food based on crop production and has the second-largest agricultural land area in the world after China. Agriculture accounts for about 12 per cent of the total annual value of all domestic merchandise exports, placing it among the top 10 agricultural exporting countries in the world. However, India is facing a significant technology gap in its agriculture sector. Despite its impressive agricultural production and diverse crop portfolio, the region faces several significant challenges related to technology adoption and integration.

1. Limited access to modern farming equipment: A large section of India's farming community still depends on traditional farming methods, lacking access to modern farming equipment and machinery. This hampers efficiency, leading to lower yields and increased labour demand.

2. Inadequate digitization: The digital revolution that has transformed agriculture in many countries is still in its infancy in India. Access to real-time data on weather, soil health and market prices is limited, hindering farmers' ability to make informed decisions.

3. Irrigation Challenges: Efficient water management is important in a country with monsoon-dependent agriculture. However, many farmers still practice flood irrigation instead of adopting advanced technologies like drip or sprinkler irrigation, resulting in a waste of water.

4. Crop monitoring and pest control: Integrated pest management and crop monitoring through satellite technology is underutilized in Indian agriculture. As a result, pest infestations and crop diseases often go undetected until significant damage has been caused.

5. Disparities in knowledge: There is a huge gap in knowledge among farmers regarding the use of modern agricultural technologies, sustainable practices, and agri-tech solutions. Access to agricultural extension services and training remains unequal.

mint Premium | OPINION

Shaping India's agricultural legacy for next 25 years

Balram Singh Yadav | 4 min read | 05 Aug 2023, 09:39 AM IST

Technology and innovation are slowly and steadily enriching the agri space. Istock

SUMMARY

- *While we are educating farmers about new farming and sustainable practices, we should simultaneously encourage the young to enter the agribusiness and become agricultural entrepreneurs*

6. Infrastructure constraints: Limited rural infrastructure, including roads and cold storage facilities, increases post-harvest losses and reduces the shelf life of perishable crops.

Bridging this technology gap is essential to increase productivity, reduce resource wastage and ensure food security for India's growing population. Government initiatives, private sector collaboration and increased awareness among farmers are important in bridging this divide and taking Indian agriculture into a technologically empowered era.

Dr. Brijesh Singh,
Associate Professor (EEE)
(The article is the author's own opinion and is inspired by news published on Mint dated 05 Aug, 2023)

Innovation Spotlights of the Month

Redefining Radar Technology: The Promise of GLRT and MFLRT Detectors in the Field of Advanced Signal Processing and Precision Navigation

In the intricate world of radar technology, mutual coupling among array elements has historically posed significant challenges. This phenomenon, which might seem esoteric to the layperson, can lead to distortions in target detection and bearing estimation, undermining the very essence of radar's purpose. However, as we navigate the complexities of the 21st century, where precision and rapid response are paramount, the landscape of radar detection is undergoing a transformative change. The introduction of the Generalized Likelihood Ratio Test (GLRT) and the Multifamily Likelihood Ratio Test (MFLRT) detectors is at the forefront of this revolution.

The GLRT and MFLRT detectors have been meticulously designed to factor in the Uniform Linear Array (ULA) and the nuances of mutual coupling. By doing so, they promise to redefine the benchmarks in radar detection. But what makes them truly stand out is their data-driven approach. In an age where data is often termed the 'new oil,' these detectors harness the power of analytics to ensure not just innovation but also unprecedented precision. Through rigorous testing and comparative analysis against existing benchmarks, researchers have underscored the transformative potential of these tools. The results are clear: considering mutual coupling, once a sidelined phenomenon, is now essential for optimal radar performance.

While the instantaneous consequences of these detectors might seem to be limited to the military and defense industries, their larger applications are broad and profound. Consider a world in which autonomous vehicles navigate busy metropolitan streets with pinpoint accuracy, making split-second judgments that preserve the safety of both passengers and pedestrians. Consider drones that can fly in densely crowded airspaces, delivering crucial supplies or performing surveillance without the risk of colliding with other aircraft. All of these situations, which were previously the stuff of science fiction, are becoming more conceivable as a result of the accuracy provided by the GLRT and MFLRT detectors.

