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CURIN
Chitkara University
Research & Innovation
Network

CURIN Research and Development News

Volume 2023, Issue 4

R&D Activities During October–December 2023

COVER STORY
Big Win for CURIN in the
8th Annual Excellence Awards

HIGHLIGHTS

- Several International Research Collaboration Initiated
- International Conferences and Symposium Organized – IIDM 2023, ICEMSMCI 2023 and CUDC 2023
- Awards and Recognition for CURIN Faculty Members
- DST Funded STEM Projects Exhibition Organized
- Insights CURIN – Workshop on Plasmid Vector Cloning and Cell Culture Techniques by CLS

169 Research Publications

131 Patents Granted

★★★★
4-star rating for the Chitkara University IIC by the MoE Innovation Cell

CONTENTS

Editorial

Congratulations to my colleagues at CURIN who have won awards, incentive, and recognition at the 8th Annual Excellence Awards of Chitkara University that was held on December 17, 2023. In total, our university awarded INR 1.89 Crore as incentive to 600 faculty members of the university. Kudos to all the winners! The cover story of the current issue is about the Excellence Awards 2023, with a special focus on achievements of CURIN faculty members. Speaking of achievements, several CURIN faculty members won accolades in different external forums. The details of all those achievements have been included in this issue.

CURIN conducted three major conferences/symposiums in Q4, 2023, including International Conference on Emerging Materials, Smart Manufacturing and Computational Intelligence; Chitkara University Doctoral Consortium; and International Symposium on Interventions and Innovations for Diabetes Management. All these forums witnessed a very good participation and benefitted a large number of students, researchers, and industry professionals, as you will find the details inside.

CURIN also conducted a STEM Projects Exhibition for school students to mark the completion of a two-year DST funded project of the NCSTC division. The exhibition was attended by 200 students from 9 participating schools. In addition to these key programs, CURIN also conducted a large number of activities and workshops on multiple topics and in multiple fields, all of which have been included in the newsletter.

One of the key focus areas of CURIN is to promote international collaboration, especially in the area of research. A few MoUs were executed between Chitkara University and the universities abroad in the last quarter of 2023, and there is a story in this issue that covers the details of these collaboration.

In this issue of the newsletter, you will find many diverse and resourceful stories on a variety of initiatives and activities of Chitkara University Research and Innovation Network (CURIN). You may reach out to us should you wish to work/collaborate with CURIN in any capacity.

Happy Reading!

Sagar Juneja, PhD
Editor, Res Novae
Associate Director (Research)
Chitkara University Research & Innovation Network (CURIN), Chitkara University, Punjab

8th Edition of the Annual Excellence Awards Organized by Chitkara University

Big Win for CURIN Faculty Members in the Awards Function

Continuing the annual tradition of awarding and rewarding the top performers of the university, Chitkara University organized the 8th edition of the Annual Excellence Awards function on December 17, 2023, under the patronage of Dr. Ashok K Chitkara – Chancellor, Chitkara University and Dr. Madhu Chitkara – Pro-Chancellor, Chitkara University, who awarded and felicitated the 168 winners in six different categories. These award categories being Publications, Consultancy, Extramural Funding, PhD Supervision, Filing Patents, and Entrepreneurial Venture.

It is noteworthy that in each of these six areas, which are also the award categories, Chitkara University has seen phenomenal success over the past few years. We have grown from just INR 2.4 Crore of extramural funding in 2015 to INR 84 Crore in 2023. The valuation of industry consultancy projects completed by our faculty members has gone up to INR 22.84 Crore in 2023 from INR 1.3 Crore in 2017. Till December 2023, Chitkara University has filed 3187 patent applications, out of which 756 have been granted so far. The number of research publications of our university is a whopping 6647, out of which 1729 papers have been published by collaborating with authors from 106 countries. Additionally, there are 156 start-ups incubated by Chitkara University's incubator and their total valuation is INR 350 Crore as on date.

Chitkara University deeply values the contributions of its faculty members to this remarkable success, and the Annual Excellence Awards function is organized to recognize and reward their contributions. **This year, a total cash incentive of INR 1.89 Crore was awarded to 600 faculty members, of which 168 faculty members were awarded on the stage.**

The award function was spearheaded by Dr. Archana Mantri – Vice Chancellor, Chitkara University, Punjab, and it was attended by over 800 faculty members of Chitkara University.

Out of the total 168 award winners of the year 2023, 7 are the Mega Stars of Chitkara University who were the top performers in 5 or more award categories. Similarly, there are 8 Super Stars who were awarded in four categories, 17 Stars as their named featured in three categories, 38 Commendable Performers as they stood out in two categories, and finally 98 Top Performers in one category each.

It was a big achievement for CURIN in the 8th Annual Excellence Awards, as out of the 7 Mega Stars, 4 are from CURIN and out of the 8 Super Stars, 3 are from CURIN.

The details of the 4 Mega Stars of Chitkara University from CURIN are as follows.

