Cover Story:

22 Faculty Members of Chitkara University Featured in the Stanford University's Top 2% Scientists List 2024

11 of these 22 faculty members are from CURIN and CRIO

Highlights of Q3, 2024

- 20+ academic events organized — workshops, FDPs, hackathons, seminars, etc.
- 500+ delegates participated in 2 engineering conferences of Chitkara University
- 123 research publications and 22 patents filed by CURIN and CRIO
- 42 patents granted to Chitkara University
- 85 scholars received their doctoral degrees

Forging Collaborations — Launch of an Academic Journal with Springer Nature

Insights — Impactful Funded Research; 2 New Funded Projects in Q3

www.curin.chitkara.edu.in

CURIN – Chitkara University Research and Innovation Network
CRIO – Center for Research Impact and Outcome

CONTENTS

EDITORIAL TEAM

Editor
Dr. Sagar Juneja - *Associate Director (Research)*

Assistant Editor
Dr. Vatsala Anand - *Assistant Professor, CURIN*

Proofreader
Chanpreet Singh - *Project Manager, CURIN*

Lead Designer
Neeraj Pandey - *Chitkara University*

Content Manager
Lovit Kumar - *Assistant Manager, CURIN*

Editorial

At the outset, I wish to congratulate all my fellow colleagues at Chitkara University who have featured in Stanford University's Top 2% Scientists List 2024. Your achievement is a great encouragement for all of us to follow suit. Notably, 22 faculty members from Chitkara University are featured in this coveted list, of which 11 are from CURIN and CRIO. The cover story of the current edition of the newsletter highlights the research contributions of these 11 faculty members of CURIN and CRIO.

In the first-of-its-kind partnership in India, Chitkara University has collaborated with Springer Nature and launched an academic journal, which is a significant milestone in the research excellence journey of Chitkara University. Additionally, we forged many more collaborations for the advancement of research, which are presented in one of the important stories in the newsletter. We successfully conducted two major engineering conferences with the mighty participation of researchers from all over the globe.

The insights story of the newsletter talks about our continuous efforts in securing government funding to carry out meaningful projects that create a difference. In Q3, two funded projects have been sanctioned to Chitkara University. Congratulations to the PIs and Co-PIs.

Finally, in this issue, you will find details of a large number of activities carried out by different groups in CURIN and CRIO on several latest technologies and tools for capacity building and skill development and to promote ethical research and research awareness, innovation, and entrepreneurial spirit in the university.

We sincerely hope that our readers will find this issue of Res Novae resourceful. Most of our events and activities are open to all those who are interested in participating in them. Please get in touch if you are interested in participating in our activities.

Thanks,

Sagar Juneja, PhD
Editor, Res Novae

22 Faculty Members of Chitkara University Featured in the Stanford University's Top 2% Scientists List 2024

11 of these 22 faculty members are from CURIN and CRIO

By Dr. Sagar Juneja – Editor, Res Novae

Chitkara University is one of the top universities in the world that is known for its research prowess and excellence. Our researchers are committed on doing meaningful and high impact applied research that is making a difference. The fact that Chitkara University has over 11,500 publications in top journals and conferences and filed over 3000 patents, of which 750+ have been granted is a testimony to the above statement. It is no surprise that as many as 22 faculty members from Chitkara University have featured in the Stanford University's Top 2% Scientists List 2024 that was released in September 2024. Last year in 2023, 9 faculty members from Chitkara University made it to this prestigious list, and this year witnessed more than 100% jump in our representation on this coveted list.

The purpose of Stanford University's Top 2% Scientists List is to recognise influential researchers across the globe using a standardised method on the basis of different citation metrics, including h-index, co-authorship, and adjusted citation counts. Researchers across 22 scientific fields and 174 subfields are ranked using the data collected from the Scopus database of Elsevier.

22 faculty members of Chitkara University who made it to this prestigious list from different departments of the university include Dr. Arun Lal Srivastav, Dr. Vinay Kukreja, Dr. Shalli Rani, Dr. Urvashi Tandon, Dr. Inderbir Singh, Dr. Somdutt

Mujwar, Dr. Gurjeet Singh Thakur, Dr. Jaya Madan, Dr. Manish Sharma, Dr. Amit Mittal, Dr. Kalpna Guleria, Dr. Bhisham Sharma, Dr. Deepam Goyal, Dr. Jaiteg Singh, Dr. Rahul Pandey, Dr. Manjinder Singh, Dr. Vatsala Anand, Dr. Amarjot Kaur, Dr. Vandana Mohindru Sood, Dr. Raj Gaurang Tiwari, Dr. Gaurav Gupta, and Dr. Saurav Dixit. They were felicitated and rewarded by Dr. Madhu Chitkara - Pro-Chancellor, Chitkara University, who expressed her pride in the achievements of the university's researchers, emphasising the institution's vision of empowering its faculty and students to push the boundaries of science. She highlighted that the recognition from Stanford University and Elsevier reflects the rigorous academic culture that Chitkara University cultivates, encouraging interdisciplinary research and collaboration.

Of these 22 faculty members 11 are from CURIN and CRIO. The details of their research areas are as follows.

1. Dr. Amit Mittal (Pro-Vice Chancellor, Research Programs, Chitkara University) contributes significantly to the fields of e-commerce, leadership, emerging markets, consumer behaviour, and employability. His work offers valuable insights that enhance academic discourse and practical applications in the business world. By developing diverse frameworks, Dr. Mittal highlights effective strategies for sustainable growth and adaptation in the rapidly changing environments.

2. Dr. Vinay Kukreja (Director, Research, CRIO) specialises in the areas of machine learning (ML), deep learning (DL) and image processing. These core areas, central to technological advancement, have positioned him as a leading figure in modern artificial intelligence (AI) and image analysis research. His Field-Weighted Citation Impact (FWCI) of 6.89 signifies that his research contributions are cited 6.89 times more than the global average in the same field.

3. Dr. Manish Sharma (Director, Research, CURIN) has been featuring on Stanford University's Top 2% Scientists List for last four years now. His research interests include computational electromagnetics, reconfigurable antennas, novel electromagnetic materials, and antenna design using ML and AI techniques.

4. Dr. Shalli Rani (Director, Research, CRIO) works in the area of wireless sensor networks (WSNs), Internet of Things (IoT), and green cloud computing. With over 4,251 citations, h-index of 31, and i10-index of 89, her work is widely recognised in the academic community. Her most cited paper, A novel scheme for an energy-efficient internet of things based on wireless sensor networks, has garnered 241 citations so far.

5. Dr. Kalpna Guleria is working as Professor (Research) at CURIN, and her research interests include computer vision, ML, DL, federated learning, WSNs, vehicular ad-hoc networks, and IoV. Her recent research focuses on federated deep learning-based intelligent frameworks for privacy-preserved healthcare systems. Currently, she is working on distributed privacy-preserved federated deep learning frameworks for pneumonia detection in chest X-ray images and privacy-preserved collaborative federated learning frameworks for the automated detection of ocular diseases.

6. Dr. Bhisham Sharma (Associate Professor, Research, CRIO) works in the areas of WSNs, IoT, medical image processing, AI, DL, ML, and edge computing. With 14 years of teaching and research experience, he has published over 100 papers in prestigious SCI and Scopus-indexed journals and conferences and serves in editorial roles of several reputed journals.

7. Dr. Urvashi Tandon (Associate Professor, DRC, CBS) focuses on the technological adoption across diverse domains like e-shopping, e-health, and e-learning. By investigating the impediments and facilitators of technology adoption across diverse sectors and populations, her research contributed to the development of tailored frameworks that significantly enhance user engagement and operational efficiency.

8. Dr. Vatsala Anand is working as an Assistant Professor (Research), CURIN, and her research interests include DL, ML, and computer vision. She has published 162 research papers and articles in national and international journals and conferences. Her most cited paper, Fusion of U-Net and CNN model for segmentation and classification of skin lesion from dermoscopy images, has already received 164 citations.

9. Dr. Jaya Madan (Assistant Professor, Research, CRIO) has been featuring in Stanford University's Top 2% Scientists List for the last three years now. She specialises in the design and simulation of semiconductor devices, including solar cells and FETs. Her work on lead-free perovskite solar cells and advanced tunnel FETs has driven significant improvements in device efficiency and performance.

10. Dr. Rahul Pandey (Assistant Professor, Research, CRIO) focuses on the design and development of high-efficiency perovskite solar cells. His research is focused on improving the stability and efficiency of perovskite solar cells through novel material engineering and device fabrication techniques.

11. Dr. Deepam Goyal (Assistant Professor, CURIN) has expertise in the fields of condition monitoring, machine fault diagnostics, vibration analysis, optimisation techniques, manufacturing technology, sensors, and artificial intelligence. To his credit, he has 28 SCI-indexed journal articles, over 55 conference papers, and 8 book chapters.

Featured Research

Top Research Papers of the Quarter by CURIN and CRIO
(Published during July-September 2024)

Faculty members and research scholars from CURIN and CRIO publish high-quality research articles in top peer-reviewed journals and conferences. In this section of the newsletter, we select high impact research papers from CURIN and CRIO and attempt to discuss them in the form of short summaries.
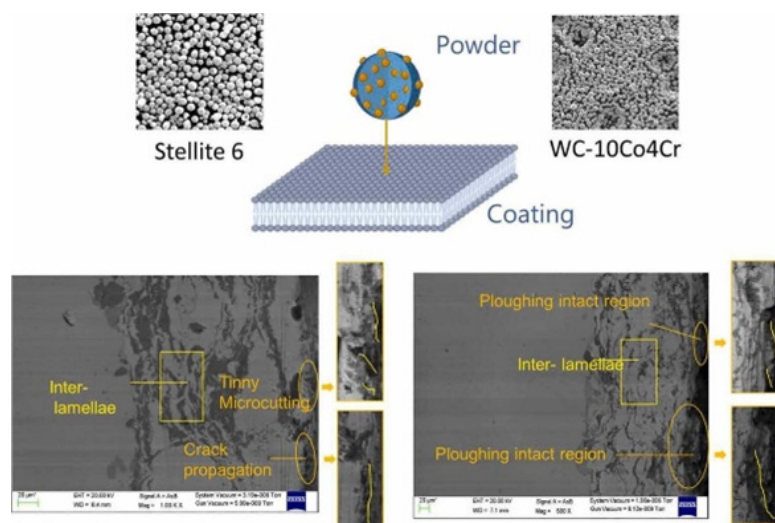
The research papers discussed in this issue are the ones that were published during July-September 2024. The complete list of publications by CURIN and CRIO faculty members and scholars during this period is available in a separate section.

Artificial neural network model for the study of thermal spray coatings used in critical industrial applications

By: Dr. Jitendra Kumar Katiyar - Assistant Professor, CRIO

This article is based on the research paper titled 'Artificial neural network model for wear characteristic analysis of WC-10Co4Cr and Stellite 6 thermal spray coatings' published by Dr. Jitendra Kumar Katiyar, Assistant Professor, CRIO, Chitkara University, Punjab in Elsevier journal entitled Tribology International.

To withstand extreme environments, industries such as aerospace, automobile, metal forming, machining, power generation, etc., look for advanced coatings. The performance of the coating is widely dependent on the process parameters, applied method and environmental conditions. Therefore, it is necessary to select a suitable coating process along with suitable materials. To reduce the number of experiments in the selection of optimum concentration and material, the researchers have introduced the use of artificial neural network (ANN). In this paper, thermally sprayed coating of WC-10Co4Cr and Stellite 6 materials was investigated for their wear performance using ANN. A sample having dimensions of 6.5 cm × 2.5 cm was prepared using high-velocity oxy-fuel (HVOF) coating techniques. The developed coating was tested for wear performance using a slurry erosion wet tester (Model: TR-401, Ducom Instruments Bangalore). Further, to minimize the number of iterations and for accurate prediction, ANN techniques were used. In this study, 70% of the data was used as training data, and 15% of the data set was used for validation. Finally, it is ensured that the overfitting error should be avoided using the validation dataset.

The illustration has been borrowed from the published paper

The ANN model uses one hidden layer, two layers with eight input neurons and one output. The coating was also tested for hardness and surface morphology using Vickers microhardness tester and scanning electron microscope, respectively. The results reveal that WC-10Co4Cr coating shows excellent hardness properties compared to Stellite 6 and base material. Further, the X-ray diffraction analysis reveals several crystalline phases in WC-10Co4Cr coating, such as WC, W_2C, Cr and Co. Moreover, in Stellite 6 coating, the hard phase of the Co with the crystalline phase was observed. The slurry erosion wear test reveals an excellent erosion rate that is ~7.5 times higher compared to the pure substrate. It was also noticed that the proposed ANN model predicts accurate results ($R2$: 0.98) compared to other regression mod-

els. The worn-out surface morphology shows that the micro-cutting, cracks, and intact regions are responsible for wear directly, but the ploughing and craters are responsible for wear indirectly as a secondary wear mechanism.

It has been concluded from this study that ANN has the potential to predict the wear performance of coating accurately with minimum coat and time and it provides an optimum concentration of coating materials. Further, this method can also be used in the prediction of lifespan of materials. This study can be applied in identifying the erosion rate in turbines, boilers, and pipelines.

Geriatric Formulation Development: Nutrient-rich food product for older adults

By: Dr. Naveen Kumar - Associate Professor, CURIN

This article is based on the research paper titled 'The utilisation of mushroom leftovers, oats, and lactose-free milk powder for the development of geriatric formulation' published by Dr. Naveen Kumar, Associate Professor, CURIN in MDPI journal entitled Foods.

As individuals age, their nutritional needs become increasingly vital to maintaining overall health and well-being. Geriatric nutrition focuses on addressing the specific dietary requirements of older adults, helping to prevent illness, optimize health, and improve quality of life. Older adults often experience physiological changes that affect food intake and nutrient absorption, leading to nutritional deficiencies. These deficiencies can increase the risk of chronic conditions, bone density loss, and digestive issues, making it essential to provide appropriate nutrition tailored to their needs.

The illustration has been borrowed from the published paper

One common issue among older adults is lactose intolerance, as the body's production of lactase, the enzyme responsible for digesting lactose, decreases with age. This highlights the importance of developing lactose-free alternatives for elderly nutrition. Additionally, fibre plays a crucial role in maintaining digestive health, preventing constipation, and supporting a balanced microbiome. Low fibre intake can result in metabolic issues, inflammation, and other health complications. Calcium and vitamin D3 are also essential for preserving bone health and reducing the risk of osteoporosis, which is prevalent among aging populations.

In our study, we developed a nutrient-rich food product specifically designed for older adults by blending lactose-free milk powder, mushroom powder, oat powder, jaggery powder, and an oil-based banana flavour in different ratios. The ingredients were selected to meet the nutritional needs of seniors, with oats being recognized as a "super grain" due to their soluble fibre, polyphenols, and antioxidants like avenanthramides, which offer numerous health benefits. Mushrooms, rich in protein and bioactive compounds, further enhance the product's nutritional profile. We observed that increasing the proportion of mushroom powder in the blend improved the protein content while reducing the calorie load, making the product suitable for maintaining a balanced diet. A combination of 15% mushroom powder and 30% oat powder achieved the best results, with the highest sensory scores and the lowest microbial count. This ratio was found to be optimal for solubility, as confirmed by XRD analysis, which showed a less crystalline structure compared to other blends.

Advanced analyses, including GCMS and FTIR, verified the presence of functional compounds such as ergosterol, which contribute to the product's health benefits. ICP-OES analysis further demonstrated significant concentrations

of essential minerals like calcium, potassium, magnesium, sodium, and zinc, all of which are critical for maintaining overall health in older adults. Importantly, the product met safety standards, with the coliform count being nil and the bacterial count falling well within acceptable limits.

By focusing on the nutritional needs of older adults and utilizing a balanced combination of ingredients, we developed a product that addresses key dietary challenges faced by this population. The product, containing 15% mushroom powder and 30% oat powder, is recommended as a practical and health-promoting option for elderly individuals, offering essential nutrients in a form that supports their overall health and well-being.

Leveraging HR analytics for improved organizational performance

By: Dr. Meenal Arora - Assistant Professor, DRC, CBS CURIN

This article is based on the research paper titled 'Enhancing organizational performance through HR analytics capabilities: mediating influence of innovative capability and moderating role of technological turbulence' published by Dr. Meenal Arora (Assistant Professor, DRC, CBS) and Dr. Amit Mittal (Pro-VC, Research Programs, Chitkara University) in Taylor & Francis journal entitled The International Journal of Human Resource Management.

The paper explores how HR analytics can drive improved organizational performance. Businesses are concentrating on leveraging HR analytics to create better, data-driven decisions as they perceive data as a strategic asset. In an era of big data and rapid technological advancement, the research highlights the need to move beyond data collection and instead focus on obtaining meaningful insights. This study employs the Human Capital Framework and Dynamic Capability View to investigate how HR Analytics, viewed as a strategic capacity, may improve performance through innovation. The Human Capital Framework suggests that for HR to be effective there must be a shift from merely having talent to developing the capability to apply skills and knowledge in meaningful way. This study recognizes that the potential of HR analytics goes untapped until HR professionals improve their analytical capabilities, which restricts the strategic influence on organizational performance. Furthermore, it takes into account how this relationship is affected by technological turbulence, which is defined as the rapid rate of technical advancements.