But the potential doesn't stop there. In maritime applications, where vast oceans and unpredictable weather patterns pose challenges, these detectors can enhance ship navigation and detection systems. In aerospace, as we look to the stars and consider the future of space exploration, the ability to detect and navigate around space debris becomes crucial. The GLRT and MFLRT, with their advanced capabilities, could very well be the tools that safeguard our astronauts and satellites in the vast expanse of space.

Furthermore, as we delve deeper into the age of the Internet of Things (IoT) and smart cities, the importance of accurate detection systems becomes even more pronounced. From managing traffic flows to ensuring the timely response of emergency services, the applications of these radar technologies in urban planning and management are immense.

In conclusion, as our world becomes more interconnected and reliant on technology, the innovations in radar detection symbolize more than just technical advancements; they represent a commitment to safety, efficiency, and progress. The GLRT and MFLRT detectors, with their promise of unparalleled accuracy in radar detection, are not just tools but harbingers of a brighter, safer future. As we continue to push the boundaries of what is possible, it's innovations like these that will guide our way, ensuring that technology serves humanity in the best way possible. In a world where every millisecond and every degree of accuracy can be effective, the promise of the GLRT and MFLRT detectors shines brightly, heralding a new era in radar technology.

By: Dr. Abhishek Sharma, Associate Professor, ECE Department

<u>Innovations in Quantum Computing</u>

Quantum computing is an exciting field that has seen significant innovations and advancements in recent years. Here are some key innovations and developments in quantum computing:

Quantum Supremacy: In 2019, Google claimed to have achieved "quantum supremacy" by demonstrating that its quantum computer, Sycamore, could perform a specific task faster than the world's most advanced classical supercomputers. While the practical implications are still being explored, this milestone marked a significant advancement in the field.

Noisy Intermediate-Scale Quantum (NISQ) Devices: NISQ devices are quantum computers with a limited number of qubits (typically fewer than 100) and high error rates. Innovations in error correction and quantum algorithms have enabled researchers to perform meaningful computations with these devices, paving the way for practical applications.

Quantum Error Correction: Quantum error correction codes and techniques have been developed to mitigate the impact of errors in quantum computations. Innovations in error correction are crucial for building fault-tolerant quantum computers capable of solving complex problems.

Quantum Software and Algorithms: Researchers are continually developing new quantum algorithms and software tools to harness the power of quantum computers. These include algorithms for optimization, cryptography, and machine learning that could revolutionize various industries.

Quantum Hardware: Companies like IBM, Google, Rigetti, and others are actively working on improving the design and stability of quantum hardware. Advances in qubit technology, quantum gates, and cooling systems are making quantum computers more reliable and accessible.

Quantum Cloud Services: Several companies are offering cloud-based access to quantum computers, making them available to researchers, developers, and businesses worldwide. This democratizes access to quantum computing resources and accelerates research and innovation.

Quantum Networking: Quantum networking and communication technologies are being developed to enable secure quantum communication over long distances. Quantum key distribution (QKD) and quantum teleportation are key components of these innovations.

Quantum Simulators: Quantum simulators are specialized quantum computers designed to simulate complex quantum systems, such as molecules and materials. These simulators have applications in drug discovery, materials science, and fundamental physics research.

Hybrid Quantum-Classical Systems: Many quantum computing applications involve hybrid systems that combine quantum and classical computing resources. Innovations in integrating these two paradigms enable more efficient problem-solving.

Quantum Education and Workforce Development: Educational programs and initiatives are emerging to train the next generation of quantum scientists and engineers. These efforts are crucial for building a skilled workforce capable of advancing quantum computing technologies.