- Dr. Jaya Madan – Assistant Professor, received this recognition for publishing in a top-quality journal having H-index of 282. She featured in the list of top 2% scientists of the world by the Stanford University and she produced some top quality publications in the year.
- Dr. Shalli Rani – Director Research, is one of the Best Innovator for filing good patents and one of the Best PhD Supervisors. She published in top-quality journals, with one of her publications is in a journal having an impact factor of 10.02.
- Dr. Vinay Kukreja – Director, Research, published in a journal with H-index of 404. He is one of the Best Innovators, Best PhD Supervisors and he holds a very high publication score.
- Dr. Amit Mittal – Pro-VC (Research Programs), is one of the Best Innovators, Best PhD Supervisors and is the author of a publication with an impact factor of 10.97.

Additionally, these 4 Mega Stars of CURIN hold the individual H-index greater than 20 and they received a maximum cash incentives in the awards function for their contributions.

The details of the 3 Super Stars of Chitkara University from CURIN are as follows.

- Dr. Bhisham Sharma – Associate Professor, featured in the list of top 2% scientists of the world by the Stanford University, he holds the individual H-index greater than 20, and he is among the top-10 performers in terms of number of publications and quality of publications.
- Dr. Rahul Pandey - Assistant Director (Research), is also among the top-10 performers in terms of number of publications and quality of publications. His individual H-index is greater than 20 and one of his publications is in the journal having H-index of 282.
- Dr. Ayush Dogra - Assistant Director (Research), is having a i-10 index greater than 20. He has published in a journal having H-index of 404 and featured in the list of top-10 for the number of publications in a year. He is also the Debutante of the year 2023.

The names of the Stars of Chitkara University from CURIN who received awards in three categories in the awards function are as follows. Dr. Arun Aggarwal (Assistant Professor, DRC, CBS), Dr. Ashu Taneja (Assistant Professor), Dr. Sridhar Manohar (Assistant Professor, DRC, CBS), Dr. Manish Sharma (Director, Research), Dr. Urvashi Tandon (Assistant Professor, DRC, CBS), and Dr. Deepali Gupta (Professor).

The Commendable Performers received awards in two-categories, and from CURIN these Commendable Performers are Dr. Praveen Kumar Khosla (Pro-VC), Dr. Surya Narayan Panda (Pro-VC), Dr. Jyotsna Kaushal (Professor), Dr. K.R. Ramkumar (Professor), Dr. Nitin Kumar Saluja (Director), Dr. Naveen Kumar (Associate Professor), Dr. Sagar Juneja (Associate Director), Dr. Vatsala Anand (Assistant Professor), and Dr. Varsha Singh (Assistant Professor).

The Top Performers received award in one category each. The Top Performers from CURIN include Dr. Sheifali Gupta, Dr. Leema Nelson, Dr. Mudita, Dr. Rupesh Gupta, Dr. Neeraj Kumar, Dr. Adarsh Kumar Aggarwal, Dr. Amanpreet Kaur, Dr. Bhanu Sharma, Dr. Partha Khanra, Dr. Sudesh Kumar Mittal, Mr. Varinder Singh, Dr. Mansi Chitkara, Dr. Satyam Kumar Agrawal, and Dr. Rakesh Goyal.

Additionally, top performers among the PhD scholars as well as Master of Engineering scholars were also recognized and incentivised for publishing good quality journal papers. The names of all these scholars are Mir Aamir Hamid, Navdeep Kaur, Nikhil Srivastav, Shivani, Deepak Kumar, Shiva Mehta, Rishabh Sharma, Pratibha Sharma, Shagun Sharma, Ashi Mannan, Kanwar Partap Singh, Deepak Banerjee, Rahul, Atul Kumar, Anshika Sharma, Vishal Yadav, Kanwar Partap Singh and Gunjan Sharma.

Felicitation of the Faculty Members for Winning External Awards and Laurels

There are several faculty members from the different departments of the university who won laurels and awards from various external agencies in the academic year 2022-23. All recipients of such recognitions from the external agencies were felicitated in the 8th Annual Excellence Awards of Chitkara University. The details are as follows.