This study reveals two significant challenges within the HR analytics domain. First, some organizations struggle to transition from basic reporting to implementing advanced analytics that provide actionable insights for strategic decision-making. Another significant barrier is lack of capability and expertise in effectively managing HR analytics.
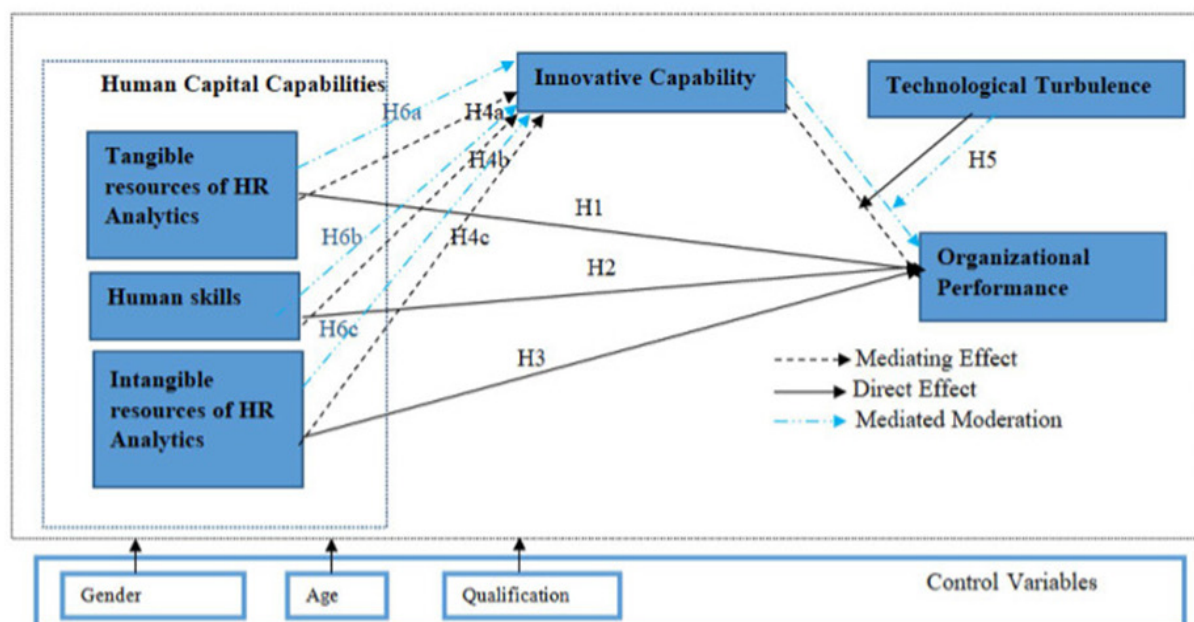
The illustration has been borrowed from the published paper

Many HR professionals lack analytical skills which makes it difficult for them to draw insightful conclusions from data and use those conclusions in decision-making. This competency gap is significant because HR analytics demands excellent knowledge of statistical techniques and data interpretation.

This research further examines how HR analytics capabilities comprising tangible resources, human skills and intangible resources can drive organizational performance. It emphasizes the importance of innovative capability as a mediator, arguing that when organizations develop their analytical competencies, they are better able to foster innovation and thus achieve better outcomes. The research also takes into consideration the moderating influence of technological turbulence, suggesting that the positive effects of HR analytics capabilities are more apparent in situations where technological advancements happen rapidly. The study advances methodologically in HR research by utilizing a hybrid SEM-ANN approach and provides a model that more accurately predicts performance outcomes. This method offers improved prediction accuracy and a more thorough examination of the functioning of HR analytics in various contexts by facilitating a better understanding of both linear and non-linear relationships between variables.

This research implies besides focusing on technology and data infrastructure that HR leaders and business managers, must invest in developing the analytical capabilities of their HR professionals. Organizations may optimize their HR analytics capabilities by prioritizing innovation as a strategic objective. The research indicates that in technologically turbulent environment; analytically driven insights can be amplified by being adaptable and prepared to embrace innovative technology. Managers are encouraged to see HR analytics as more than just a tool for operational efficiency but a strategic capability that drives innovation and competitive advantage.

Machine learning models to study the performance of the proposed novel design of perovskite solar cells

By: Mr. Nikhil Shrivastav – SRF, CRIO

This article is based on the research paper titled 'Exploring KGeCl3 material for perovskite solar cell absorber layer through different machine learning models' published by Mr. Nikhil Shrivastav (SRF, CRIO), Dr. Rahul Pandey and Dr. Jaya Madan – Assistant Professors, CRIO, Chitkara University, Punjab in Elsevier journal entitled Solar Energy.

The work addresses the critical performance and stability challenges in perovskite solar cells (PSCs) by introducing a novel device design incorporating layers of tin dioxide (SnO2), fullerene (C60), potassium germanide chloride (KGeCl3), and Me4PACz. In this design, SnO2 acts as the electron transport layer (ETL), offering high electron mobility and compatibility with solution processing techniques. Figure shows the whole process flow diagram of the work. The authors employed machine learning (ML) algorithms to predict power conversion efficiency (PCE), simplifying
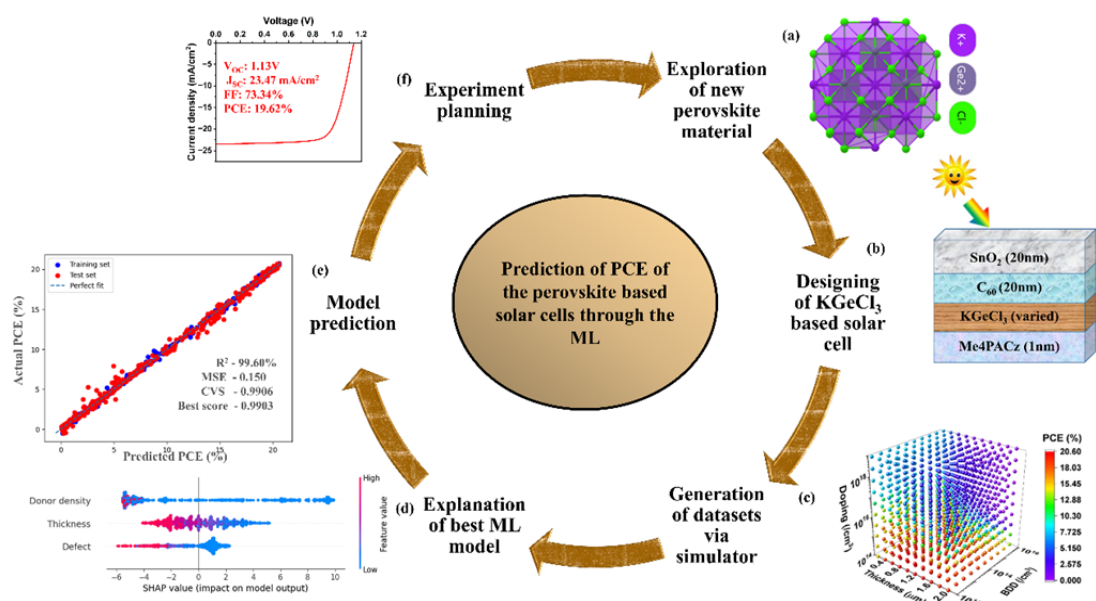
The illustration has been borrowed from the published paper

computations and enhancing prediction accuracy. The study utilized SCAPS 1D simulation and generated a dataset of 1000 samples to systematically explore the complex interactions between device parameters and their impact on efficiency and stability. Optimization of the proposed PSC design yielded impressive photovoltaic parameters: open-circuit voltage (VOC) of 1.13 V, short-circuit current density (JSC) of 23.47 mA/cm², fill factor (FF) of 73.34%, and PCE of 19.62%. Among the ML models tested, ensemble techniques like XGBoost (XGB) outperformed individual models such as Support Vector Regression (SVR) and Random Forest (RF). XGB delivered the highest accuracy, with a mean squared error (MSE) of 0.150 and an R² value of 99.60%, demonstrating its superior ability to handle complex datasets and accurately predict PCE.

The results of the study highlight the effectiveness of using ensemble machine learning models, particularly XGB, for improving PCE predictions in PSCs, and showcase their resilience across performance metrics. This research opens new avenues for developing perovskite-based solar cells without the need for lengthy simulations, marking a significant step toward efficient and stable PSC design.

Study of image segmentation techniques for computer vision applications

By: Dr. Ayush Dogra - Assistant Professor, CURIN

This article is based on the research paper titled 'Image segmentation review: Theoretical background and recent advances' published by Dr. Vinay Kukreja (Professor, Research, CRIO), and Dr. Ayush Dogra (Assistant Professor, Research, CRIO) in Elsevier journal entitled Information Fusion.

This article provides a comprehensive overview of image segmentation, which is a key technique in computer vision that helps in analyzing images by dividing them into meaningful sections and making it easier to interpret its contents, especially in fields such as medicine where accurate image analysis is crucial for diagnosis and treatment. This process is important for a wide range of applications that include object recognition, diagnostic imaging, surveillance systems, etc. In recent years, there have been significant advancements in computer vision techniques, with the availability of large datasets and improvements in deep learning, which is a branch of artificial intelligence that allows computers to learn patterns from vast amounts of data. It has greatly improved the accuracy and efficiency of image segmentation. Specifically, deep convolutional neural networks (CNNs) have become an important method for performing image segmentation tasks as they can automatically learn important features from the data.

This article reviews the various methods and categorizes these methods into different algorithms and compares how well they work in various situations. In addition to medical applications, the review also covers non-medical uses of image segmentation and shows its versatility in various fields. The article also discusses the datasets used in the research and explains how these datasets are essential for training and testing the performance of segmentation models. Researchers use these datasets to experiment with different methods and to refine their models so that they work effectively in real-world scenarios.

Despite the progress made in image segmentation, there are still several challenges. One major issue is that segmentation models focus too much on the background of an image, which can cause them to miss important details in the foreground such as tumors in a medical scan. To address this, researchers have developed techniques like data augmentation, which involves increasing the variety of images used to train the models. This helps the models perform better by learning from a more diverse set of examples. Another method is rebalancing the dataset and making sure that the model pays equal attention to both the background and foreground features.

There are some other issues like extreme class imbalance that also limit the performance of segmentation models. Techniques like Domain Invariant methods are being developed to automate the process of balancing datasets, but these methods are still being refined. Another promising approach is using loss functions that focus the model's attention on specific areas of the image rather than analyzing the entire image at once. Weakly supervised learning and unsupervised learning techniques are also being explored to address the problem of limited labeled data common in medical image analysis. These methods allow models to learn from incomplete or less detailed data, making them more adaptable and flexible. Therefore, while image segmentation has come a long way, there are still many challenges to overcome. The ongoing research is focused on refining these methods and finding new ways to improve accuracy, especially in critical areas like medical imaging.

Forging Collaborations for Research Advancements

New Journal Launch with Springer Nature

Chitkara University has partnered with Springer Nature and launched a Scopus indexed journal titled Journal of Transformative Technologies and Sustainable Development. Published by Springer Nature, this journal is going to be the official publication of Chitkara University, and this is the first of its kind partnership between Springer Nature and any Indian university. It highlights the research prowess of Chitkara University and our commitment to advancing high-quality research that can drive meaningful change in the world.

The launch event, held on September 18, was graced by the leaders from both Chitkara University and Springer Nature. Among the distinguished guests were Dr. Madhu Chitkara - Pro Chancellor, Chitkara University, and Dr. Fiona McKenzie - Vice President of Springer Journals. Ms. Survira Srivastav (Publishing Director, Mathematics, Physical, and Applied Sciences, Springer Nature, India) and Ms. Teena Bedi (Senior Publisher, Springer Nature) also presided over the occasion.

Dr. Fiona McKenzie expressed her enthusiasm for this collaborative initiative with Chitkara University and stated that the journal will provide an important forum advancing knowledge and fostering progress towards a sustainable future. Dr. Madhu Chitkara emphasized the significance of the journal in the broader context of Chitkara University's mission.

The editorial team of the journal will be led by Dr. Rajnish Sharma (Vice Chancellor, Chitkara University, Himachal Pradesh) and Dr. Pao-Ann Hsiung (Professor, National Chung Cheng University, Chiayi, Taiwan) in the role of Editor-in-Chief. Dr. Chun-Hsian Huang (Professor, National Changhua University of Education, Taiwan) is going to serve as the Associate Editor-in-Chief, Dr. Sagar Juneja (Associate Director, Research, CURIN) is the Associate Editor, and Dr. Amit Mittal (Pro Vice Chancellor, Research Programs, Chitkara University, Punjab) is the Section Editor.

The Journal of Transformative Technologies and Sustainable Development is an interdisciplinary open-access journal dedicated to advancing both theoretical and practical knowledge related to engineering, technology, management sciences, and sustainability. The journal focuses on the global implications of technological, managerial, societal, economic, and environmental transformations associated with sustainable development.

MoU Signing with IIITDM Jabalpur

Chitkara University and the Indian Institute of Information Technology, Design and Manufacturing (IIITDM) have signed a Memorandum of Understanding (MoU) on July 1, 2024, to foster academic excellence and strengthen collaborative efforts between the two institutions. This partnership aims to facilitate joint research initiatives, faculty exchanges, and student mobility programs, enhancing both educational and research standards. By combining their expertise, the institutions seek to explore innovative solutions and breakthroughs in various fields of technology and science. The MoU sets the foundation for a dynamic collaboration that promises to positively impact academic achievements and research advancements at both Chitkara University and IIITDM Jabalpur.

Prospective Research Partnership with Universal AI University

Research Collaboration Initiative (RCI) team, CURIN, recently held a fruitful virtual meeting with Universal AI University, Mumbai, on August 12 to explore potential for research collaborations. Led by Dr. Amit Mittal, alongside Dr. Rahul Pandey (Assistant Director, Research, CRIO) and Namita Sharma (Program Manager, RCI), the discussions were aimed at strengthening research initiatives between the two institutions. Representing Universal AI University were Dr. Asha Bhatia (Dean of Research & Doctoral Studies), Dr. Shilpa Joshi (Director of Academics), and Dr. Guru Prasad (Deputy Director of Research). Key topics of discussions included the development of innovative research sandpit models, strategies to enhance research capabilities, and plans for joint conferences and workshops. The productive exchange laid the groundwork for collaborative research activities and explored the possibility of formalizing the partnership through a MoU.

LoI with Exigo Recycling Pvt. Ltd.

Chitkara University and Exigo Recycling Pvt. Ltd. have entered a pivotal partnership, marked by the signing of a Letter of Intent (LoI) on August 13, aimed at advancing research in sustainability and resource recovery. This collaborative initiative, led by Dr. Amit Mittal from Chitkara University and Dr. Parveen Kaushik – Head, R&D, Exigo, to focus on aligning with Sustainable Development Goals (SDGs) to drive impactful environmental solutions. The partnership will explore innovative recycling technologies and resource recovery processes, including developing mechanical and chemical methods to recover materials and metals. By generating KYM (Know Your Material) through advanced analytical techniques and converting these into SRM (Secondary Raw Materials), the collaboration seeks to make significant strides towards creating a more sustainable future.