Quantum computing is still in its early stages, and many challenges remain to be addressed, including error correction, scalability, and practical applications. Nonetheless, these innovations represent significant progress in the field and hold the promise of transformative changes in various industries in the coming years.

Technology Innovations Changing Pharmacy

Automation and robotics for sorting, packaging and dispensing

From sorting and pill counting to adherence packaging and dispensing, automation and robotics technology can streamline virtually every stage in the pharmacy workflow to save time, reduce errors and prevent narcotics theft.

Wayne Caverly, founder and president of Caverly Consulting Group in St. Lazare, Que., cites RxSafe— made in Vista, California—as one example of robotic platforms that eliminate manual labour from many of the day-to-day activities that take place in pharmacies.

"So much of a pharmacy's resources and time are taken up with dispensing and inventory management—tasks that can easily be automated with robotics". "One of the big barriers is cost, which is why it's usually the high-volume stores that adopt them.

Automated storage and retrieval lockers

Today, automated locker technologies provide a secure way for patients to retrieve their prescription medications after pharmacy hours, or even from a non-pharmacy location such as an office tower.

"They're like a PenguinPickup for pills". These would be most useful not as a means to connect with pharmacy but more to provide a secure and convenient way for a pharmacy to deliver prescriptions to multiple customers in one location.

How do these lockers work? With one particular product—the ServiLocker from Winnipeg-based Manrex Ltd.—prescriptions are scanned and loaded into a temperature-controlled locker with 162 separate compartments secured by robotically powered doors. To retrieve their medications, patients unlock the door by entering a code provided by their pharmacist into a control panel.

ServiLocker is available in a two-sided version that can be installed through a wall, with one panel inside the pharmacy for loading and the other panel outside the pharmacy for retrievals.

Sources: www.canadianhealthcarenetwork.ca

Saltwater: The future of green hydrogen production

Scientists from the Department of Physics at the Indian Institute of Technology (IIT) Madras have successfully developed a low-cost prototype that harnesses the power of seawater to generate green hydrogen (GH2). Currently, India relies on six million tonnes of grey hydrogen derived from natural gas, but transitioning to green hydrogen would require 132-192 million tonnes of water. Researchers worldwide are exploring desalination and direct seawater usage as means of producing GH2. While desalination yields clean water suitable for GH2 production, the process of seawater splitting poses significant challenges. Renewable-powered electrolysis has been utilised, but the high costs of desalination hinder efficient electrolysis. Although the technology readiness level (TRL) of seawater-based green hydrogen production is currently low, ongoing efforts are advancing its TRL and evaluating its techno-economic viability. Commercial viability may take several years to determine, but the potential of seawater hydrogen production is promising. The technology also encompasses the exploration of wastewater utilisation, including experiments with industrial wastewater.

Sources: https://www.efymag.com/express/ - August Month EFY Magazine

Can robots learn from videos?

Researchers at Carnegie Mellon University have enabled robots to learn household chores by watching home videos of people performing everyday tasks. The researchers have enhanced home robot utility, enabling cooking, cleaning, and more assistance. The team's research demonstrated that it can acquire a new task in as little as 25 minutes. This model opens possibilities for robots to venture into the surrounding world with a sense of curiosity. To guide the robot in understanding object interaction, the team incorporated the idea of affordances, drawing from psychological principles. In the virtual robotic behaviour (VRB) context, affordances serve as guidelines for determining the location and manner in which a robot can interact with an object, drawing insights from human behaviour. The

A team from Carnegie Mellon University's Robotics Institute used affordances to teach robots how to interact with objects (Credit: Carnegie Mellon University)

researchers believe that this research can help robots learn from online videos.