- Dr. Archana Mantri (Professor, CURIN and VC Chitkara University, Punjab) received the Award of Honour from the Punjab State Pharmacy Council, Association of Pharmaceutical Teachers of India.
- Dr. Sandhir Sharma (Professor and Pro-VC, Chitkara Business School) received the Best Researcher Award from the Association VDGood Foundation.
- Dr. Shivani Malhotra (Professor and Dean, Department of Electronics & Communication Engineering) has been elevated to the IEEE Senior Member Grade.
- Dr. Sonia Dhiman (Professor, Chitkara College of Pharmacy) received the Young Scientist Award from the ITS, Haridwar & IPGA, Uttarakhand State Branch.
- Dr. Neeraj Anand (Professor, Chitkara Business School) received the Certificate of Recognition from the Indian School of Business, Career Advancement Services, Hyderabad.
- Dr. Amandeep Kaur (Professor, CSE) received the Nobel Laureate Dr CV Raman National Science Day Award 2023 from the Art of Giving Charitable Trust India.
- Dr. Sarita Jangra (Associate Professor, Chitkara College of Pharmacy) received the Patient Care Provider Award from the Kiteskraft Productions.
- Dr. Monika Gupta (Associate Professor, Chitkara Business School) was recognized as the Best Senior Faculty by the Novel Research Academy, Puducherry.
- Dr. Devesh Bathla (Associate Professor, Chitkara Business School) was recognized as the Most Prominent Analytics and Data Science Academician by the AIM- Analytics India Magazine. He also received the Young Management Teacher Award from the AIMS International, The Association of Indian Management.
- Dr. Chinky Jaggi (Associate Professor, Department of Applied Sciences) received the ISTE Section Best Teacher Award from the Indian Society for Technical Education.
- Dr. Amandeep Kaur (Assistant Professor, Mechatronics) won the Young Achiever Award from the G.B. Pant University of Agriculture and Technology, Pantnagar.
- Anjali Xess (Assistant Professor, Chitkara School of Hospitality) received a Certificate of Recognition from the Nirgia Brand Promoters.

- Dr. Nayan Gupta (Assistant Professor, Chitkara School of Health Sciences) has been recognised as a Fellow by the American Academy of Optometry, USA.
- The artwork titled “Andhera” by B. Ajay Sharma (Assistant Professor, Chitkara School of Art and Design) was awarded by the Chandigarh Lalit Kala Akademi.
- Dr. Ajay Dogra (Assistant Professor, Chitkara Business School) received the National Award for Outstanding Teacher Award 2022-23 from the International Institute of organized Research (I20R).
- Dr. Anuj Kumar Jain (Assistant Professor, CSE) has been recognised as the Best Academician 2022 by the Science, Technology, Engineering and Management - Research Society (STEM-RS).

4-Star Rating for the Institution's Innovation Council (IIC) of Chitkara University

Institution's Innovation Councils (IICs) have been set-up by the Ministry of Education Innovation Cell in the Higher Education Institutions (HEIs) across the country to promote the culture of innovation in HEIs. The IIC at Chitkara University being driven by CURIN has been doing an excellent job since its inception. In the IIC calendar year 2022-23, our IIC received an incredible 4-star rating. There are only 142 HEIs in the country that have received 4-star rating out of the 3428 participating institutions. Under the guidance of Dr. Archana Mantri – VC, Chitkara University, Punjab, our IIC has been led by a competent team from CURIN, including Dr. Manish Sharma (Director, Research), Dr. Rakesh Goyal (Professor), Dr. Garima Chopra, Dr. Sushma and Dr. Kulbhushan Sharma – Assistant Professors. Additionally, each department of the university has appointed one IIC Innovation Ambassador making it a large group, which is driving a formidable culture of innovation in the university. During the 8th Annual Excellence Awards, the entire group of IIC was felicitated for this remarkable achievement.

600 Papers Across Disciplines in Chitkara University Doctoral Consortium (CUDC) 2023

Keynote Talks | Paper Presentations | Expert Talks | Meet the Editors Series | Painting Consortium

The Chitkara University Doctoral Consortium (CUDC) 2023 held on November 3 and 4, 2023 was a much-anticipated event that exceeded its expectations. Following the opening remarks by our Hon'ble Pro-Chancellor of Chitkara University, Dr. Madhu Chitkara and Vice-Chancellor of Chitkara University, Punjab, Dr. Archana Mantri, Dr. V.V. Ram - Managing Director and CEO of Seedworks International Pvt. Ltd. and a Chitkara University alumnus, set the tone by highlighting the crucial link between academia and industry in the PhD journey. With a total of 600 papers spread across various tracks in Management, Engineering and Technology, Applied Sciences, Media Studies, Education, Pharmaceutical Sciences, Health Sciences, Nursing, Architecture, and Art & Design, the Consortium showcased the depth and breadth of research.

Meet the Editor series, featuring renowned editors, Dr. Arpan K Kar (Professor, Indian Institute of Technology, New Delhi), Dr. Charbel Sallom (EM Normandie Business School, France) and Dr. Parmod Singh (Professor, CSE, IITM Gwalior, Madhya Pradesh) provided valuable insights into manuscript development and review procedures.

Dr. Yashveer Singh (Associate Professor, Department of Biomedical Engineering, IIT, Ropar, Punjab) offered in-depth insights into the transformative potential of hydrogels in drug delivery and wound healing applications. Guest speakers, Mr. Bhavdeep Singh (Founding Partner, WHA Partners & Whitehawk Associates LLC, New York, USA & Former CEO Fortis Health Care Ltd.) and Dr. S. Senthil Kumar (Professor, School of Health Sciences, Department of Physiotherapy Garden City University Bangalore, Karnataka, India) focused on research and innovations in healthcare. The experts talks were delivered by Dr. Ashutosh Biswal - Professor and Dean, Maharaja Sayajirao University, Baroda and Mr. Graham Burns - JAMK University of Applied Science, Finland, which helped in sharing the intricacies of research. Day 1 was marked by 304 impressive paper presentations, complemented by expert sessions that facilitated networking and knowledge sharing.