Initial Meet with Acchutha Institute of Optometry

Chitkara University and Acchutha Institute of Optometry, Tamil Nadu, have embarked on an exciting new partnership aimed at revolutionizing eye care through the power of AI and machine learning via an initial meet held on September 9, 2024. Facilitated by Team RCI, this collaboration will bring together key experts from both institutions to focus on groundbreaking research, innovation, and community impact. With a shared agenda that includes developing AI-driven solutions for community eye care, publishing cutting-edge research, hosting joint events, and exploring funding opportunities, this partnership is poised to deliver transformative outcomes.
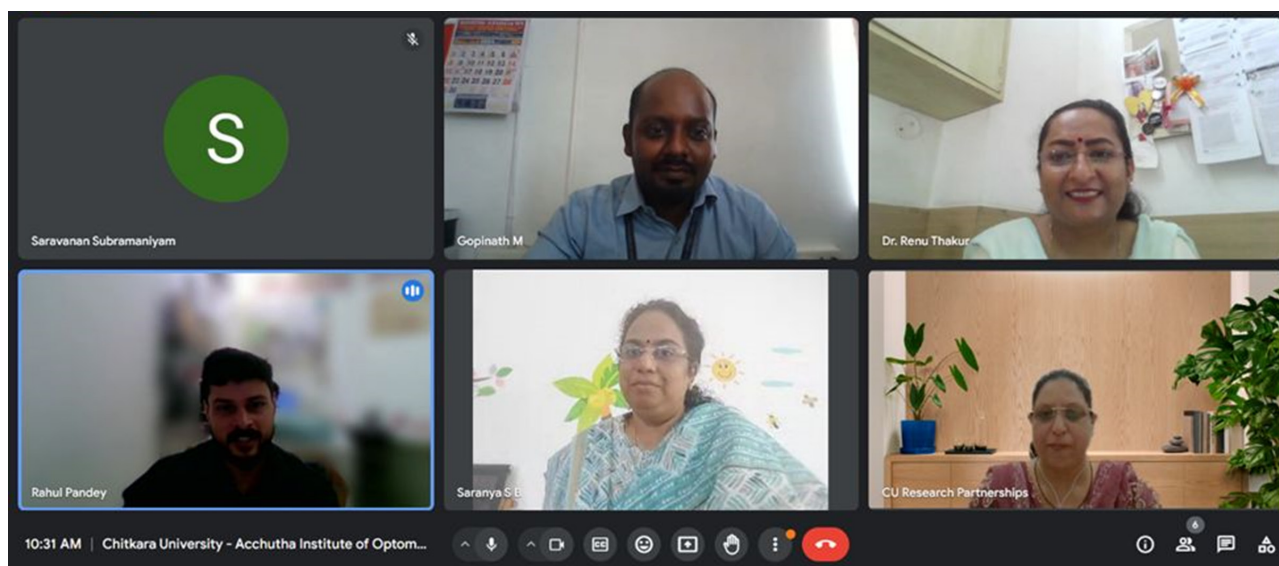
Impactful Applied Research with High Societal Impact at Chitkara University

Chitkara University Research and Innovation Network (Applied Research Group) has a mandate of creating sustainable innovations with high societal impact. It applies technical and scientific knowledge to produce meaningful research in the areas of agriculture, health, education, accessibility, and lifestyle. The group has bagged several research projects from funding agencies such as Department of Science and Technology (DST), Government of India. Additionally, international relations that they have fostered over the years help them in getting international projects such as the Indo-UK projects. Through several industry collaborations, they are developing products that are creating huge impact. Furthermore, they offer consultancy in the areas of electronics fabrication, testing and characterisation, high-end GPU-based computing facilities, machine learning and artificial intelligence projects, embedded system and IoT design, and microwave engineering. Finally, the group is committed to helping students and faculty members of the university in translating their projects and research from TRL1-3 to TRL5-7.

In the quarter 3 of 2024, faculty members for CURIN (Applied Research Group) bagged two funded projects, the details of which are as follows:

1. During the 24th Programme Advisory and Monitoring Committee Meeting of the Technology Interventions for Disabled and Elderly (TIDE) Programme of the Department of Science and Technology, a noteworthy project

presentation was delivered on Dhwani VR, an innovative hearing loss detection device tailored for elderly individuals. The committee recommended the project with a budget of INR 25 Lacs. Dr. Gurjinder Singh (Assistant Professor, CURIN) is the Principal Investigator, while Dr. Nitin Saluja (Senior Director, Research, CURIN) and Shivam Sharma (Senior Game Developer, and PhD Scholar, CURIN) are the Co-PIs of this promising project.

Dhwani-VR aims to revolutionize hearing screening for elderly patients by developing an affordable, easy-to-use device leveraging virtual reality (VR) technology and spatial audio. This innovative device functions as a non-invasive screening tool, utilizing the Doppler Effect principle to create an immersive 360-degree virtual environment. In this project, users will wear a VR headset, experiencing a combination of 3D audio and interactive visuals. The primary objective is to accurately assess the hearing capabilities of elderly patients in a friendly and engaging manner. The device evaluates hearing by projecting specific frequencies and measuring the users' responses, determining the degree of hearing loss.

2. Emerging as one of the leading institutes globally, Chitkara University, Punjab has received a prestigious SPARC research grant in profound association with University of Cambridge, UK under UKIERI phase-4. The project team involves Dr. Sunita Mehta (Assistant Professor, CURIN, Chitkara University) and Dr. Nitin Saluja as PIs from India and Dr. Luigi G. Occhipinti and Dr. Jong Min Kim as PIs from UK.

The project focuses on developing a device with a novel form-factor to assist persons with special abilities. The sanctioned project amount is INR 40 Lacs to Indian Host Institute and GBP 60K to the UK Host Institute. This research grant will provide unique opportunities for the two Institutes to exchange knowledge and skill sets through visits, workshops, and other dissemination platforms. In addition, high-quality publications and novel product development will be the major outcomes of the project.

Individual Contributions of CURIN and CRIO Faculty Members

- Dr. Jaya Madan - Assistant Professor, Research, CRIO, served as a resource person at the workshop organized by PDPM Indian Institute of Information Technology, Design and Manufacturing, Jabalpur (MP), India, during the National Workshop on Recent Advancements in Semiconductor Devices-2024 held from July 1 to 3, 2024. Her presentation focused on FET Technology for Advanced Biosensing, where she highlighted how field-effect transistors (FETs) can function with biological molecules such as enzymes, antibodies, or DNA probes to detect specific biomolecules, including proteins, DNA, and pathogens. This fusion of electronics and biology paves the way for developing highly sensitive, rapid, and portable biosensing devices.

- Dr. Kalpna Guleria - Professor (Research), CURIN was invited as a judge at the Sustainable Development Convergence – 2024 at Gillco International School, Mohali, on July 27. This incredible event brought together students from over 12 schools across Chandigarh, Panchkula, and Mohali, focusing on three crucial Sustainable Development Goals, including SDG 12: Responsible Consumption and Production, SDG 14: Life Below Water, and SDG 15: Life on Land. The primary objective of this event was to raise awareness among young minds about sustainable development —a global concern that impacts our present and future.

- Dr. Jitendra Kumar Katiyar - Assistant Professor, CRIO, was invited as a Guest of Honor in the 6th International Conference on Manufacturing, Material Science and Engineering at Vigyan Institute of Technology & Science, which was held on 16-17 August 2024. He delivered an expert talk on The Impact of Tribology on the Society for Sustainable Development. He also received the Best Researcher Award for 2024 in the field of Materials at the same conference.

Dr. Katiyar was invited as an expert speaker in the 4th Malaysia International Tribology Conference that was held in Sabah, Malaysia on 2-3 September. He delivered a talk on Electroless Nickel Phosphorous/Nickel Boron Nano Composite Duplex Coating to Prevent Corrosion and Wear. Such coatings are crucial for enhancing the lifespan of
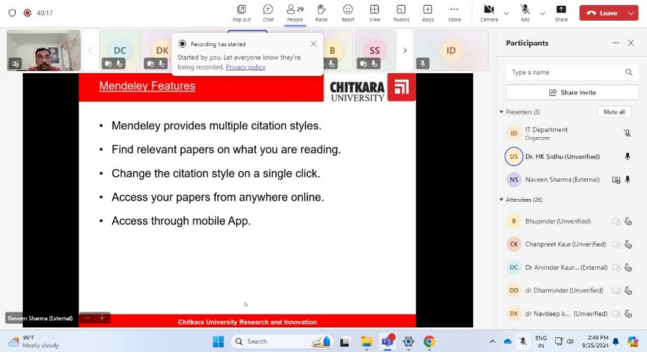
components and machinery. The talk was aligned with the SDG 9. He met the stalwarts of the field in the conference from Malaysia, Japan, Indonesia, and the UK, and explored collaboration opportunities with them.

He is also serving as Guest Editor and Associate Editor of several prestigious publications and journals, including Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology (Sage), Industrial Lubrication and Tribology (Emerald), Journal of the Mechanical Behavior of Materials, Recent Patents on Mechanical Engineering, Bentham Science (Scopus), and Surface Review Letters. He was a session chair in the 4th Biennial International Conference on Future Learning Aspects of Mechanical Engineering (FLAME - 2024), 31 July to 2 August, Amity University, Noida.

- Dr. Naveen Kumar - Associate Professor, CURIN, delivered an expert session as part of the Faculty Development Program on September 25, hosted by Desh Bhagat University, Mandi Gobindgarh, Punjab. His session was titled Maximizing Research Outcomes: Enhanced Academic Writing, Funding Opportunities & Collaborations. He emphasized the importance of precision in academic writing, focusing on how high-quality references, accurate citations, and the inclusion of well-structured images can significantly elevate the credibility and impact of scholarly articles. He provided practical insights into the effective management of references and citations, demonstrating the use of Mendeley, a reference management tool, in a hands-on segment of the session.

- On September 18-19, Confederation of Indian Industry (CII) organized a conference at CII, Ludhiana, on the theme of Achieving Excellence in Manufacturing, where Dr. P.K. Khosla - Pro Vice-Chancellor, Research, CURIN, was invited as one of the panellists. He discussed the critical role our university can play in driving Industry 4.0. He emphasized the importance of educating executives on cutting-edge technologies and the implementation of cyber-physical systems in manufacturing processes. Dr. Khosla also engaged with various government organizations to understand their needs and explored collaboration opportunities, further strengthening the university's contribution to the future of smart manufacturing.

- HDFC Bank Mandi Gobindgarh invited Dr. Renu Thakur – Professor, CRIO, to speak on the important topic of Women Healthcare in the Workplace. The conversation was focussed on improving well-being and support system for women

and creating a healthier work environment for them. Workplaces are evolving and is essential to prioritize the health and well-being of women to ensure we can all thrive, both professionally and personally. This was a message that Dr. Renu delivered through her session that was held on September 26.

Contribution of Our Faculty Members in Academic Conferences

- A paper titled Synergistic Fusion ML Algorithms and Ensemble Technique for Water Quality Classification, authored by Preet Singh, Dr. Taniya Hasija (Assistant Professor), and Dr. Ramkumar K R (Professor), CURIN, won the Best Paper Award at the 2024 IEEE International Conference on Smart Power Control and Renewable Energy that was organized by the National Institute of Technology (NIT), Rourkela during July 19-21. Their research presented a novel approach for water quality classification, leveraging synergistic fusion machine learning (ML) algorithms and ensemble techniques. This paper stood out among a competitive pool of over 300 papers presented at the conference, securing the Best Paper Award for its scientific rigor, innovative methodology, and potential impact on both the academic research as well as practical applications of water quality monitoring and management.

- Dr. Sonam Mittal - Assistant Professor, CURIN, was awarded an appreciation certificate for her outstanding contributions as a reviewer in the Technology & Engineering Management Society Conference: Asia-Pacific 2024 (TEMSCON) that was held in Bali, Indonesia, on September 25-27. She also served as a reviewer in the IEEE Conference on Networks, Multimedia, and Information Technology (NMITCON- 2024) organized by NITTE Meenakshi Institute of Technology, Bengaluru, India, on August 9-10, and in the 2nd International Conference on Data Science and Network Security (ICDSNS-2024) that was held in July 2024 at the Kalpataru Institute of Technology, Tiptur, Karnataka.

- Dr. Vatsala Anand - Assistant Professor, CURIN, served as a member of the Technical Program Committee and Reviewer Committee in several conferences, including the 5th International Conference on Data Science and Applications (ICDSA-2024) that was held during July 17-19 at Malaviya National Institute of Technology, Jaipur, India; 3rd IEEE World Conference on Applied Intelligence and Computing (AIC 2024) held during July 27-28; and 2nd International Conference on Artificial Intelligence: Theory and Applications (AITA 2024) organized by ICFAI Business School (IBS) Bangalore during August 9-10. She also acted as a reviewer in ICDSNS-2024, and International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS) organized by Navkis College of Engineering, Hassan, on August 23-24.

- Dr. Ayush Dogra - Assistant Professor, CRIO, was invited as a Plenary Speaker at the Global Meet on Laser Optics and Photonics that was held in Madrid, Spain, on August 8-10. He has been serving as a Publication Chair for the IEEE International Conference on Intelligent Perception and Computer Vision (CIPCV 2024). Furthermore, he has been associated in different capacities with the several conferences, including Asian Conference on Intelligent Technologies (ACOIT 2024), 5th International Conference on Mobile Radio Communication and 5G Networks 2024, 2nd World Conference on Communication and Computing 2023-24 (WCONF-2024), 3rd IEEE World Conference on Applied Intelligence and Computing (AIC 2024), 5th Congress on Intelligent Systems, ACM International Conference on Robotics, Control and Vision Engineering, and 2nd International Conference on Computer Graphic, Animation & Signal Processing.

  He has been serving as a Member of Editorial Board of several prestigious journals including, Scientific Reports, a Nature Journal, Traitement du Signal IIETA, and BMC Artificial Intelligence. He is acting as an editor of the book titled Hyper-Connectivity and Communication in 6G Technology that is going to be published by IGI Global Publishers. Dr. Dogra has been appointed as a member of The International Management Research and Technology Consortium (IMRTC), USA, dedicated to management research and bridging the gap between academia and industry, and Institute for Educational Research and Publication (IFERP). He is also selected as an International Mentor with I2OR India, and a Bentham Ambassador for the year 2024-25 by Bentham Science Publisher.

- Dr. Kalpna Guleria chaired a session on August 24 in the prestigious 5th International Conference on Mobile Radio Communication & 5G Networks (MRCN 2024) that was sponsored by Springer and held at the University Institute of Engineering and Technology (UIET), Kurukshetra University, Kurukshetra. In this session, participants presented research articles in the areas of AI, Machine Learning, and Computer Vision.

- Dr. Mudita - Assistant Professor, CURIN, served as a session chair in different conferences, including 5th Congress on Intelligent Systems (CIS 2024), which was held on September 4-5, 2024 at CHRIST University, Bangalore; 4th Asian Conference on Innovation in Technology (ASIANCON 2024) held on August 23-24; and AIC 2024. She also acted as a reviewer in the 1st IEEE International Conference on Smart Power Control and Renewable Energy. Dr. Mudita also reviewed journal articles in Scientific Reports, Peer-to-Peer Networking and Applications and the Journal of King Saud University: Computer and Information Sciences.
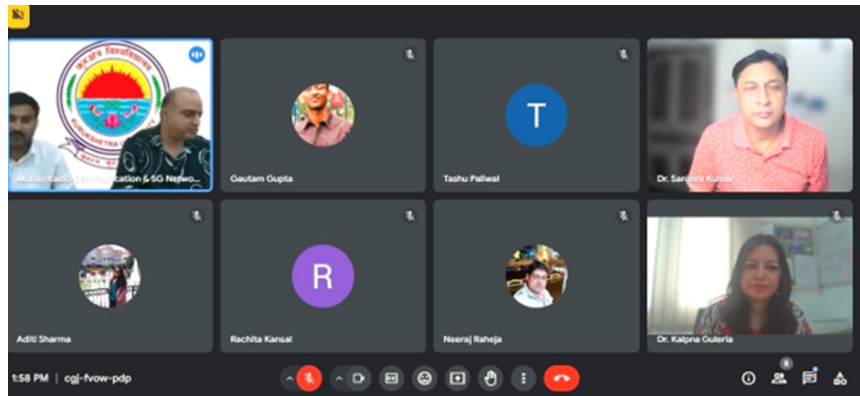
- Dr. Himanshi Babbar - Assistant Professor (Research), CURIN, served as a session chair in the AIC 2024 for the track titled Big Data and Data Analytics. She also served as a session chair for the track titled Computational Intelligence in the 3rd International Conference on Advances in Data Driven Computing and Intelligent Systems (ADCIS 2024) held during September 20-21 and organized by BITS Pilani, Goa Campus, India.
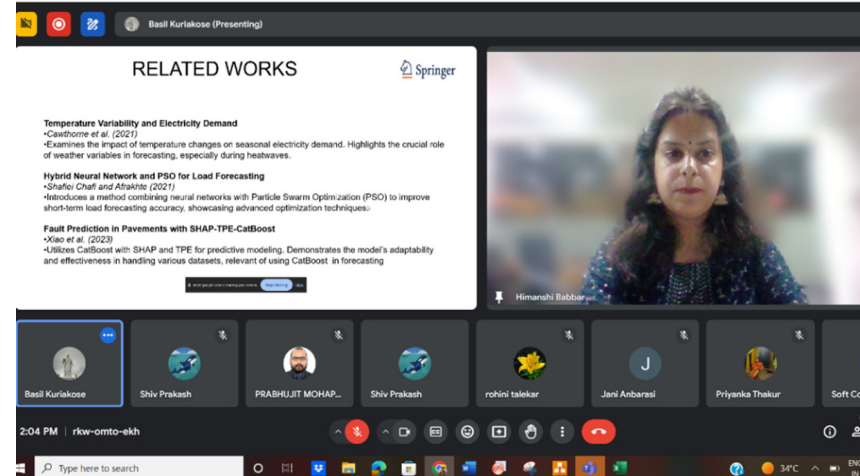
- Dr. Sagar Juneja – Associate Director, Research, CURIN, served as a member of the core committee of the prestigious IEEE Region 10 Conference, TENSYMP 2024, which was organized by the IEEE Delhi section in New Delhi on September 27-29. He managed the paper review process on the CMT portal for TENSYMP 2024 under the guidance of Dr. Rajnish Sharma (Vice Chancellor, Chitkara University, H.P.), who was the Organizing Chair of the conference. Dr. Sagar was invited to attend the inaugural ceremony of TENSYMP 2024 on September 27, wherein Honourable Dr. Madhu Chitkara – Pro-Chancellor, Chitkara University, was the Guest of Honour.