Sources: https://www.efymag.com/express/ - August Month EFY Magazine

Nanosheet technology for energy storage dielectric capacitors

Scientists at the National Institute of Standards and Technology (NIST) have created a device with two superconducting qubits, quantum counterparts of classical computer bits. A 'toggle switch' connects the qubits to a 'readout resonator' circuit. The researchers aim to maintain undisturbed yet readable outputs, safeguarding qubits and enhancing measurement fidelity for quantum processors. Quantum computers exploit quantum mechanics for complex tasks like drug development. Designers face noise issues affecting quantum circuits. The toggle switch overcomes problems by blocking circuit noise and preventing undesired qubit interactions. Remote-controlled microwave pulses replace physical connections in a static architecture, enabling a programmable quantum computer. More toggle switches enhance versatility while facilitating logic operation order and simultaneous qubit

Central working region of the device (Credit: K. Cicak and R. Simmonds/NIST)

measurement. The toggle switch, made from a sensitive SQUID device, interacts with qubits and the readout resonator via microwave current.

Sources: https://www.efymag.com/express/ - August Month EFY Magazine

KIET (R&D) Policies

Promotion of research culture with the formulation of policies by the R&D Committee are 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

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 OD is 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.
- Published paper must have 'KIET Group of Institutions, Delhi-NCR, Ghaziabad.
- 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.
- Details of the knowledge sharing session must be submitted while making the claim (Annexure III (b)).
- 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, II and IV years, the institute will reimburse Rs. 1000 or T.A (as per Institute policy), registration fees whichever is less.

Presentation of Research Papers in Conferences Abroad

- The faculty must approach AICTE (which provides 100% funding subject to meeting their norms) or other funding agencies of the Govt. of India.
- It has been observed that some of the proposals may not meet AICTE norms, besides the paucity of funds, because of their all-India scope. Therefore, KIET may also consider funding for international conferences on a case-to-case basis, subject to 60% being paid

by the candidate and 40% by KIET, with the candidate having at least 5 years of service in KIET. Also, the candidate should register for a Ph.D. after coming as soon as possible.

- This sanction would be allowed depending upon the track record of the faculty member to be adjudged by a panel of at least four research and development.
- 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.
- Published papers must have "KIET Group of Institutions, Delhi-NCR, Ghaziabad" as the affiliation.
- 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)).

For Attending Workshops/ Seminar/ FDPs

- The faculty would be allowed OD+ Registration+ T.A. on an actual basis or Rs. 10,000/- whichever is less.
- The Workshops/Seminars/FDPs hosting institutions must be institutes of repute (IITs/IISc/NITs/IITs/Universities/Deemed Universities etc.).
- Each faculty member can attend workshops/seminars/FDPs of repute twice in an academic year with financial assistance. However, financial assistance is limited to Rs. 10,000/-only.
- The maximum number of ODs is limited to one week during the lean period. Only one one-day OD is allowed in the academic period.
- The clause of "minimum requirement of 6 months of service in KIET" stands discontinued for claiming any research-related incentives or OD for attending workshops, seminars, or FDPs etc.
- Faculty who attends FDPs outside the university must disseminate knowledge and information by organizing faculty development program (FDP) and student development programs (SDP)/student workshops/summer/winter schools, among other things, for the benefit of faculty and students in their respective departments.
- The OD and registration claim under the Research Incentive Schemes (RIS) of KIET must be made within a month in the prescribed form (Annexure IV (a)).
- Details of the knowledge sharing session must be submitted while making the claim (Annexure IV (b)).

Note: All the Annexure are found in the KIET website under the Research Tab.