The highlight of Day 2 of CUDC 2023 was the Meet the Editor series where in Dr. Md. Mamum Habib (School of Business and Entrepreneurship, Independent University, Bangladesh) and Prof. Dr. Ranjith Dayaratne (Asian School of Architecture, Melbourne, Australia) shared invaluable insights into the publication procedures and research writing skills, enriching the experience of consortium attendees. Day 2 was packed with a remarkable lineup of expert sessions and intellectual deliberations. Distinguished speakers included Dr. Seema Banerjee (John Hopkins School of Medicine, Maryland, USA), Dr. Daniel K Wilson (President Emeritus & University Professor Western University of Health Sciences Pomona, California USA), Dr. Jean-Michel Brismée, Professor (Texas Tech University Health Sciences Center, Texas, USA) and Dr. Gurbir Singh (MD, Professor Emeritus, CSHS), Dr. Ravi Shankar Srinivasan (Professor & Director, Graduate Programs & Research, M.E. Rinker Sr. School of Construction Management, University of Florida, USA), Dr. Vijay Babbar (Canadian Nuclear Laboratories, Ontario, Canada), and Dr. Rozalina Zakaria (Photonics Research Centre, Faculty of Science, Universiti Malaya, Malaysia). Additionally, enriching presentations were also delivered in technical sessions by conference attendees in nine track areas on Day 2 as well.

Simultaneously, a four-day International Painting Consortium, entitled Visual Creation and Practical Notion was organized by Chitkara Design School that concluded on Day 2 of CUDC 2023.

CUDC 2023 culminated with immense enthusiasm and a vote of thanks in each track acknowledging the efforts of all stakeholders, a rigorous exchange of ideas, and abundant networking opportunities cementing its status as a pivotal knowledge-sharing platform and as a unique initiative by Chitkara University. CUDC has been spearheaded by Dr. Amit Mittal - Pro VC (Research Programs), Chitkara University, Punjab and Dr. Pankaj Kumar – Pro VC (Research), Chitkara University, Punjab, who are the Consortium Directors. They were ably supported by a team of conveners who are also seasoned researchers at Chitkara University, including Dr. Arun Aggarwal, Dr. Arun Upmanyu, Dr. Anju Goyal, Dr. Deepali Gupta, Dr. Deepam Goyal, Dr. Sridhar Manohar, and Dr. Urvashi Tandon.

Activities of Doctoral Research Centre (DRC), Chitkara Business School (CBS) in Q4 2023

Two-day Workshop on Qualitative Research and Data Analysis using NVIVO Software (October 21-22)

The workshop was conceptualised with the intention of knowledge building on the fundamentals of qualitative research concepts, methodologies and processes in addition to providing hands-on training on NVIVO software. The resource person was Dr. Magiswary Dorasamy – Chairperson, Centre of Excellence for Knowledge and Innovation Management (CEKIM), and Associate Professor, Faculty of Management, Multimedia University, Cyberjaya Campus, Malaysia. This workshop was attended by 75 research scholars and faculty members of Chitkara University.

One-day Seminar on Technicalities of Questionnaire Design (November 23)

This one-day seminar was delivered by Dr. Seema – Visiting Faculty, DRC, CBS, and it was attended by 35 research scholars and faculty members who were provided valuable insights into crafting effective surveys. Dr. Seema discussed several types of scales and provided inputs on testing the reliability and validity of questionnaires. Emphasis was placed on formulating clear, unbiased, and unambiguous questions to elicit accurate responses. The importance of pilot testing and refining survey instruments to ensure comprehensibility and relevance was also discussed in the seminar. Additionally, discussions delved into the best practices for structuring questionnaires, selecting appropriate response formats, and minimizing respondent bias.

Five-day Workshop on Bibliometric Analysis (November 28 – December 2)

A five-day workshop on Bibliometric Analysis was organized in collaboration with the Office of the Research Publication, Chitkara University, Punjab, wherein the key resource persons were Dr. Meenal Arora (Visiting Faculty, DRC, CBS), Dr. Arun Aggarwal (Assistant Professor, DRC, CBS), and Dr. Vinay Kukreja (Professor, CURIN). 30 research scholars and faculty members of Chitkara University, Punjab attended the workshop that underscores the use of bibliometric tools to assess academic productivity and identify emerging trends in various fields. Through hands-on sessions, attendees acquired practical knowledge of tools like Scopus and Web of Science, enabling them to navigate and interpret bibliographic data effectively. Participants received knowledge about the various themes and sub-themes like co-occurrence analysis, co-citation analysis, bibliometric coupling, etc.