Initiatives to Promote Innovation and Entrepreneurial Spirit in the University

Start-up Investor Connect Program

On September 26, Startup Investor Connect Program was organized by the Chitkara Innovation Incubation Foundation (CIIF) in the university campus. The event was aimed at bridging the gap between start-ups and potential investors by providing a platform for networking and knowledge sharing. A number of prominent investors from various capital networks and venture firms attended the event, each delivering an insightful talk on entrepreneurship, venture capital, and investor expectations.

The event featured key investors from prominent capital networks, including Mr. Bhavish Sood from Modular Capital, who delivered a talk titled Career Paths in Venture Capital and Tech Entrepreneurship, offering a glimpse into the evolving world of technology and venture capital. Mr. Manish Johari from Maple Capital Advisors shared his expertise on What an Investor Looks into a Startup, highlighting the critical factors that attract investors to early-stage ventures. Ms. Nitika Mishra Khurana from Chandigarh Angels Network took the audience through the process of transforming ideas into viable businesses through her session that was titled Idea to Execution. Mr. Sahil Makkar from Punjab Angels Network delved into the topic of Understanding Investor Psychology, shedding light on how investors assess potential startups, while Mr. Baldev Garg from Chandigarh Angels Network inspired attendees with his talk on How to Become a Successful Entrepreneur, sharing his personal experiences and the traits necessary for success. Mr. Krishna Dev Pathak from Boon Capital demystified the venture capital process, explaining various stages of funding and how startups can prepare for each phase.

These insightful talks were followed by Pitching Sessions by startups who presented their ideas directly to the investors, showcasing their potential for funding and growth. This was accompanied by a round table discussion, facilitating one-on-one meetings between entrepreneurs and investors, providing personalized feedback and potential collaboration opportunities. In the valedictory session, Dr. Adarsh Aggarwal – CEO, CIIF, Chitkara University, felicitated speakers and expressed his gratitude to them as well as the audience and start-ups for participating in the event.

Online Capacity Building Workshop for the Incubators

On September 10, 2024, CIIF hosted an online Capacity Building Workshop for the incubators. The event attracted around 40 participants from various incubators across Punjab, including incubator managers, innovation leaders, and ecosystem builders. The speaker of the workshop was Dr. Alok Nikhil Jha, who is currently serving as Head of Development, Innovation & Resources (TechTransfer, Startup, Fundraising, CSR) at Indraprastha Institute of Information Technology, Delhi (IIIT-D). As a prominent expert in technology transfer, innovation, and fundraising, Dr. Jha shared valuable knowledge and strategies to strengthen incubation ecosystems. He emphasized the pivotal role of incubators in facilitating technology transfer from research institutions to startups, stressing the importance of partnerships between incubators and universities to access cutting-edge research and foster innovations.

In additon, Dr. Jha also discussed the comprehensive support system that incubators can provide to startups, including mentorship, business development, and networking opportunities, along with access to resources. He highlighted the need for incubators to nurture startups through a well-rounded approach that promotes both business and technology development. Furthermore, he provided insights into various fundraising strategies available to incubators, with a particular focus on leveraging Corporate Social Responsibility (CSR) funding. The interactive nature of the workshop allowed participants to share their experiences and challenges in running incubation programs. Issues such as the need for better infrastructure, access to skilled mentors, and the importance of building sustainable business models for incubators were discussed. Dr. Jha encouraged collaboration and resource-sharing among incubators to overcome these hurdles.
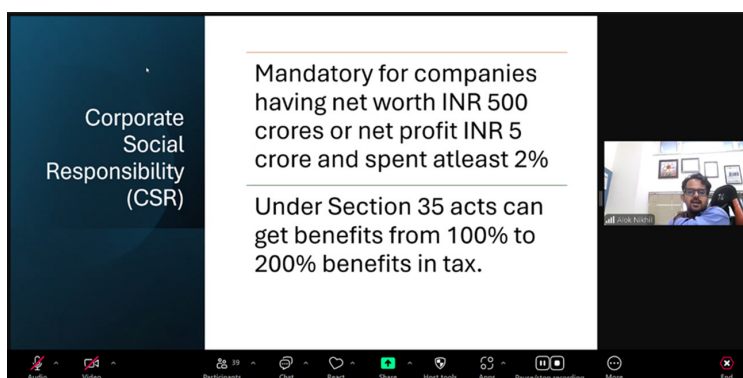
Talk Series on Innovative Ideas to Successful Products

Department of Science and Technology (DST) funded Chitkara University NewGen IEDC and Chitkara University, Technology Enabling Centre (CU-TEC) conducted two expert talks under the Talk Series titled Innovative Ideas to Successful Products in the month of July and August 2024.

The first talk under this initiative was held on July 18 and it was delivered by Mr. Aniket Bharadwaj – CEO, Seacup Visionaries Pvt. Ltd. Mr. Aniket, who is running a successful venture of developing state-of-the-art electric bikes for riding and cargo use, shared his journey from ideation

to building a successful product with an audience comprised of over 82 students from the Electronics and Communication Engineering (ECE) department of Chitkara University. He discussed the common pitfalls, challenges associated with building technology-oriented hardware products and how to evolve the products by understanding the limitations as well as the market needs. He further emphasized the importance of securing the seed funding for building the prototypes. His session was extremely well received by the students, who are keen to submit their innovative project ideas in NOVATE+ 2024 hackathon to secure seed funding for building their prototypes.

On **August 14** we had the privilege of listening to Prof. (Dr.) Praveen Kumar Khosla – Pro-VC (Research), Chitkara University, Punjab. In his thought-provoking and insightful talk, he highlighted how the innovation index of the country directly impacts its economic prosperity. Further, he gave deep insights with examples on how technology plays a significant role in driving growth for the companies. He inspired students to adopt certain behavioural traits for becoming good innovators. Further, he shared many real-world problem statements that demand disruptive technological solutions. Finally, he shared some of his own innovations that he has carried out in his research career spanning over 4 decades, and highlighted how these innovations are creating a huge impact in society. By doing so, he motivated students to take-up problem statements that can have far and wide societal impact.

His talk was attended by over 100 students from different Engineering streams and Health Sciences department. Close to 15 faculty members from different departments as well as some start-ups also attended this session. The main goal of this talk series is to inspire students and faculty members to take-up projects in such a manner that they can be converted into products and reach the right recipients/beneficiaries. These sessions were convened by Dr. Sagar Juneja – Associate Director, Research, CURIN, and Coordinator, Chitkara University NewGen IEDC and CU-TEC.

Workshop on Cutting Edge: Innovations in Laser Cutting Technologies

On July 29 and 30, the Department of Communication Design, Chitkara Design School in collaboration with the Chitkara University NewGen IEDC, organised a hands-on workshop titled Cutting Edge: Innovations in Laser Cutting Technologies Workshop. Delivered by Mr. Chanpreet Singh - Project Manager, CURIN, Chitkara University, Punjab, this workshop provided

a platform for the students to learn about and experiment with the advanced laser cutting machine. Students learned the fundamental principles and applications of laser cutting. They understood the entire workflow, from conceptualizing and preparing 2D designs using design software to setting up and executing precise cuts on materials using laser cutting machine. Finally, they learned the creative and technical aspects of this powerful technology. The workshop was attended by 40 students and 3 faculty members.

DST's Cross Talk Series

Chitkara University Technology Enabling Centre (CU-TEC) is one of the 22 TECs that have been

set-up by the Department of Science and Technology (DST) in the country that aims at promoting industry-academia collaboration in their respective regions for the joint development of technologies. DST started a unique Cross Talk Series to connect all TECs and promote knowledge and information sharing among them. On August 3, in one such event, Dr. Sagar Juneja made a presentation about some of the key academic technologies mined and industry problem statements identified by CU-TEC. He also gave insights about some of the important activities being undertaken by CU-TEC.

Intra-University Project Exhibition by DICE

8 student projects supported by Chitkara University NewGen IEDC and 2 projects from the Immersive and Interactive Technologies Lab (IITL), CURIN, got an opportunity to participate and showcase their project prototypes in the event titled Intra-University Project Exhibition that was held on September 13. It was organized by the Department of Interdisciplinary Courses in Engineering (DICE), Chitkara University, Punjab. The event was inaugurated by Ms. Jatinder Kaur - Ex-Director, Department of Science and Technology, Punjab, alongside Dr. Rajneesh Talwar - Professor and Dean, DICE. This competition-cum-exhibition event showcased the most innovative projects from various departments of the university, including ECE, CSE, Applied Engineering, CURIN, DICE, and NewGen IEDC. Projects were classified into hardware and software categories, highlighting the interdisciplinary strength and versatility of the students. Both categories exhibited interesting project implementations ranging from artificial intelligence applications, robotics, and IoT

systems to renewable energy and automation. The projects were meticulously evaluated by a panel comprising of Ms. Jatinder Kaur, Mr. Jagjit Singh - MD and CEO, JW Infotech Pvt. Ltd., and Mr. Rohit Khosla – Director, Core Systems, Chandigarh. Below is the list of these 10 projects, 2 from IITL, CURIN, and 8 from NewGen IEDC.

1. ARScination
2. Aromatic

   By Priyanka Datta, Neha Garg, and Amitesh Aggarwal (PhD Scholars, IITL) and Dr. Amanpreet Kaur (Assistant Professor, Research, IITL)
3. Autoclavable Multipurpose Steel Chamber (Ravi Goyal, Dr. Deepinder Singh)
4. Automatic and Moveable Vertical Garden Barricades (Lakha Singh, Dr. Pooja Mahajan)
5. Learn-O-Little (Shivam Sharma, Anvesha)
6. Schottky Junction Printable Solar Cell (Nikhil Shrivastav)
7. Fabrication and Testing of Hypoxia Flask for In Vitro use (Monika Sharma, Sushmita Jain)
8. Rodent Surgical Table (Maneesh Mohan)
9. Portable Heat Treatment and Muffle Furnace (Anjandeep Singh Paik)
10. Multipurpose Herbal Oil Processing Machine (Soumarshi Das, Dr. Deepinder Singh)

Over 500 Delegates Participated in 2 Engineering Conferences of Chitkara University

ICEMSMCI 2024 [July 18-19, 2024] and ICAN 2024 [September 24-25, 2024]

2nd International Conference on Emerging Materials, Smart Manufacturing, and Computational Intelligence (ICEMSMCI-2024)

The Chitkara University Publication division under Center for Research Impact and Outcome (CRIO), Chitkara University, Punjab, India, successfully hosted the 2nd International Conference on Emerging Materials, Smart Manufacturing, & Computational Intelligence (ICEMSMCI-2024) on July 18-19, 2024.

The first day commenced with inauguration at Pierre Hall, featuring a virtual campus tour and formal addresses. The ceremony began with the lighting of a lamp and Saraswati Vandana, followed by a welcome address by Dr. Amit Mittal (Pro Vice-Chancellor, Research Programs, Chitkara University, Punjab). Our esteemed Chief Guest, Dr. Apurbba Kumar Sharma from IIT Roorkee, delivered a keynote on Design Innovations, followed by insightful expert talks by Dr. Sanjeev Kumar (CSIR-CSIO), Dr. Navneet Khanna (IITRAM), and Mr. Mukesh Singh (LPS Bossard Pvt. Ltd.). These discussions encompassed a range of topics from bio-signals to sustainability in aerospace materials. In the afternoon, technical sessions featured three parallel tracks focused on sustainable emerging materials, smart manufacturing, and sensing and computing technologies, showcasing presentations on innovative subjects such as bio-waste preprocessing and advanced algorithms for cancer diagnosis.

The second day transitioned to an online format. Keynote addresses included valuable insights from Ms. Priya Vyas (Springer Nature), Dr. Milos Djukic (University of Belgrade), and Dr. Giuseppe Carbone (University of Calabria), discussing critical topics such as scientific writing, hydrogen embrittlement, and innovative robotic technologies, respectively. Technical sessions continued online across five tracks, including manufacturing, robotics, and computational intelligence. The conference concluded in a valedictory session with the announcement of awards, highlights of the key outcomes, and vote of thanks by Dr. Ankit Sharma – Associate Director, Research, CRIO who is the General Chair and Convener of ICEMSMCI. Dr. Ayush Dogra and Dr. Rahul Pandey – Assistant Directors, CRIO are the Co-General Chairs & Co-Conveners of the conference.

The conference received over 200 submissions of which only 65 papers were accepted after a rigorous review process. These accepted papers are going to be published in American Institute of Physics Conference Proceedings, Lecture Notes in Mechanical Engineering, Springer and CRC Press, Taylor and Francis. ICEMSMCI 2024 received support and sponsorship

from Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Govt. of India and industry partners including LPS Bossard, UPS Lakshmi, Foreexcel Pvt Ltd. and Ambey International Pvt Ltd.

4th International Conference on Computing, Analytics, and Networks (ICAN 2024)

The 4th edition of the flagship engineering conference titled International Conference on Computing, Analytics, and Networks – ICAN 2024, was jointly organized by Chitkara University, Punjab and Himachal Pradesh at Chitkara University, Rajpura, Punjab on September 24-25, 2024. Close to 300 delegates from different parts of the world attended the conference in the hybrid mode that featured presentations of 93 research papers in 15 sessions. The accepted and presented papers will be published by Springer Nature in two special issues of the SN Computer Science Journal, which is Scopus indexed.

This year, in ICAN 2024, a total of 619 research papers from 13 countries, including USA, France, Germany, Taiwan, Indonesia, Malaysia, Saudi Arabia, Nigeria, Morocco, Hongkong, Korea, Bangladesh and of course India, were received in the theme areas including Data Engineering; Cyberphysical, Embedded, & IoT systems; Computer & Information Technology; and Security & Privacy. Within India the conference witnessed phenomenal reach with papers coming in from all parts of the country ranging from Jammu Kashmir to Tamil Nadu and Gujarat to Assam, with many top institutions of the country submitting their quality work.

One of the key highlights of the conference was a panel discussion session entitled Impact of GenAI on Education, Research, and Industry - A 360O Perspective, which was held in the inaugural ceremony. The esteemed panellists were Dr. Sandhir Sharma (Vice Chancellor, Chitkara University, Punjab),

Prof. (Dr.) Meenakshi D'Souza (Professor, and Head, CSE, IIIT Bangalore), Mr. Raghav Gupta (Managing Director, India & Asia Pacific, Coursera), Mr. Rasesh Shah (Chief Practice Officer, Fractal Analytics), and Mr. Samit Sawal (Product Technical Architect, Infosys Center for Emerging Technology Solutions, Infosys Chandigarh).

Inaugural ceremony also featured a keynote talk entitled Testing of large-scale IoT Applications by Prof. (Dr.) Meenakshi D'Souza. In addition, the conference featured two invited talks on each day by Prof. (Dr.) Kamal Z. Zamli (Universiti Malaysia Pahang, Malaysia), Dr. Abhijat Vichare (Operations Manager, ACM India), Dr. Sunil Gupta (Professor, UPES Dehradun), and Dr. Bonny Banerjee (Associate Professor, The University of Memphis, USA).

The core organizing team of the conference included Dr. Rajnish Sharma (Vice Chancellor, Chitkara University, H.P.) who has been the General Chair of the conference, Dr. Sagar Juneja (Associate Director, Research, Chitkara University, Punjab) local organizing and publication chair, Dr. Monit Kapoor (Professor and Dean Academics, CUIET, Chitkara University, Punjab) and Dr. Meenu Khurana (Pro VC, School of Engineering and Technology, Chitkara University, H.P.) technical program chairs, and Dr. Rishu Chhabra (Professor and Dean, CSE-Beta Cluster, CUIET) and Dr. Darpan Anand (Professor and Associate Dean, CSE-Zeta Cluster, CUIET) reviewer committee chairs.

In addition to Springer Nature as the publication partner, the conference was also ably supported by Coursera as Knowledge Partner, Chandigarh ACM Professional Chapter, Chitkara ACM Chapter, and Coding Ninjas are partner technical societies.

Events Organized by CURIN and CRIO

Workshops, Seminars, Faculty Development Programs, Expert Talks, Hackathons, etc.