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

Various Research Labs in KIET

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

Centres of Excellence

A Glimpse of Collaborative Research and Development Presentation

SRINIVASA RAMANUJAN
(22 DECEMBER 1887 - 26 APRIL 1920)
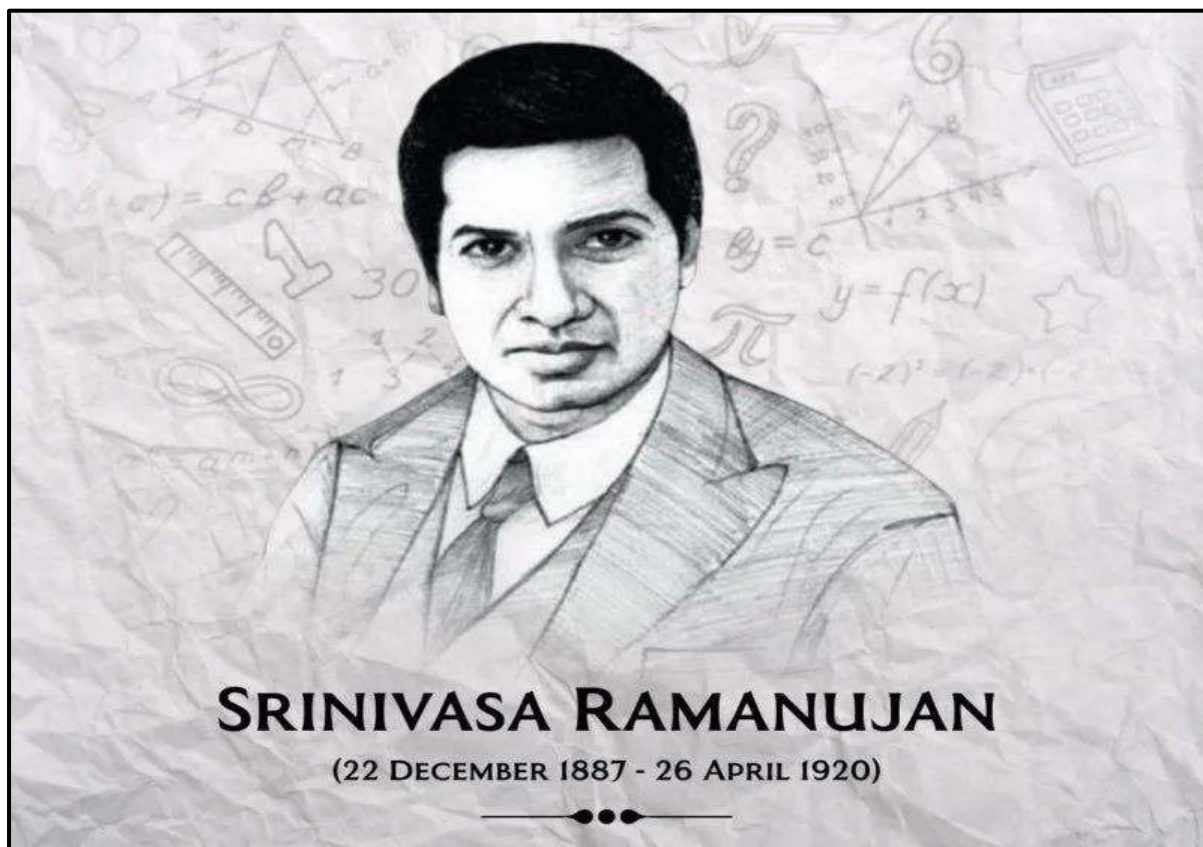
Srinivasa Ramanujan (1887-1920) born in southern part of India is one of the greatest mathematicians of all time.

His love for mathematics proved to be a disadvantage when he reached college. As he continued to excel in only one subject and kept failing in all others. This resulted in him dropping out of college.

However, S. Ramanujam continued to work on his collection of mathematical theorems and did not keep all his discoveries to himself but continued to send his works to international mathematicians.

In 1912, he was appointed at the position of clerk in the Madras Post Trust Office, where the manager, S.N. Aiyar encouraged him to reach out to G.H. Hardy, a famous mathematician at the Cambridge University

In 1913, He had sent the famous letter to Hardy, in which he had attached 120 theorems as a sample of his work.

Hardy along with another mathematician at Cambridge, J.E. Littlewood **analysed his work and concluded it to be a work of true genius.**

In 1997, ***The Ramanujan Journal*** was launched to publish work "in areas of mathematics influenced by Ramanujan".

Since 2021, His birth anniversary, **December 22, is observed as the National Mathematics Day** every year in India.

KIET Group of Institutions

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