Individual Contributions and Achievements of Faculty Members of DRC, CBS

- Dr. Amit Mittal, Pro-VC (Research Programs) delivered a keynote address titled Business Failure and Success: Proposing a Theoretical Framework at the International Conference of Digital Business, Society and Economy 2023, which was held at the prestigious Asia Pacific University of Technology & Innovation, Kuala Lumpur, Malaysia during October 24-25. Dr. Mittal along with his co-authors, Dr. Sridhar Manohar (Assistant Professor, DRC, CBS) and Arjun Nair (Research Scholar, CBS) also received the best paper award for their contributions to the conference through their paper titled, AI enabled Fintech for Innovative Sustainability.

  Dr. Mittal was invited as a special guest at Neville Wadia Institute of Management Studies and Research, Pune, on November 25, for the inaugural ceremony of their PhD coursework on Research Methodology for the scholars of University of Pune.

  Dr. Amit Mittal was invited to participate in the 1st Asia - Middle East - Africa Conference on Academic and Research Integrity (ACARI 2023) that was held at Middlesex University, Dubai during December 17-19. He was one of the panellists in the panel discussion on the topic Global Education, Local Values, which delved into the significance of maintaining academic integrity within the context of an increasingly interconnected world, emphasizing the need to navigate the challenges posed by globalization while preserving the essence of local values and cultures.

- Dr. Arun Aggarwal (Assistant Professor, DRC) and Ishani Sharma (Research Scholar, DRC) received the best paper award in one of the paper presentations sessions of CUDC 2023.
- Dr. Sridhar Manohar (Assistant Professor, DRC) and Kirti Toulani (Research Scholar, DRC) received the best paper in one of the paper presentations sessions of CUDC 2023. Dr. Sridhar was also the resource person in two different workshops conducted by VELTECH University, Chennai and GNA University, Phagwara, Punjab.

International Symposium on Interventions and Innovations for Diabetes Management (IIDM 2023)

In collaboration with the DST funded Chitkara University Technology Enabling Centre (CU-TEC)

Chitkara School of Health Sciences (CSHS), CURIN and CU-TEC, in association with the World NCD Federation (WNF) and Doctors For You (DFY), jointly organized the International Symposium on Interventions and Innovations for Diabetes Management (IIDM 2023) on November 30, 2023, to promote industry-academia collaborations for the advancement of diabetes management technologies.

Under the guidance of Dr. Archana Mantri – VC, Chitkara University, Punjab, IIDM 2023 brought all stakeholders working in the domains of diabetes care, technology, and management to a common platform to deliberate upon the existing situation, challenges, and opportunities in diabetes management through technology interventions.

The symposium thoroughly explored the current and future landscape of diabetes technology, partnerships, efficient industry-academia collaborations, and bridging healthcare gaps. Distinguished experts, including Dr. Ronika Paika (World NCD Federation), Dr. KP Singh (Director, Department of Endocrinology, Fortis Hospital, Mohali), Dr. Amit Lahoti (Associate Professor of Pediatrics and Program Director - Pediatric Endocrinology Fellowship Program, Nationwide Children's Hospital, Ohio State University), Dr. Anurag Mishra (Professor, Maulana Azad Medical College, New Delhi), Dr. Rajat Jain (Radiologist and President of Doctors For You, New Delhi), Dr. Sanjay Rajpal (Country Manager, Ypsomed India Pvt. Ltd., New Delhi)

and Mr. Sanket Kumar Biswas (Vice President of Technology, BeatO, New Delhi) delivered enlightening sessions, providing a holistic view of diabetes care.

The key deliberations in the summit were on addressing the diabetes epidemic and public health challenges, understanding the scope of diabetes problem in India and current situation, latest developments, and unmet needs in diabetes management, creating affordable and innovative diabetes technology and the role of civil society. The impact of technology digitization on diabetes management and tech-driven diabetes wellness from the industry perspective were also touched upon in IIDM 2023.

The event also featured a panel discussion on the topic Emerging Trends in Diabetes Care: Opportunities and Challenges. The panellists were Dr. Vijayendra Bhalla (Principal Scientist, IMTECH, Chandigarh), Dr. Rakesh Kumar (Professor, Paediatric Endocrinology & Diabetes Unit, Advanced Paediatrics Centre, PGIMER, Chandigarh), Dr. Amit Lahoti and Mr. Sanket Kumar Biswas. The panel was moderated by Dr. Sagar Juneja – Associate Director (Research), CURIN.

IIDM 2023 was attended by close to 100 delegates comprising of academicians, researchers, and students from different institutions as well as representatives from industries and start-ups. The core team that conceptualized and executed this event included Dr. Archana Mantri – VC, Chitkara University, Punjab, Dr. Sonika Bakshi Bhandari (Dean, Chitkara School of Health Sciences (CSHS)), Dr. Satyam Kumar Agrawal (Professor, CURIN), Dr. Navita Gupta (Associate Professor, CSHS), Dr. Pooja Dogra (Assistant Professor, CSHS), Dr. Varsha Singh (Assistant Professor, CURIN), and Dr. Sagar Juneja (Associate Director, Research, CURIN).