Internal Smart India Hackathon 2024 (SIH 2024)

The Internal Smart India Hackathon 2024 (SIH 2024) organized by the Institution's Innovation Council (IIC), CURIN, Chitkara University during September 11-13, was a monumental event empowering students to solve real-world challenges with creativity and innovation. More than 200 teams competed across the Hardware and Software categories and addressed problems posed by government and industry stakeholders. Organized every year, this groundbreaking initiative by the Ministry of Education's Innovation Cell aims to foster problem-solving skills among students, guiding them to develop cutting-edge solutions aligned with sustainability and entrepreneurial goals. Under the visionary leadership of Dr. Sandhir Sharma - Vice Chancellor, Chitkara University Punjab, and President, IIC, Chitkara University, Punjab, the event saw immense dedication from the participating teams. Over the course of three days, internal jury comprising of Dr. Kalpna Guleria, Dr. Naveen Kumar, Dr. Aashish Kumar, Dr. KR Ramkumar, Dr. Ashu Taneja, and Varinder Singh, evaluated these 200 projects. Based on their recommendations, 60 teams have been shortlisted who will now compete in the next round. The event was spearheaded by Dr. Manish Sharma (Professor, CURIN and Vice President, IIC), Dr. Rakesh Goyal (Professor, CURIN and Convener, IIC), and Dr. Bhanu Sharma (Assistant Professor, CURIN, and University SPOC for SIH 2024). They were ably supported by a core team comprising, Dr. Garima Chopra, Dr. Sushma, Parminder Kaur, Lovish Matta, Sheena Angra, Kishan and Deepak Gupta.
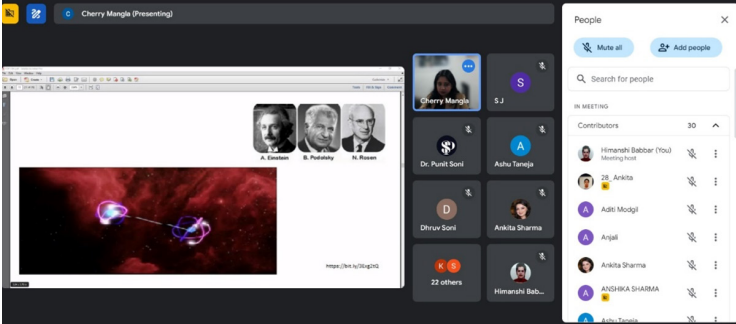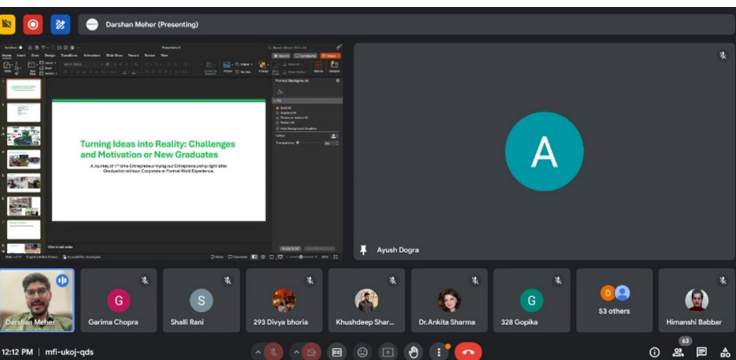
Invited Talks, Expert Talks, Tutorials, and Webinars Organized by CRIO

Under the expert guidance of Dr. Amit Mittal (Pro-Vice Chancellor, Research Programs, Chitkara University, Punjab), and with the able execution of Dr. Shalli Rani (Professor and Director, Research), Dr. Ayush Dogra (Assistant Director, Research), Dr. Himanshi Babbar, Dr. Ankita Sharma, and Dr. Garima Chopra (Assistant Professors), Centre for Research Impact and Outcome (CRIO) organized several seminars, invited talks, and tutorials. The details of which are given below.

- CRIO in collaboration with the DRC, Centre of Health Sciences (CHS), successfully organized an invited

talk on Critical Thinking on Stress Eating on July 12. The resource person, Dr. Yashna Bawa, a renowned dietitian and counsellor, delivered an engaging and informative talk on health issues related to stress eating among both youngsters and adults. Throughout the event, attendees delved into the complexities of stress eating, exploring its causes, impacts, and effective management strategies. Dr. Bawa provided valuable insights and practical advice, which sparked meaningful discussions among the participants. The event saw active participation from over 40 students and 20 faculty members from CRIO and CHS. From CHS, the initiative was led by Dr. Pooja Dogra (Assistant Dean).

- An invited talk titled Quantum Computing - A New Realistic Paradigm was organized by CRIO on July 19, which was delivered by Dr. Cherry Mangla - Assistant Professor, Concordia University of Edmonton, Canada. Dr. Mangla has been at the forefront of quantum computing innovation, significantly contributing to the development and application of quantum computing solutions. Her insights provided an in-depth understanding of how quantum computing can be harnessed for future technological advancements. The event witnessed active participation from over 20 students and 17 faculty members across interdisciplinary departments.

- On July 23, CRIO organized an invited talk titled Ethereum for Innovators: Creating the Future with Blockchain Technology that was delivered by Dr. Shivani Wadhwa - Assistant Professor, CSE, Chitkara University. The event witnessed active participation from over 20 students and faculty members from different departments.

- On July 30, a session titled The Future is Vocal: AI Innovations in Healthcare Speech Technologies was conducted by CRIO, which was delivered by Puneet Bawa – PhD Scholar, CURIN, along with his team member, Harsh Vardhan (Intern). The session was attended by the students and faculty members of the university.

- A webinar on Recent Trends, Challenges, and Opportunities in AI & ML for Wireless Communications was organized by CRIO on August 28 that was delivered by Dr. Abhinav Kumar – Professor, IIT Hyderabad. The discussions in the webinar were focussed on the latest advancements and future directions of Artificial Intelligence and Machine Learning as they apply to the rapidly evolving field of wireless communications.

- On September 2, CRIO invited Darshan Meher - CEO and Co-Founder, Adiabatic Technologies Pvt. Ltd., who delivered an invited talk on Turning Ideas into Reality: Challenges and Motivation for New

Graduates. He shared valuable insights into the journey of transforming ideas into actionable projects. The session was attended by close to 100 participants, including students, faculty members and research scholars.

- Er. Ashu Aggarwal - Cyber Security Analyst, HCLTech, delivered a tutorial on September 12, which was titled Cyber Security Awareness. The session was aimed at addressing the common challenges of cyber security and providing awareness to secure the devices from cyber threats. It was attended by students, research scholars and faculty members of the university.

- CRIO, Department of Computer Science and Engineering and the Centre of Excellence: Cyber Security Technologies jointly organized an expert talk on Enhancing AI Education and Industry Experience on September 23 featuring Yogesh Mehla – CEO and Founder, Techsapphire as the invited speaker. He discussed how AI can revolutionize both education and industry sectors. He shared valuable insights on understanding the intersection of AI and education, preparing students for future industry challenges in AI, and exploring career paths and skill development in AI. Dr. Rupali Gill - Dean CSE- Gamma Cluster, and Dr. Shivani Wadhwa - Assistant Professor, CSE, led the initiative from the CSE department.

Pre-Conference Event

A webinar titled Sustainable Manufacturing: Leveraging Additive Technologies and Materials to Meet the SDGs was conducted by CRIO on September 30. Conducted as a pre-conference webinar to the 1st International Conference on Advanced Materials for Sustainable Future (ICAMSF-2025), it was delivered by Dr. Binnur Sagbas - Associate Professor & Vice Dean, Faculty of Mechanical Engineering, Yildiz Technical University, Istanbul, Turkey. Key topics included the fundamentals of additive manufacturing (AM), sustainable materials, and their connection to Sustainable Development Goals (SDGs). The event brought the highlights on the achievements in AM towards achieving success in various SDGs, including SDG 3, 7, 9, 12, and 13. It was attended by more than 90 participants from different countries, including, India, Indonesia, USA, Uzbekistan, Malaysia, Pakistan, etc. The session was convened by Dr. Jitendra Kumar Katiyar, Dr. Seema Singh, and Dr. Ankit Sharma from CRIO.

85 scholars received their doctoral degrees in the PhD Convocation 2024

PhD Convocation is a momentous occasion that marks the culmination of years of dedicated research, academic rigor, and perseverance for doctoral scholars. It symbolizes not only their academic success but also the formal conferral of the highest academic degree. The PhD Convocation 2024, held on September 21, celebrated the accomplishments of 85 scholars from various disciplines. Among them, 23 scholars were conferred degrees in Computer Science and Engineering, 7 in Applied Sciences, 4 in Education, 2 in Electronics and Communication Engineering, 1 in Mass Communication, and 11 in Pharmaceutical Sciences. Additionally, 26 scholars received degrees in Business Management, 9 in Health Sciences, and 2 in Architecture. This convocation stands as a testament to the university's commitment to fostering academic excellence and research innovation. It reflects the institution's role in shaping the future leaders and contributors to various fields of knowledge.

Activities of DRC, CBS in Q3 2024

Workshops, Faculty Development Programs (FDPs), Seminars, Conferences, etc.

Two-day Workshop on Ethical Research and Publication Practices: Empowering Integrity in Academic Pursuits

To instil a foundation of ethical practices among the students engaged in research and academic writing, Doctoral Research Centre (DRC), Chitkara Business School (CBS) organized a two-day online workshop on Ethical Research and Publication Practices: Empowering Integrity in Academic Pursuits. Attended by 62 research scholars and faculty members, the workshop was scheduled on July 17-18, 2024 and delivered by Dr. Mohit Taneja (Assistant Professor, DRC, CBS). Participants explored the fundamental principles of ethical research, including integrity, transparency, and accountability. The workshop highlighted the consequences of plagiarism and provided strategies for avoiding it, emphasizing proper citation and referencing techniques. The event encouraged active participation through discussions, case studies, and group activities.
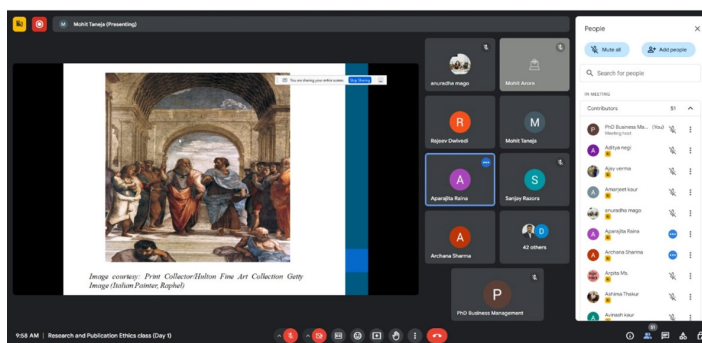
Two-day Workshop on Ethics in Research: Navigating Intellectual Freedom and Integrity in Academia

To make the scholars aware about ethics and misconduct in research, a two-day online workshop was organized during 19-20 July. The resource person was Dr. Niti Chatterji (Associate Professor, DRC). Participants comprising of both students and faculty members were introduced to essential best practices and standards set by organizations like COPE (Committee on Publication Ethics) and WAME (World Association of Medical Editors). Apart from this, resource person also emphasized the importance of selecting reputable journals and conferences, identifying predatory publishers, and adhering to ethical publishing practices. By providing a thorough overview of these practices, the program aimed to foster a commitment to producing original high-quality research.
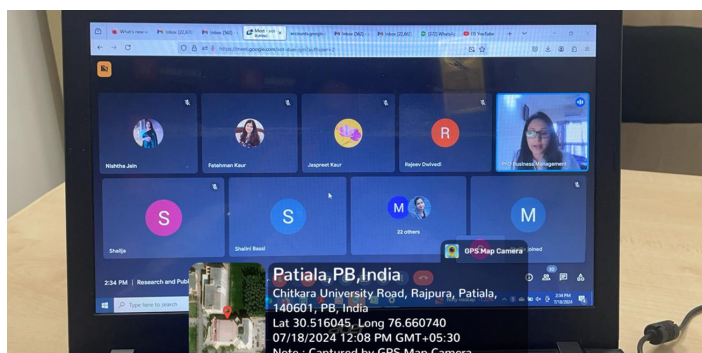
Seven-day FDP on Innovative Approaches to Research Methodology - Enhancing Academic Excellence

A seven-day FDP titled Innovative Approaches to Research Methodology - Enhancing Academic Excellence was organized from August 5 to 11. The resource persons for this FDP were Dr. Balraj Verma, Dr. Sridhar Manohar, Dr. Meenal Arora, and Dr. Seema from the DRC, CBS. This FDP was attended by 55 research scholars and faculty members who gained valuable insights into integrating quantitative and qualitative approaches, along with understanding various research designs and sampling techniques. They learned to effectively counter the limitations of each method. The program provided a solid foundation in research methodology, emphasizing theoretical concepts while also delving into practical applications. Special emphasis

was laid on conducting systematic literature reviews, data collection methods, questionnaire design, and report writing. This FDP significantly enhanced the participants' abilities to conduct collaborative research, equipping both faculty and scholars with the skills necessary for high-quality academic inquiry.

Seminar on Accessing Research Material from EBSCO and IEEE

A seminar titled Accessing Research Material from EBSCO and IEEE was organized on August 8 to empower researchers, students, and academics with the skills to navigate databases for literature search. The resource person was a representative from EBSCO, Mr. Ritesh Kumar, who provided inputs on effective search techniques, strategies for locating relevant academic articles, and best practices for evaluating the credibility of research materials.

Five-day Workshop Maintaining Ethical Standards in Research: The Role of Intellectual Freedom and Academic

A five-day workshop was organized from August 28 to September 1, to deepen the understanding of research ethics and misconduct among scholars and faculty members. This workshop was conducted by Dr. Niti Chatterji and attended by 30 research scholars. Participants were introduced to essential best practices and standards set by organizations.

Seven-day FDP on Exploring the Frontiers of Research: A Deep Dive into Advanced Research Methodology Tools

A seven-day FDP on Exploring the Frontiers of Research: A Deep Dive into Advanced Research Methodology Tools was organized from 2 to 8 September. This engaging workshop was attended by 55 research scholars and faculty members from diverse schools of the university, fostering a collaborative learning environment. Resource persons of this FDP were Dr. Urvashi Tandon (Associate Professor, DRC) and Dr. Arun Aggarwal (Assistant Professor, DRC). Participants were engaged in hands-on activities focusing on key methodologies such as T-Test, ANOVA, Confirmatory Factor Analysis (CFA), Exploratory Factor Analysis (EFA), correlation and regression analysis, and Structural Equation Modeling (SEM). Through hands-on activities and interactive sessions, attendees gained practical skills in analyzing complex data and applying rigorous methodologies to enhance their research capabilities. This program not only bolstered participants' methodological expertise but also promoted a culture of academic excellence and innovation within the university.

Conferences Organized by the Doctoral Research Centre in collaboration with other Universities

• DRC, CBS in collaboration with Maharaja Agrasen Business School (MABS), New Delhi, organized an International Conference on Managing Customer Experience: Role of AI and Analytics on August 7-8. During the conference, Dr. Amit Mittal (Pro-Vice Chancellor, Research Programs, Chitkara University) highlighted about the transformative impact of artificial intelligence and analytics within research and academics. Dr. Sridhar Manohar (Assistant Professor, DRC) served as the Co-Convener.
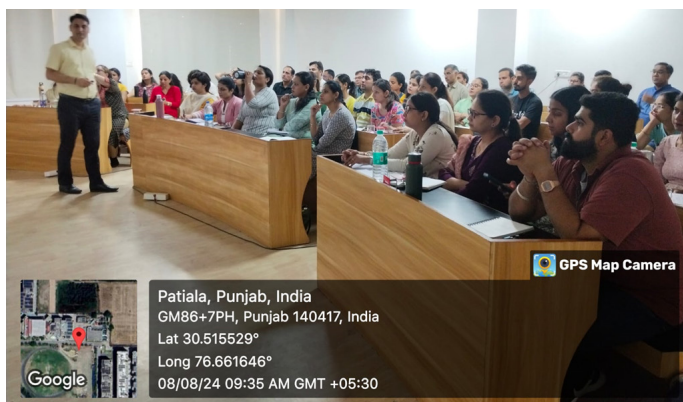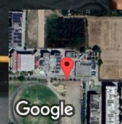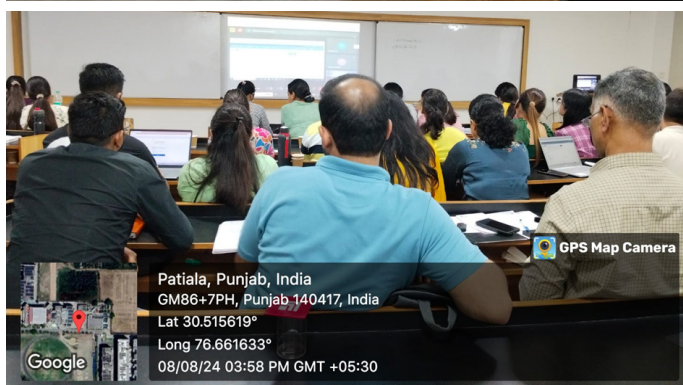
- Chitkara University was a collaborator in the International Conference on Global Perspectives in Management (ICGPM) 2024, which was organized by Indira School of Business Studies PGDM, Pune, on August 23-24. Dr. Amit Mittal addressed the participants, emphasizing the critical role of diverse viewpoints in shaping effective management practises. The event facilitated insightful discussions and provided valuable networking opportunities, leading to innovative ideas and knowledge exchange in the management field. Furthermore, Dr. Arun Aggarwal, Dr. Balraj Verma, Dr. Niti Chatterji, and Dr. Mohit Taneja from DRC, CBS chaired technical sessions in this conference.

Individual Contributions of Faculty Members of DRC, CBS

- Dr. Arun Aggarwal delivered a session at Jaipuria School of Business, Ghaziabad, on 13 July that was centered on the theme Do's and Don'ts for Research Publication: Editor's Perspective.

- Dr. Amit Mittal and Dr. Mohit Taneja delivered a series of research sessions in collaboration with Baden-Wuerttemberg Cooperative State University (DHBW), Germany. These sessions provided a dynamic platform for knowledge exchange and collaboration, bringing together participants from DHBW. The discussions were not only insightful but also sparked innovative thinking across various research domains. The collaborative spirit displayed during these sessions underscores the significance of international partnerships in advancing both academic and practical knowledge. Over the course of two months, the diverse group of participants fostered an engaging environment that encouraged lively discussions reinforcing the vital role of international collaboration in enhancing knowledge.
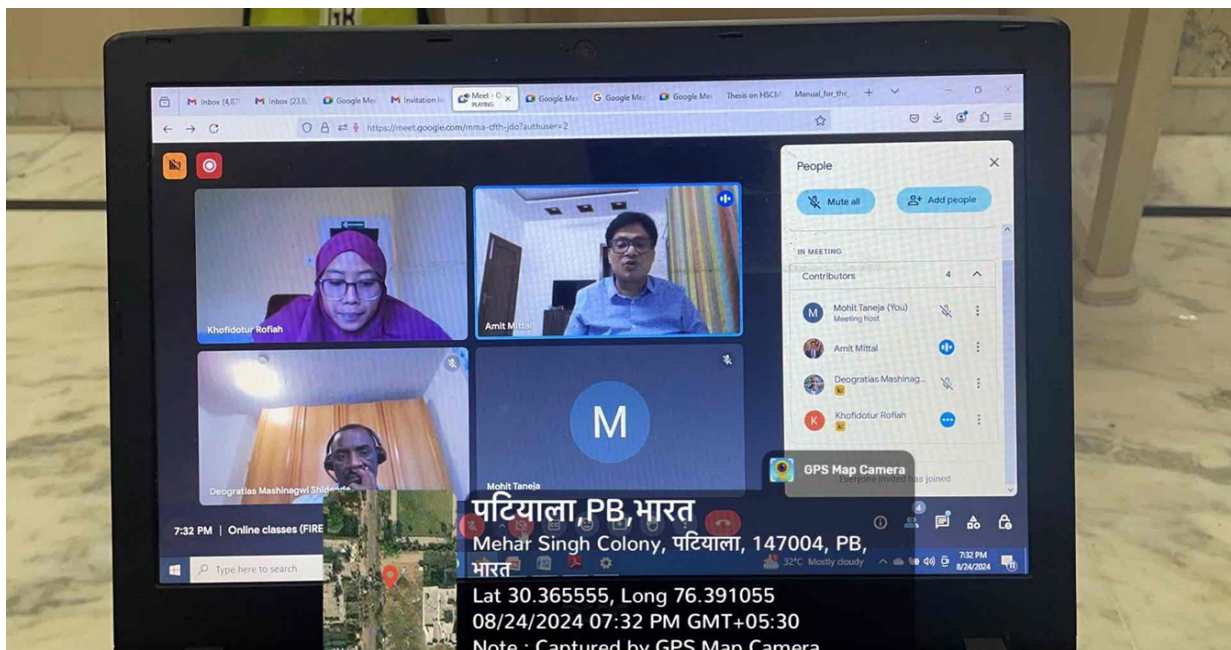
22 Patents Filed by CURIN and CRIO Faculty Members and Scholars in Q3

The Patent Office has Granted
42 Patents
to Chitkara University in Q3, 2024.

A total of 55 patents (including industrial designs) have been filed by different departments of Chitkara University during July - September 2024, out of which 22 have been filed by CURIN and CRIO faculty members and researchers. The details of these 22 patents are given below.

S. No.	Title	Inventors	Application Number
1	Advanced AI-Algorithm-based Device to Detect Cervical Cancer	Sanjeev Verma, S. N. Panda, Rajesh Kumar Kaushal, Naveen Kumar, S. Sreenivasa, Prabin Panigrahi	202411074080
2	Antimicrobial and Teeth Whitening Herbal Toothpaste Formulation	Mansi Chitkara, Arvind Kumar, Rohit Agnish, Naresh Kumar, Rajwinder Kaur, Diksha Choudhary	202411066007
3	Eco Touch Navigator Glove	Ayush Dogra	202411058219
4	Environment Friendly Waste Management Device	Muskan Chawla, Swati Goel, Sanjeev Verma, Surya Narayan Panda, Rajinder Singh, S. Sreenivasa, Prabin Panigrahi	202411069578
5	Fan Suicider Detector	Rishabh Sharma, Vinay Kukreja	202411052218
6	Herbal Tea Bags	Mansi Chitkara, Rohit Agnish, Naresh Kumar	202411066006
7	IoT and Artificial Intelligence based Gastric Cancer Screening System	Amita Salaria, Surya Narayan Panda, Muskan Chawla, Swati Goel, Sonu Goel	202411066010
8	IoT-based Real Time Health Monitoring and Management System	Swati Goel, Kalpna Guleria, Surya Narayan Panda	202411066071
9	Nano-Formulation for Cancer Treatment and Method Thereof	Satyam Kumar Agrawal, Madhunika Agrawal	202411055765
10	Neuroresonance Relaxation System: A Brain-wave Entrainment Device for Stress Reduction and Mental Wellness	Kanwarpartap Singh Gill, Kaushiv Garg, Sheifali Gupta, Rupesh Gupta, Vatsala Anand	202411058220
11	Rejuvenate - A Responsible and Sustainable Alternative for Plastic	Sunita Mehta	202411058222
12	Remotely Controlled Smart Featured Aqua Clean Chalkboard System	Priya Jindal, Diyaa, Ansh Jindal, Rashmi Aggarwal, Sanjeev Verma, Muskan Chawla	202411074081
13	Remotely Monitored Feeding System with the Provision of Auto-Mode for Parkinson's Patients or Patients with Disability	Sanya Sagar, Ravinder Pratap Singh, Manan Bhasin, Aashish Kumar, Mansi Chitkara, Anku Goel	202411066029
14	Smart Cold Coffee Cup	Kamini, Chirag Kumar	202411066011
15	Smart-Featured Hospital Bedside Service Table with Hygienic-Aid Facility	Sanjeev Verma, Dev Gupta, Akul Sikand, Gaurav Kumar Bansal	202411066031

S. No.	Title	Inventors	Application Number
16	Substrate Holder System for Performing Cladding Process	Maninderjeet Singh, Abhineet Saini, Nitin Kumar Saluja, Varinder Singh	202411066070
17	Temp-Comfort Shoe	Sunita Mehta, Kulbhushan Sharma, Mudita	202411058221
18	Zedoary Radiance Face Pack	Rajwinder Kaur, Mansi Chitkara, Diksha Choudhary, Arvind Kumar, Chef Naresh Kumar, Chef Rohit Agnish	202411066009

INDUSTRIAL DESIGN REGISTRATIONS

19. AR Smart Glass with Ear Pods

By: *Parthasarathy PK, Vikram Bahadur Singh, Rajasekaran. P, Naveen Kumar, Karthick B*

Application No. 428971-001

20. Ergonomic Featured Commode Wheelchair with Dual Seat Facility

By: *Naveen Kumar, Sanjeev Verma, Surya Narayan Panda, Rajesh Kumar Kaushal, Sonu Goel*

Application No. 430709-001

21. Spectacles with Embedded Wiper

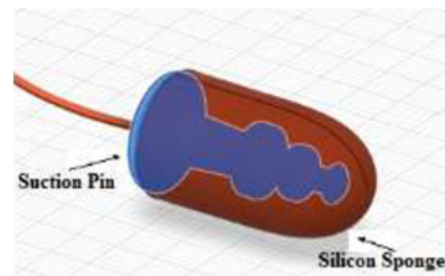**By**: *Bhanu Sharma, Sheena Angra, Sanchit, Amandeep Singh, Ankit Sharma, Deepika Sharma*

Application No. 425476-001

22. Suction Seal Ear Guard

By: *Rakesh Goyal, Harshdeep Singh, Punam, Dhawal Goyal*

Application No. 432320-001

Events Attended by CURIN and CRIO Faculty Members

Workshops, Faculty Development Programs, and Paper Presentations in Conferences

**Paper Presentations in Conferences**

- Dr. Deepali Gupta (Professor, CURIN), Dr. Mudita (Assistant Professor, CURIN), and Monica Dutta (PhD Scholar) presented their research work at the 4th Asian Conference on Innovation in Technology held on August 23-24. Monica Dutta and Dr. Deepali Gupta presented papers at the Asian Conference on Intelligent Technologies organized by Dr. T. Thimmiah Institute of Technology, Kolar, on September 6-7, and 3rd International Conference for Advancement in Technology held on September 13-15. Dr. Mudita presented a paper at the 2nd International Conference on Sustainable Computing and Smart Systems organized by Hindustan College of Engineering and Technology, Coimbatore, during July 10-12. Tanishq Soni (Research Scholar) presented a conference paper at the 3rd IEEE World Conference on Applied Intelligence and Computing conducted on July 27-28.

- Researchers and scholars from the VLSI Centre of Excellence (CURIN), under the guidance of Dr. Rahul Pandey and Dr. Jaya Madan, Assistant Professors, at CRIO, showcased their research at several prestigious conferences, representing our institution on notable academic platforms. Among these contributions, Savita Rawat (ME Scholar) presented a paper at the 2nd International Conference on Sustainable Computing and Smart Systems (ICSCSS), Hindusthan College of Engineering and Technology, Coimbatore, India (10-12 July). The paper was titled 'Investigating the Ideal Acceptor Density to Boost Photovoltaic Efficiency in Perovskite Solar Cells Utilizing MASnBr3'. Savita Rawat also presented two papers in the 1st International Conference on Electronics, Communication, and Signal Processing (ICECSP 2024), held at the National Institute of Technology, Delhi, 8-10 August. The paper was titled 'Numerical Analysis for Modelling CIGS-Based Solar Cells with Varying Absorber Layer Defect Density' and 'Enhancing the Photovoltaic Performance of CIGS-based Solar Cells by Varying their Thickness'.

  Aniket Verma (ME Scholar) presented three papers in the 3rd International Conference on Control, Computing, Communication and Materials 2024, United Group of Institutions, Prayagraj, 10-11 August. The titles of these papers were, 'Tailoring CZTSSe Solar Cells: Exploring Absorption Layer Thickness for Enhanced Photovoltaic Performance', 'Optimizing Cs-Perovskite Performance through Defect Optimization: SCAPS-1D Simulation Study', and 'Investigating the Influence of Cs-Based Perovskite Active Layer Thickness on Photovoltaic Parameters'. Aniket Verma presented another paper in the 4th Asian Conference on Innovation in Technology (ASIANCON), Pimpri Chinchwad College of Engineering & Research, Pune, 23-25 August. It was titled 'Interface Defect Density Effects on TiO2/NH2(CH2)2NH3MnCl4/Spiro-OMeTAD Solar Cell Photovoltaic Performance'.

- Dr. Sonam Mittal – Assistant Professor, CURIN, presented a research paper titled 'A Dynamic Key Method for OFDM-based Encryption' at the 5th International Conference on Sustainable Innovation in Engineering and Technology 2023, held in Kuala Lumpur, Malaysia. Dr. Sonam Mittal and her scholar, Ankita Sharma presented research papers titled 'Breast Cancer Prediction using AdaBoost and XGBoost Classifier' and 'Deep Learning Approach-Improved CNN Model for Breast Cancer Classification' at the 3rd IEEE Worlds Conference on Applied Intelligence and Computing.

- Shagun Sharma - Research Scholar, working under Dr. Kalpna Guleria – Professor, Research, CURIN, presented a research paper titled 'A Diligent Fine-tuned MobileNetV2 Model for Pistachio Seeds Classification' in

the prestigious 5th IEEE India Council International Subsections Conference (INDISCON 2024) on August 22 at PEC University of Technology, Chandigarh. She also presented a paper titled 'A Privacy-Protected Federated Learning with Cross-Silo Brain Tumour Dataset for Glioma Detection' in the 4th International Conference on Computing, Analytics and Networks (ICAN 2024) held on September 24-25. In the same conference, Seema Gulati – PhD Scholar, presented a paper titled 'Collaborative, Privacy-Preserving Federated Learning Framework for the Detection of Diabetic Eye Diseases'.

Faculty Development Programs (FDPs), Workshops, and Short Course Attended

- Dr. Sonam Mittal participated in a one-week online teachers' training program on Recent Trends in Machine Intelligence and Quantum Computing for Industry. The program was organized by Amity University, Madhya Pradesh, and took place from July 1 to 5.

- Priyanka Datta, PhD scholar, Immersive and Interactive Technologies Lab, CURIN, Dr. Mudita and Monica Dutta attended a workshop on Research Performance Assessment Solution using SCOPUS tools organized by Chitkara University Accreditation and Quality Assurance Cell, Chitkara University, Punjab, on July 13.

- Dr. Mudita and Monica Dutta participated in a workshop on Professional Visualization of Flowcharts using MS Visio on July 23-24, which was organized by the Office of PhD Programs, CURIN, Chitkara University, Punjab. Monica Dutta participated in a webinar on Developing Effective AI Policies in Academic Institutions organized by the Association of Indian Universities and Turnitin on July 16.

- Dr. Rakesh Goyal – Professor, CURIN, attended a Short-Term Course on Professional Development for IQAC Coordinators, which was organized by UGC-Malaviya Mission Teacher Training Centre during August 1-8. This program featured esteemed resource persons who provided insights on the seven NAAC criteria for institutional development,
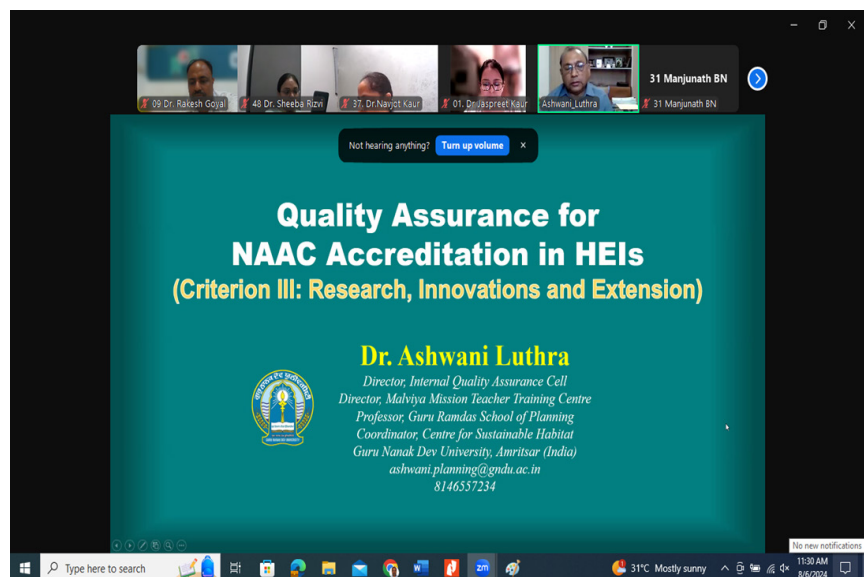
covering curricular aspects, teaching, research, governance, and institutional values. The interactive sessions fostered collaboration among faculty members who discussed challenges and shared best practices. This course equipped participants with actionable strategies for enhancing institutional quality, promising positive impacts on academic and administrative performance.

- Dr. Kalpna Guleria, Shagun Sharma, and Seema Gulati attended a workshop on Image Processing for Biomedical Applications that was jointly organized by CSIO Chandigarh and PEC University of Technology, Chandigarh, on September 11. This insightful event focused on the cutting-edge advancements in biomedical imaging and its applications in healthcare. The workshop featured leading experts in the field, including Prof. Dinesh Kant Kumar from RMIT University, Australia and Dr. Prasant Mahapatra from CSIR-CSIO Chandigarh, who provided in-depth insights into how image processing is transforming biomedical diagnostics and research.

- Dr. Sanjhi Paliwal – Assistant Professor, CRIO, attended a conference titled Breaking Barriers for Gender and Health Equity Through Research, which was organized by Nature group on September 10. This global conference comprised a combination of keynote talks, fireside chats and panel discussions that explored some of the key challenges at the intersection of the United Nations' Sustainable Development Goal 10 - Reduce Inequalities, Goal 5 - Gender Equality, and Goal 3 - Good Health and Well-being. The key aspect of this conference was breaking barriers and making connections across genders, between early and late careers, and between researchers, policymakers and health practitioners.

She also attended the 3rd Annual Symposium of Leigh Syndrome on September 17, which was organized by the Cure Mito Foundation. The aim of this symposium was to spread awareness of the Leigh syndrome, a severe neurometabolic disorder largely affecting paediatric population. This event served as a platform for eye-opening discussions on recent work being done in this field by global scientists.

LIST OF PUBLICATIONS

123 publications by CURIN and CRIO

[1] A. Arya, R. Kaur, D. Goyal, D. Gupta, Shilpa, and S. Juneja, "Insomnia Detection using Machine Learning Classifiers," in *International Conference on New Frontiers in Communication, Automation, Management and Security (ICCAMS)*, pp. 1–6, 2023.