Research@CURIN

Top Research Papers of the Quarter by CURIN (Published during October – December 2023)

Faculty members and research scholars from CURIN 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 attempt to discuss them in the form of short summaries.

The research papers discussed in this issue are the ones that were published during October – December 2023. The complete list of publications by CURIN faculty members and scholars during this period is available in a separate section.

A study on molecular interaction of mixture of maltitol and 2-BE/ 2-PhE to benefit the pharma and healthcare industries

By: Dr. Arun Upmanyu - Professor, CURIN

This article is based on the research paper titled 'Thermodynamic and Physicochemical Characteristics of 2-Butoxyethanol/ 2-Phenoxyethanol in Aqueous Maltitol Solutions' published by Dr. Arun Upmanyu, from CURIN, Chitkara University, Punjab in Elsevier journal entitled Journal of Molecular Liquids.

The study of molecular interactions is important in every field of science viz., chemistry, biochemistry, and biophysics, including protein folding, drug design, material science, sensors, nanotechnology, separations, and the origin of life. These interactions provide valuable information for understanding molecular packing and affect the arrangement, orientation, and conformations of the molecules. The molecular interactions in the system are controlled by the type of bond and bond strength between the molecules. The strength of bonds represents the type of molecular interaction present in the system. The study of thermo-physical properties such as speed of sound, density, refractive index, and viscosity with respect to concentration and temperature is the most comprehensive method to investigate molecular interactions prevalent in these systems. Nowadays, spectroscopic techniques such as FTIR, NMR, and UV-vis are being used to explore the molecular interactions in mixtures.

The major focus of this research is to predict the important physical and chemical properties such as density, ultrasonic velocity in the three component mixtures, commonly known as ternary mixtures, of maltitol, 2-phenoxyethanol (2-PhE) and 2-butoxyethanol (2-BE) at different concentration and temperatures under atmospheric pressure. Maltitol is a sweetener with a low glycemic index, and it is used in the food industry as well as the pharma industry. 2-PhE is used in chemical synthesis, dyes as well as in preservatives. 2-BE has strong antibacterial effect that prevents fungal and bacterial growth. Based on the existing literature, the authors of this work found that the investigation of the molecular interactions of mixture of maltitol and 2-BE/ 2-PhE using thermo-physical properties was not reported. The predicted parameters in this work are utilized to explore the thermo-physical and chemical behavior of the given mixtures in terms of molecular interactions prevalent in these systems. The outcomes of this study will provide valuable information for pharmacy, healthcare, and chemical products.

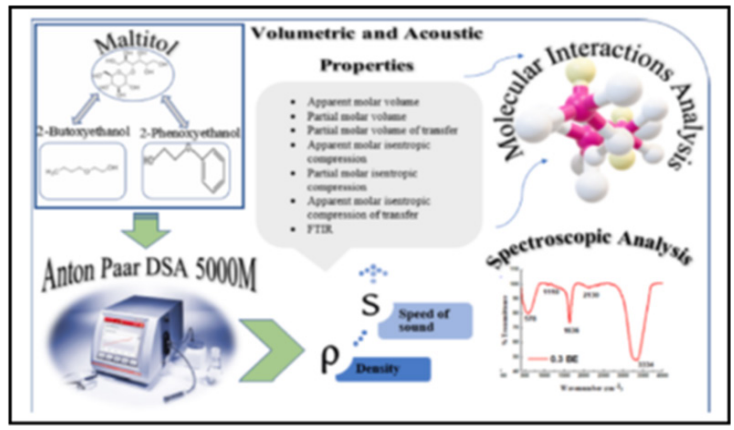


Illustration is borrowed from the published paper

An empirical study of key predictors of online shopping

By: Dr. Urvashi Tandon – Associate Professor, DRC, CBS

This article is based on the research paper titled 'Modelling Gamification, Virtual-try-on Technology, and E-logistics Service Quality as Predictors of Online Shopping: An Empirical Investigation' published by Dr. Urvashi Tandon in the Springer Nature journal entitled Current Psychology.

A massive change has been noticed in the attitude and behavior of consumers with respect to online shopping due to the penetration of the internet. This increasing trend is visible in both developing and developed nations. E-retailers employ a variety of interactive tools and policies, such as shipping alternatives, prompt delivery, error-free orders, rewards and bonus points, pay-on-delivery (POD) mode of payment, 3D virtual try-on (VTO), and generous return policies, to achieve competitive excellence and encourage current customers. These innovative strategies influence consumer behavior by encouraging consumers to make an online purchase. E-retailers may attain a competitive advantage by focusing on these strategies.

This research has extensive and multifaceted implications for academicians, practitioners, and society as well. Initially, it establishes theoretical linkages among E-Logistics Service Quality (e-LSQ), VTO, and customer satisfaction. This research also establishes the conceptual relationship between gamification and customer satisfaction along with POD, much common in developing countries. Finally, by expanding self-determination theory (SDT), this study advances our knowledge of the intrinsic and extrinsic motivators driving online purchase.