[2] X. Lyu, S. Rani, S. Manimurugan, C. Maple, and Y. Feng, "A Deep Neuro-Fuzzy Method for ECG Big Data Analysis via Exploring Multimodal Feature Fusion," *IEEE Transactions on Fuzzy Systems*, vol. 14, no. 8, 2024.

[3] A. Barsotti, G. Gianini, C. Mio, J. Lin, H. Babbar, A. Singh, F. Taher, and E. Damiani, "A Decade of Churn Prediction Techniques in the TelCo Domain: A Survey," *SN Computer Science*, vol. 5, no. 4, p. 404, 2024.

[4] A. Chopra, N. Kumar, and R.K. Kaushal, "A Comprehensive Analysis of Driver Drowsiness Detection Techniques," *Applied Data Science and Smart Systems*, pp. 134-139, 2025.

[5] A. Dogra, B. Goyal, D.C. Lepcha, A. Alkhayyat, D. Singh, D.P. Bavirisetti, and V. Kukreja, "Effective Image Fusion Strategies in Scientific Signal Processing Disciplines: Application to Cancer and Carcinoma Treatment Planning," *Plos one,* vol. 19, no. 7, 2024.

[6] A. J. Nair and S. Manohar, "Green Service Consumption: Unlocking Customer Expectations on Technological Transformations Enhancing Purchase Experience in Retail Store," *International Journal of Information Management Data Insights*, vol. 4, no. 2, p. 100277, 2024.

[7] A. J. Nair, S. Manohar, and A. Mittal, "AI-enabled Fintech for Innovative Sustainability: Promoting Organizational Sustainability Practices in Digital Accounting and Finance," *International Journal of Accounting & Information Management*, 2024.

[8] A. Kataria, G. Singh, and J. K. Sandhu, "Emotional Analysis of Drug Addicted Patients using Virtual Reality Therapy and EEG Signals," in *14th International Conference on Computing Communication and Networking Technologies (ICCCNT)*, pp. 1–6, 2023.

[9] A. Kumar, C. Ranjan, K. Kumar, M. H. Reddy, B. S. Babu, and J. K. Katiyar, "State-of-the-Art on Advancements in Carbon–Phenolic and Carbon–Elastomeric Ablatives," *Polymers*, vol. 16, no. 11, p. 1461, 2024.

[10] A.M. Sharma, R. Vig, A. Dogra, B. Goyal, A. Alkhayyat, V. Kukreja, and Manob Jyoti Saikia, "Enhanced Low-Light Image Fusion through Multi-Stage Processing with Bayesian Analysis and Quadratic Contrast Function," *Scientific Reports,* vol. 14, no. 1, p. 16987, 2024.

[11] A. Mukil, S. Mittal, Y. S. Susiapan, and C. H. C. Alexander, "A Dynamic Key Method for OFDM-based Encryption," in *AIP Conference Proceedings*, AIP Publishing, vol. 3161, no. 1., 2024.

[12] A. S. Chopra and S. Manohar, "Rise of Clone-Leadership in the Shadow of Artificial Intelligence," in *Impact of New Technology on Next-Generation Leadership, IGI Global,* pp. 120–136, 2024.

[13] A. S. Chopra, S. Manohar, and S. Agarwala, "Influence of Industry-Academia Collaboration on Technology Maturity and Employment Generation: A Conceptual Framework," in *Fostering Industry-Academia Partnerships for Innovation-Driven Trade, IGI Global*, pp. 111–122, 2024.

[14] A. Sharma, A.K. Singh, K. Singh, A.P.S. Sachan, and A.S Uppal, "Parametric Optimization for Material Removal Rate During Face Milling: Using Experimental and Mathematical Modelling Approach," in *International Conference on Mechanical Engineering: Researches and Evolutionary Challenges*, pp. 11-23, 2023.

[15] A. Sharma, A.S. Uppal, B.P. Pathri, A. Babbar, C. Prakash, "Modern Hybrid Machining and Super Finishing Processes: Technology and Applications*," CRC Press*, 2024.

[16] A. Sharma, S. Rani, and M. Driss, "Hybrid Evolutionary Machine Learning Model for Advanced Intrusion Detection Architecture for Cyber Threat Identification," *PloS one*, vol. 19, no. 9, p. e0308206, 2024.

[17] A. Sharma, V. Jain, and D. Gupta, "In-situ Experimental Investigation using Chemical-Assisted Rotary Ultrasonic Drilling Process on Fragile Material," *International Journal on Interactive Design and Manufacturing (IJIDeM)*, pp. 1-10, 2024.

[18] A. Taneja, S. Rani, M. Shabaz, M. A. Khan, A. I. Alzahrani, and N. Alalwan, "Resource Control in Active IRS-Aided 6G IoT Networks with Use Case in Smart Indoor Communication," *Journal of Circuits, Systems and Computers*, p. 2450308, 2024.

[19] A.P. Sharma, J. Singh, Y. Gulzar, D. Gupta, and M. Kumar, "Sustainable Energy Efficient Workflow Classification and Scheduling in Geo Distributed Cloud Datacenter," *Discover Sustainability*, vol. 5, no. 1, p. 128, 2024.

[20] B. Goyal, A. Dogra, A. Jalamneh, D.C. Lepcha, A. Alkhayyat, R. Singh, M.J. Saikia, "Detailed-based Dictionary Learning for Low-Light Image Enhancement using Camera Response Model for Industrial Applications," *Scientific Reports*, vol. 14, no. 1, p. 17122, 2024.

[21] B. Verma, B. Singla, and A. Mittal, "Driving Decentralization and Disruption with Digital Technologies," *IGI Global*, 2024.

[22] B. Verma, B. Singla, and A. Mittal, "Digital Technologies, Ethics, and Decentralization in the Digital Era," *IGI Global*, 2024.

[23] B.K. Ravidas, A.R. Kumar, A. Praveen, S.K. Agnihotri, S. Bhattarai, R. Pandey, J. Madan, "Integration of SCAPS-1D and Density Functional Theory for the Performance Evaluation of RbGeI3-based Perovskite Solar Cell," *Journal of Physics and Chemistry of Solids*, vol. 196, p. 112325, 2025.

[24] C. Pownraj, B. Prabhu, J. K. Katiyar, S. Sethu, and A. V. Arasu, "Cu MOF-biocarbon Functional Catalysts as Adsorbent for Oxygen-Linked Carbon Capture Via Thermo-Catalytic Pyrolysis: A Low-Carbon Fuel Synthesis Strategy," *International Journal of Thermofluids*, vol. 23, p. 100746, 2024.

[25] D. Gahlawat, J. Kaur, R. Basu, A.K. Sharma, U. Rani, J. Madan, and R. Pandey, "Advanced Numerical Modeling of BaZrS3 Chalcogenide Perovskite Cells: Titanium Alloying and Back Surface Field Effects," *Solar Energy*, vol. 282, p. 112948, 2024.

[26] D. Kumar and V. Kukreja, "A Novel Cross-SVM Framework for Wheat Rust Disease Recognition through Multimodal Fusion of Images, Mask R-CNN, and DenseNet," *GMSARN International Journal*, vol. 19, 2024.

[27] D. Kumar and V. Kukreja, "Heritage Conservation Through AI: Caves Object Recognition in Monuments using STYLE GAN and Faster RCNN Object Detector," *GMSARN International Journal*, vol. 19, 2024.

[28] D. Upadhyay, M. Aeri, V. Kukreja, and R. Sharma, "Improving Anthracnose Severity Grading in Green Beans through CNN-LSTM Integration," in *International Conference on Innovations and Challenges in Emerging Technologies (ICICET)*, pp. 1–4, 2024.

[29] D. Upadhyay, M. Manwal, V. Kukreja, and R. Sharma, "A Fine-Tuned YOLOv5 and Exception Model for Oral Cancer Detection," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–5, 2024.

[30] D. Upadhyay, M. Manwal, V. Kukreja, and R. Sharma, "Deep Learning-based VGGNet, GoogleNet, and DenseNet121 Models for Cervical Cancer Prediction," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–6, 2024.

[31] F. B. Sumona, M. Kashif, J. Madan, A. S. M. Metwally, E. Danladi, and Nahid-Al-Mahmud, "Optimization of Lead-free KSnI3 Perovskite Solar Cell by Numerical Simulation with Enhanced Efficiency of 20.34%," *Journal of Optics*, pp. 1-15, 2024.

[32] G. S. Kesharwani, K. K. Billa, J. Verma, S. K. Garg, J. K. Katiyar, and S. Kumar, "Influence of Tool Velocity Ratio On Force-Torque and Mechanical Properties of Friction Stir Welded 2050-T84 Al-Li alloy plates," *Physica Scripta*, vol. 99, no. 7, p. 075008, 2024.

[33] G. Singh, A. Kataria, S. Jangra, R. Dutta, A. Mantri, J.K. Sandhu, and T. Sabapathy, "Augmented Reality and Virtual Reality: Transforming the Future of Psychological and Medical Sciences," *Smart Distributed Embedded Systems for Healthcare Applications*, pp. 93-118, CRC Press, 2023.

[34] H. Babbar and S. Rani, "Integrating Optical Security Management with Optical-Layer Controller Architecture for Enhanced Network Security," *Internet Technology Letters*, p. e558, 2024.

[35] H. Babbar, S. Rani, and W. Boulila, "Fortifying the Connection: Cybersecurity Tactics for WSN-driven Smart Manufacturing in the Era of Industry 5.0," *IEEE Open Journal of the Communications Society*, 2024.

[36] I. Govindharaj, K. Rajput, N. Garg, V. Kukreja, and R. Sharma, "Enhancing Rice Crop Health Assessment: Evaluating Disease Identification with a CNN-RF Hybrid Approach," in *International Conference on Innovations and Challenges in Emerging Technologies (ICICET)*, pp. 1–5, 2024.

[37] I. Govindharaj, N. Thapliyal, M. Aeri, V. Kukreja, and R. Sharma, "Onion Purple Blotch Disease Severity Grading: Leveraging a CNN-VGG16 Hybrid Model for Multi-Level Assessment," in *International Conference on Innovations and Challenges in Emerging Technologies (ICICET)*, pp. 1–5, 2024.

[38] I. Govindharaj, N. Thapliyal, M. Manwal, V. Kukreja, and R. Sharma, "Enhancing Mango Quality Evaluation: Utilizing an MLP Model for Five-Class Severity Grading," in *International Conference on Innovations and Challenges in Emerging Technologies (ICICET)*, pp. 1–4, 2024.

[39] I. Govindharaj, S. Chattopadhyay, K. Joshi, V. Kukreja, and R. Sharma, "Improving Beech Bark Disease Classification: A Multiclass Approach with CNN-MLP Fusion," in *International Conference on Innovations and Challenges in Emerging Technologies (ICICET)*, pp. 1–4, 2024.

[40] I. Seth, K. Guleria, and S.N. Panda, "Evaluation and Comparison of Routing Protocols for Internet of Vehicles (IoV) Environment," in *International Conference on Mobile Radio Communications & 5G Networks*, pp. 527-538, 2023.

[41] I. Sharma and A. Aggarwal, "Exploring the Relationship Between Tourist Experiences at Creative Tourist Destinations and Their Intentions to Indulge in Co-Creation Activities," in *Shifts in Knowledge Sharing and Creativity for Business Tourism, IGI Global*, pp. 71–87, 2024.

[42] J. K. Mudhar, J. Malhotra, and S. Rani, "A Smart Contract based Automated Cervical Cancer Prediction using Ensemble Machine Learning," in *2nd International Conference on Advancement in Computation & Computer Technologies (InCACCT)*, pp. 298–302, 2024.

[43] J. Singh, S. Singh, H. Vasudev, and J. K. Katiyar, "Artificial Neural Network Model for Wear Characteristic Analysis of WC-10Co4Cr and Stellite 6 Thermal Spray Coatings," *Tribology International*, vol. 199, p. 109924, 2024.

[44] K. Guleria, I. Seth, and S. Sharma, "Smart Health Monitoring Framework for the Prevention of Infectious Diseases," in *4th International Conference on Data Analytics for Business and Industry (ICDABI)*, pp. 239-243, 2023.

[45] K.K. Brar, B. Goyal, A. Dogra, M.A. Mustafa, R. Majumdar, A. Alkhayyat, V. Kukreja, "Image Segmentation Review: Theoretical Background and Recent Advances," *Information Fusion*, p. 102608, 2024.

[46] K. K. Mishra, S. Chahar, and R. Sharma, "An Extensive Investigation of Structural, Electronic, and Optical Properties of Inorganic Perovskite Ca3AsCl3 for Photovoltaic and Optoelectronic Applications: A First-Principles Approach using Quantum ATK Tool," *Solid State Communications*, vol. 390, p. 115623, 2024.

[47] K. K. Mishra, S. Chahar, and R. Sharma, "Machine Learned Analysis of Pnictides based Sr3PnCl3 (Pn = P, As, Sb) Halide Perovskites for Next-generation Solar Applications," *Physics Letters A*, vol. 523, p. 129817, 2024.

[48] K. Kaur, A. Kaur, V. Gandhi, and B. Singh, "Securing IOT CCTV: Advanced Video Encryption Algorithm for Enhanced Data Protection," *Applied Data Science and Smart Systems*, pp. 565-569, 2025.

[49] K. Kaur, A. Kaur, Y. Gulzar, and V. Gandhi, "Unveiling the Core of IoT: Comprehensive Review on Data Security Challenges and Mitigation Strategies," *Frontiers in Computer Science*, vol. 6, p. 1420680, 2024.

[50] L. D, S. N. Jayanthi, S. Chandramohan, R. Manimegalai, L. Nelson, and K. Geetha, "Performance Comparison of Super-Lift Luo-Converter with Filters for High Voltage Applications," in *9th International Conference on Science Technology Engineering and Mathematics (ICONSTEM)*, pp. 1–4, 2024.

[51] L. Fang, Y. Li, M. Shao, A. Yu, B.F. Felemban, A.A. Aly, S. Rani, X. Lyu, "Enhancing Medical Signal Processing and Diagnosis with AI-Generated Content Techniques," *IEEE Journal of Biomedical and Health Informatics*, 2024.

[52] L.K.B Melhim, M. Jemmali, W. Boulila, M. Alazab, S. Rani, H. Campbell, H. Amdouni, "Leveraging Drone-Assisted Surveillance for Effective Forest Conservation: A Case Study in Australia's Daintree Rainforest," *IEEE Internet of Things Journal*, 2024.

[53] L. Sharma, S. Bhati, M. Uppal, and D. Gupta, "The Influence of Compact Modalities on Complexity Theory," *Applied Data Science and Smart Systems*, pp. 307-312.

[54] L. Sharma, S. Bhati, M. Uppal, and D. Gupta, "The Impact of Unstable Symmetries on Software Engineering," *Applied Data Science and Smart Systems, CRC Press*, pp. 582-587, 2024.

[55] M. A. N. Shaikh, P. Ravi, N. N. Roselina, and J. K. Katiyar, "Tribo-corrosion and Mechanical Performance of Electro-Deposited

Nano-composite h-BN/epoxy Coating," *Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology*, vol. 238, no. 10, pp. 1222–1233, 2024.

[56] M. Arora and A. Mittal, "Employees' Change in Perception when Artificial Intelligence Integrates with Human Resource Management: A Mediating Role of AI-Tech Trust," *Benchmarking: An International Journal*, 2024.

[57] M. Arora and A. Mittal, "Enhancing Organizational Performance through HR Analytics Capabilities: Mediating Influence of Innovative Capability and Moderating Role of Technological Turbulence," *The International Journal of Human Resource Management*, pp. 1–34, 2024.

[58] M. Boudraa, A. Bennour, T. Mekhaznia, A. Alqarafi, R.R. Marie, M. Al-Sarem, A. Dogra, "Revolutionizing Historical Manuscript Analysis: A Deep Learning Approach with Intelligent Feature Extraction for Script Classification," *Acta Informatica Pragensia*, vol. 13, no. 2, pp. 251–272, 2024.

[59] M. Ertz, U. Tandon, A. Walid, and M. Takaffoli, "Committing Consumers to Circular Plastic Consumption: The Influence of Situational Variables," Green Urbanism (GU), 2023.

[60] M. Kumar, M. Kumar, A. Sharma, and A. Babbar, "Advancement of Abrasive-Based Nano-Finishing: Processes Principle, Challenges, and Current Applications," *Modern Hybrid Machining and Super Finishing Processes*, pp. 77–106, 2024.

[61] M. Rani, K. Guleria, and S.N. Panda, "35 Enhancing Latency Performance in Fog Computing through Intelligent Resource Allocation and Cuckoo Search Optimization," In *Applied Data Science and Smart Systems: Proceedings of 2nd International Conference on Applied Data Science and Smart Systems*, pp. 256-263, 2023.

[62] N. K. Ojha, D. Upadhyay, M. Aeri, V. Kukreja, and R. Sharma, "Optimizing Anthracnose Severity Grading in Green Beans with CNN-LSTM Integration," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–5, 2024.