This research provides empirical validation for e-LSQ, gamification, and VTO in a single study, thus underlining the relevance and significance of each construct in presence of others. The positive relationship between VTO and customer satisfaction indicates its role in building a positive attitude, which in turn enhances customer satisfaction. By deploying this option in websites, e-retailers may create a desire to make a purchase. Consequently, VTO plug-ins and extensions may be introduced especially by those e-retailers selling lifestyle-related products. However, assurance with respect to security must be provided on the websites of e-retailers. This is particularly crucial since customers may not be able to use the add-ons due to certain cultural or religious restrictions. For instance, in certain communities and religions, women (or even men) may feel inconvenient in using a plug-in that takes the images or videos of their body parts. Hence, appropriate, and transparent guidelines on the privacy and security of personal information need to be dealt with.

The significant contribution of this research lies in validating POD mode of payment in the realm of SDT framework. POD strengthens the relationship between customer satisfaction and repurchase intention. Additionally, online shoppers may have affirmative and positive communication while receiving the product which fulfills their desire of "Relatedness." Consequently, because clients pay only after getting the item, the POD way of payment reduces the possibility of obtaining defective products. Once satisfied with the performance of the product and logistics, the online shoppers may revisit the site and make additional purchases. This is in fact an exclusive contribution of this research for e-retailers as well as for researchers focusing on online shopping. Online retailers may create operational marketing strategies that coherently articulate the significance of various customer satisfaction and repurchase intention variables, arranged in order of significance: e-LSQ (comprising a reverse logistics applet), POD, and VTO technology.

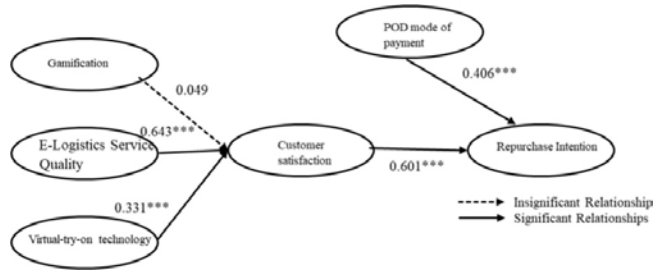


Illustration is borrowed from the published paper

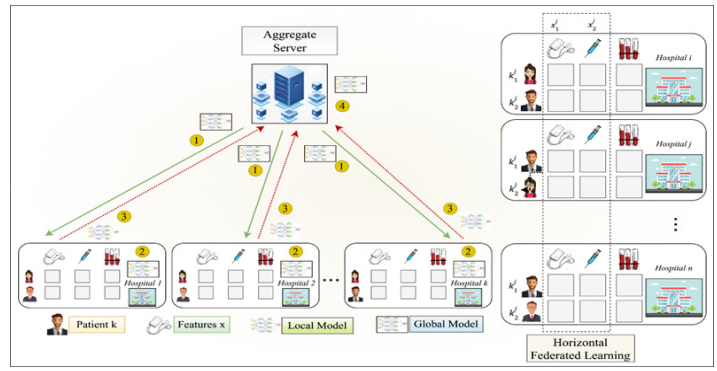
Assessing the effectiveness of disease detection models trained with federated learning

By: Dr. Kalpna Guleria - Professor, CURIN

This article is based on the research paper titled 'A Comprehensive Review on Federated Learning Based Models for Healthcare Applications' published by Shagun Sharma, and Dr. Kalpna Guleria from CURIN, Chitkara University, Punjab in an Elsevier journal entitled Artificial Intelligence in Medicine.

The early identification of diseases is crucial to effective treatment and prevention of complications. Deep learning has been identified as an effective technique in medical research due to its accurate and reliable prediction of early disease. These models are used in the medical industries to support diagnosis capabilities by healthcare practitioners. However, a major barrier originates in the lack of large-scale datasets because of privacy issues. The health care organizations

do not share the patient's information due to strict rules and regulations of HIPAA. Federated learning ensures patient's data privacy. This learning framework also ensures that each patient's data is protected during collaborative model training. This work aims to categorize disease detection models based on architectural characteristics of federated learning. It offers a detailed examination of model hyperparameter settings and architectural attributes, assessing the suitability of federated learning for classifying different diseases in the healthcare domain.



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This review thoroughly analyzes the federated learning methodology, exploring its categories, the associated data distribution, and the reasons behind their usage. The article assesses the effectiveness of disease detection models trained with federated learning, delving into a detailed discussion and illustration of performance parameters used in model construction to evaluate their efficacy. The meta-analysis of the existing models trained through federated learning is discussed, encompassing aggregation techniques, types of federated learning, source code availability, augmentation methods, and more. This contributes to enhancing the clarity of the article selection process for future research in this domain. The work presented also underscores diverse research challenges linked to models trained through federated learning approaches. It introduces a fresh perspective on existing work by outlining future directions aimed at enhancing research outcomes.