[63] N. K. Ojha, D. Upadhyay, M. Manwal, V. Kukreja, and R. Sharma, "Implementing CNN and RF Models for Multi-Level Classification: Deciphering Beetroot Aphid Disease Severity," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–5, 2024.

[64] N. K. Ojha, N. Thapliyal, M. Aeri, V. Kukreja, and R. Sharma, "CNN-VGG16 Hybrid Model for Onion Purple Blotch Disease Severity Multi-Level Grading," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–5, 2024.

[65] N. Kaur, R. Pandey, and J. Madan, "Exploration HTL-Free all Inorganic Mixed Halide Perovskite Solar Cells: effects of 4-ADPA passivation," *Physica Scripta*, vol. 99, no. 8, p. 085533, 2024.

[66] N. Kaur, R. Pandey, and J. Madan, "Machine Learning-Driven Exploration of Cesium-Based All-Inorganic Mixed-Halide Perovskite Solar Cells with a Double Absorber Layer Architecture," *Journal of Electronic Materials*, vol. 53, no. 9, pp. 5361–5373, 2024.

[67] N. Kumar, P. Kumar, and M. Sharma, "Embedded System Controlled Switching System for Reconfigurable Antennas," *Internet Technology Letters*: e561, 2024.

[68] N. Kumar, P. Kumar, and M. Sharma, "Reconfigurable MIMO Antenna for IoT Wireless Applications Controlled by Embedded System," *Journal of Telecommunications and Information Technology*, no. 2, 2024.

[69] N. M. Tripathi and A. Sharma, "Advances in Pre-and Post-Additive Manufacturing Processes: Innovations and Applications," *CRC Press*, 2024.

[70] N. Sharma, M. Arora, U. Tandon, and A. Mittal, "Chatbot Integration for Online shopping: A Bibliometric Review and Future Research Agenda," *Information Discovery and Delivery*, 2024.

[71] N. Shrivastav, M. Aamir Hamid, J. Madan, and R. Pandey, "Exploring KGeCl3 Material for Perovskite Solar Cell Absorber Layer through Different Machine Learning Models," *Solar Energy*, vol. 278, p. 112784, 2024.

[72] N. Srivastava and A. Mittal, "How Does Green Trust Mediate the Relationship between Environmental Concern and Green Brand Knowledge During Green Purchases?," *Global Knowledge, Memory and Communication*, 2024.

[73] N. Thapliyal, M. Manwal, V. Kukreja, and R. Sharma, "Artificial Intelligence-Based ResNet50, Xception, and VGG16 Models for an Efficient Detection of Lung Cancer," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–5, 2024.

[74] N.K. Marriwala, V.K. Shukla, P. William, K. Guleria, R. Sobti, and S. Sharma, "Detection of Viral Messages in Twitter using Context-Based Sentiment Analysis Framework," *International Journal of Information Technology*, pp. 1-7, 2024.

[75] O.R. Lunge, B.K. Ravidas, S. Bhattarai, R. Pandey, J. Madan, M.K. Roy, M.K. Hossain, and D.P. Samajdar, "DFT and SCAPS-1D based Optimization Study of Double Perovskite Cs2AuBiCl6 Solar Cells Utilizing Different Charge Transport Layers," *Journal of Physics and Chemistry of Solids*, vol. 195, p. 112260, 2024.

[76] P. Kashyap, J. Kaushal, and L. Rani, "Remediation Techniques used for Removal of Fluoride from Groundwater: A Concise Review," *Journal of Physics: Conference Series*, vol. 2603, no. 1, p. 012053, 2023.

[77] P. Ravi, E. Arumugam, and J. K. Katiyar, "Investigation of Physical, Mechanical, Tribological and Biodegradable Properties of Hybrid Natural Fibre Reinforced Polymer Composite," *Tribology - Materials, Surfaces & Interfaces*, vol. 18, no. 2, pp. 79–92, 2024.

[78] P. Satishkumar, B. Haldar, N.M. Tripathi, A. Sharma, D.J. Desai, V.K. Sharma, S. Seenivasa, "Effect of Interlayer Temperatures and Heat Inputs on Porosity and Hydrogen Solubility in Wire Arc Additive Manufactured AA2618 Aluminium: A Comparative Study between Pulsed-MIG and CMT Methods," in *Advances in Pre-and Post-Additive Manufacturing Processes, CRC Press*, pp. 137–162, 2024.

[79] P. Satishkumar, R. Kumar, N.M. Tripathi, A. Sharma, D.J. Desai, A. Verma, N. Natarajan, A. Babbar, "Integrating Titanium Coating with 3D-Printed GFRP Panels: An Innovative Approach to Harnessing Composite Strengths in Engineering Applications," in *Advances in Pre-and Post-Additive Manufacturing Processes, CRC Press*, pp. 18–38, 2024.

[80] R. Goyal, and P. Goyal, "Characterization of Thermal Sprayed Inconel718-CNT Coatings on T11 Boiler Steel," in *1st International Conference on Innovative Sustainable Technologies for Energy, Mechatronics, and Smart Systems (ISTEMS)*, pp. 1-5, 2024.

[81] R. Jindal, S.K. Mittal, "Artificial Intelligence and Machine Vision-based Assessment of Rice Seed Quality," *Applied Data Science and Smart Systems, CRC Press*, pp. 603-609, 2024

[82] R. Meena, A.W. Hashmi, F. Iqbal, S. Ahmad, C. Prakash, J.K. Katiyar, H.S. Mali, A. Meena, "Optimizing Surface Finish in FDM-Printed Polycarbonate Spur Gears through Abrasive Flow Finishing: Insights from Physics and Material Science Perspectives," *Physica Scripta*, vol. 99, no. 8, p. 085004, 2024.

[83] R. Ranjan, D. Singh, V. Pandey, A. Sharma, A. S. K. Sinha, and N. M. Tripathi, "A Comprehensive Review on the Machining Process: Unconventional as an Alternative to Conventional Machining," *Advances in Pre-and Post-Additive Manufacturing Processes*, pp. 163–195, 2024.

[84] R. Sharma and V. Kukreja, "Detecting the Past: Advancements in Comic Panel Detection for Cultural Heritage Preservation," in *4th International Conference on Data Analytics for Business and Industry (ICDABI)*, pp. 529–532, 2023.

[85] Rishu and V. Kukreja, "Comic Exploration and Insights: Recent Trends in LDA-Based Recognition Studies," *Expert System with Applications*, vol. 255, p. 124732, 2024.

[86] Rishu, V. Sharma, and V. Kukreja, "Visual Narratives Unveiled: Comic Genre Classification through CNN-SVM Fusion," in *4th International Conference on Innovative Practices in Technology and Management (ICIPTM)*, pp. 1–6. 2024.

[87] S. Angra, B. Sharma, and A. Mantri, "One-Stop Solution for Education: An Immersive Perspective," in *11th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)*, pp. 1–5, 2024.

[88] S. Arora, S. Oberoi, T. Nabi, and B. Verma, "How Does Blockchain Impact Sustainable Food Security? Insights from Literature Review," *International Journal of Information Management Data Insights*, vol. 4, no. 2, p. 100276, 2024.

[89] S. Bhattarai, M. K. A. Mohammed, I. Hossain, P. K. Dakua, R. Pandey, and J. Madan, "Bio-Synthesized ZnO in Cesium based Perovskite Solar Cells: A Pathway to Sustainable High Efficiency," *Solid State Communications*, vol. 393, p. 115671, 2024.

[90] S. Bhattarai, P.K. Dakua, M. Z. Ansari, U. Dudekula, R. Pandey, I. Hossain, and A.A. Ghfar, "Exclusive Optimization Techniques for Cesium based Perovskite Solar Cell for the Efficiency Increment," *Journal of Optics*, pp. 1-12, 2024.

[91] S. Chahar, C. Malan, K. K. Mishra, and R. Sharma, "Optimizing Novel Perovskite Mg3AsBr3 through Uniaxial Stress: A Comprehensive Study of its Potential in Solar and Optoelectronic Applications," *Physica Scripta*, vol. 99, no. 9, p. 095994, 2024.

[92] S. Chahar, K. K. Mishra, and R. Sharma, "Investigation of Structural, Electronic, and Optical Characteristics of a Novel Perovskite Halide, Mg3AsCl3, for Electronic Applications," *Physica Status Solidi (B)*, vol. 261, no. 10, p. 2400171, 2024.

[93] S. Chaurasia, P. Lohia, D.K. Dwivedi, R. Pandey, J. Madan, S. Agarwal, M.K. Hossain, R.K. Yadav, and Y.K. Singh, "Enhancing Perovskite Solar Cell Efficiency to 28.17% by Integrating Dion-Jacobson 2D and 3D Phase Perovskite Absorbers," *Inorganic Chemistry Communications,* vol. 170, p. 113140, 2024.

[94] S. Goel, K. Guleria, S.N. Panda, "Optimization Techniques for Wireless Body Area Network Routing Protocols: Analysis and Comparison," *Applied Data Science and Smart Systems*, pp. 226-235, 2024.

[95] S. Gohri, J. Madan, and R. Pandey, "Tailored Grading Profiles for Enhanced Performance in Dion-Jacobson Perovskite Solar Cells with MXene Contacts," *Physica B: Condensed Matter*, vol. 690, p. 416229, 2024.

[96] S. Jangra, G. Singh, A. Mantri, S. Angra, and B. Sharma, "Interactivity Development Using Unity 3D Software and C # Programming," in *14th International Conference on Computing Communication and Networking Technologies (ICCCNT)*, pp. 1–6, 2023.

[97] S. K. Agrawal and S. S. Jain, "Role of Artificial Intelligence in Advancing Pancreatic Cancer Research," in *Smart Healthcare Systems, CRC Press*, 2024.

[98] S. Manohar, "Cryptocurrency as a Slice in Investment Portfolio: Identifying Critical Antecedents and Building Taxonomy for Emerging Economy," *Asia-Pacific Financial Markets*, pp. 1-26, 2024.

[99] S. Monga, N. Saluja, A. Taneja, C. Prabha, and R. Garg, "Revolutionizing Intelligent Reflecting Surfaces: Deep Learning-Driven Channel Estimation," in *2nd International Conference on Advancement in Computation & Computer Technologies (InCACCT)*, pp. 148-153, 2024.

[100] S. Monga, N. Saluja, C. Prabha, R. Garg, A.K. Bairagi, and M.M. Hassan, "Optimising Multi-User Wireless Networks through Discrete Fourier Transform-based Channel Estimation with Cascaded Intelligent Reflecting Surfaces," *IET Wireless Sensor Systems*, 2024.

[101] S. Naik, A. Upmanyu, and M. Sharma, "A Review of Multi-Band Flexible MIMO Antenna Design on Thin Substrate for High Diversity Performance," in *International Conference on Electronics, Computing, Communication and Control Technology (ICECCC)*, pp. 1–6, 2024.

[102] S. Oberoi, S. Arora, B. Verma, and K. K. Roy, "What Do We Know About Artificial Intelligence and Blockchain Technology Integration in the Healthcare Industry?," in *Driving Decentralization and Disruption With Digital Technologies, IGI Global*, pp. 124–138, 2024.

[103] S. Paul, R. Kaushik, S. Upadhyay, A. Akhtar, P. Chawla, N. Kumar, S. Sharma, and P. Rani, "The Utilisation of Mushroom Leftovers, Oats, and Lactose-Free Milk Powder for the Development of Geriatric Formulation," *Foods*, vol. 13, no. 11, p. 1738, 2024.

[104] S. Rani, A. Sharma, and M. Zohaib, "Study for Integrating IoT-IDS Datasets: Machine and Deep Learning for Secure IoT Network System," in *Proceedings of the 28th International Conference on Evaluation and Assessment in Software Engineering*, pp. 686-691, 2024.

[105] S. Shamas, S.N. Panda, I. Sharma, K. Guleria, A. Singh, A. A. AlZubi, and M.A. AlZubi, "An Improved Lung Cancer Segmentation Based on Nature-Inspired Optimization Approaches," *CMES-Computer Modeling in Engineering & Sciences*, vol. 138, no. 2, 2024.

[106] S. Sharma and K. Guleria, "A Federated Learning Mechanism for Preserving Security of Sensitive Data," in *4th International Conference on Data Analytics for Business and Industry (ICDABI)*, pp. 1–5, 2023.

[107] S. Sharma, K. Guleria, and R. Sobti, "An Early Detection of Parkinson's Disease using Machine Learning and Deep Learning Models," in *International Conference on Computational Intelligence and Computing Applications (ICCICA)*, pp. 154–159, 2024.

[108] S. Sharma, K. Guleria, S. Tiwari, and S. Kumar, "An Enhanced DarkNet53-based YOLOv3 Feature Pyramid Network for Real-Time Object Detection," in *International Conference on Computational Intelligence and Computing Applications (ICCICA)*, pp. 148–153, 2024.

[109] S. Sharma, K. Guleria, S. Tiwari, and S. Kumar, "Feature Driven Machine Learning Models for Early Parkinson's Disease Detection in Healthcare Datasets," in *5th International Conference for Emerging Technology (INCET)*, pp. 1–5, 2024.

[110] S. Sharma, K. Guleria, S.N. Panda, and R. Sobti, "A Deep Learning-based EfficientNetB0 Smoker Surveillance System for Enhancing Public Safety," in *5th International Conference for Emerging Technology (INCET)*, pp. 1-6. IEEE, 2024.

[111] S. Singh and S. Manohar, "Impact of Service Quality, Relational Trust and Attitude on the Intention to Pursue Higher Education Within a Country, than Abroad," *International Journal of Educational Management*, 2024.

[112] Shruti, S. Rani, and W. Boulila, "Securing Internet of Things Device Data: An ABE Approach using Fog Computing and Generative AI," *Expert Systems*: e13691, 2024.

[113] T. Hasija, K. R. Ramkumar, B. Singh, A. Kaur, and S.K. Mittal, "Newton Raphson Method for Root Convergence of Higher Degree Polynomials using Big Number Libraries," in *Applied Data Science and Smart Systems*, pp. 298-306, 2025.

[114] T. Quang-Huy, B. Sharma, L.T. Theu, D.T. Tran, S. Chowdhury, C. Karthik, S. Gurusamy, "Frequency-hopping Along with Resolution-turning for Fast and Enhanced Reconstruction in Ultrasound tomography," *Scientific Reports*, vol. 14, no. 1, p. 15483, 2024.

[115] U. Chawla, B. Verma, and A. Mittal, "Unveiling barriers to O2O technology platform adoption among small retailers in India: insights into the role of digital ecosystem," *Information Discovery and Delivery*, 2024.

[116] U. Tandon, M. Taneja, and A. Mittal, "AI in the Field of Healthcare: A New Paradigm Examining Facilitators and Biases Through SEM-ANN," *International Journal of Human–Computer Interaction*, pp. 1–17, 2024.

[117] V. Adimule, V. Sharma, P. Kumar, R. Keri, and K. Sharma, "Perylene-3, 4, 9, 10-Tetracarboxylic Dianhydride Dye Intercalated Liquid Crystal Molecules: Synthesis, Spectroscopic Characterizations and Photoluminescence Dynamics," *Journal of Molecular Liquids*, vol. 413, p.125990, 2024.

[118] V. Kumar, A. Mistri, A. Babbar, V. Dhawan, R. Kumar, L.K. Singh, A. Sharma, "Biomimicry-Inspired Design of Sustainable Composite Materials," in *Fabrication Techniques and Machining Methods of Advanced Composite Materials*, *CRC Press*, pp. 119–136, 2024.

[119] V. Sudan and S. Paliwal, "The interplay of cytokines in bovine tropical theileriosis: a mini review," *Tropical Animal Health and Production*, vol. 56, no. 5, p. 174, 2024.

[120] W. M. Lim, A. Aggarwal, V. Singh, and R. Gopal, "Leader–Member Exchange and Service-Oriented Organizational Citizenship Behavior: A Mediation-Moderation Model of Employee Envy and Psychological Empowerment Among Hotel Frontline Employees," *International Journal of Hospitality & Tourism Administration*, pp. 1–30, 2024.

[121] X. Lyu, S. Rani, and Y. Feng, "Optimizing AIGC Service Provider Selection Based on Deep Q-Network for Edge-enabled Healthcare Consumer Electronics Systems," *IEEE Transactions on Consumer Electronics*, 2024.

[122] Y.K. Singh, D. K. Dwivedi, P. Lohia, R. Pandey, J. Madan, S. Agarwal, R.K. Yadav, F. Alsaif, and M.K. Hossain, "Current Matching and Filtered Spectrum Analysis of Wide-Bandgap/Narrow-Bandgap Perovskite/CIGS Tandem Solar Cells: A Numerical Study of 34.52% Efficiency Potential," *Journal of Physics and Chemistry of Solids*, vol. 196, p. 112300, 2025.

[123] Z. Song, W. Chen, T. Gong, S. Rani, W. Wei, and G. Feng, "Cloud-Edge Collaborative Computing for Consumer Electronics via Deep Reinforcement Learning," *IEEE Transactions on Consumer Electronics*, 2024.

Published by:

CHITKARA
UNIVERSITY

PUNJAB