Figure illustrates the horizontal federated learning (HFL) framework of a disease detection model. Within the framework of HFL, individual clients possess distinct local datasets, encompassing identical feature spaces yet varying instances, as depicted in figure 1. This approach is employed in situations where there exists a finite set of variations in sample sizes. HFL comprises varying nodes, such as health institutes, hospitals, and health wearable devices.

Highly accurate predictive technique for enhancing accuracy in brain stroke detection

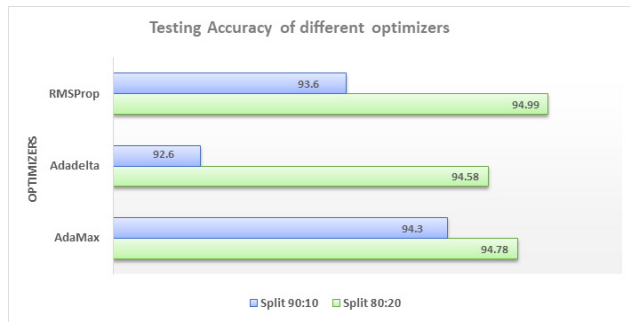
By: Dr. Mudita Uppal - Assistant Professor, CURIN

This article is based on the research paper titled 'Enhancing Accuracy in Brain Stroke Detection: Multi-layer Perceptron with Adadelta, RMSProp and AdaMax Optimizers' published by Dr. Mudita Uppal and Dr. Deepali Gupta from CURIN, Chitkara University, Punjab in journal entitled Frontiers in Bioengineering and Biotechnology.

The human brain, an intricate organ composed of the cerebrum, cerebellum, and brainstem, is shielded by the skull. A stroke, a potentially fatal condition, arises from unfavorable artery obstructions, emphasizing the need for early diagnosis to mitigate severity and mortality rates. This paper addresses the critical issue of brain stroke detection, proposing a highly accurate predictive technique.

The proposed model leverages a Multi-Layer Perceptron (MLP) as a classification method for stroke data. What sets this research apart is the incorporation of multiple optimizers, including AdaMax, RMSProp, and Adadelta. The experiment's standout performer is the RMSProp optimizer, achieving an impressive training accuracy of 95.8% and a testing accuracy of 94.9%. This novel approach of combining various optimizers with the MLP classifier enhances the robustness and accuracy of stroke prediction.

The practical implications of this research are profound. Improved accuracy in stroke detection translates to enhanced actions, treatment approaches, and reduced misdiagnosis. It positively influences patient outcomes, minimizes disability, and reduces mortality rates. The efficiency in healthcare resource allocation is heightened, and it fosters advancements in telemedicine and stroke care research.



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The primary goal of the proposed model is to elevate the standard of stroke diagnosis, enabling quick and reliable identification for timely treatment. The study delves into the performance evaluation of the MLP algorithm with different optimizers. RMSProp emerges as the top performer, boasting a remarkable accuracy of 94.98% on an 80–20 split and a learning rate of 0.01. AdaMax exhibits

promise with a 90–10 split, a learning rate of 0.01, and minimal loss. These results underscore the methodology's effectiveness in enhancing brain stroke detection accuracy.

In conclusion, this research is a significant step towards addressing the pressing issue of brain stroke detection. The integration of innovative approaches, such as combining multiple optimizers with the MLP classifier, demonstrates the potential for substantial advancements in medical diagnosis and treatment. As the field evolves, the incorporation of diverse data sources and the exploration of ensemble models will likely contribute to even greater strides in improving stroke detection accuracy. The data used in this work is solely textual, but gathering a dataset of CT scans to forecast the chance of stroke can be more effective in the upcoming future. The strengths of diverse ML and DL techniques can be combined to construct an ensemble model that could lead to better predictive capabilities.

Using machine learning for assessing the performance of perovskite solar cell under varying transport layer parameters

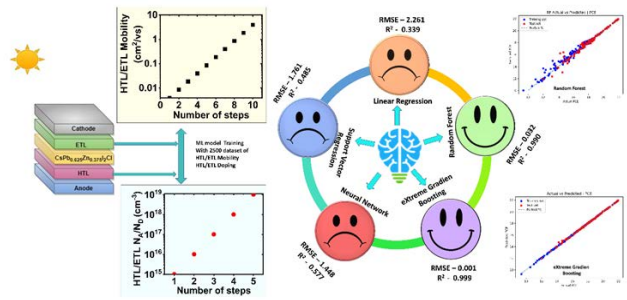
By: Dr. Jaya Madan - Assistant Professor, CURIN

This article is based on the research paper titled 'Machine Learning-Aided Optimization for Transport Layer Parameters of Low Lead Inorganic Zn-Based Mixed-Halide Perovskite Solar Cell' published by Navdeep Kaur, Dr. Rahul Pandey, and Dr. Jaya Madan, from CURIN, Chitkara University, Punjab in Elsevier journal entitled Solar Energy.

Renewable energy sources are sustainable and environmentally friendly alternatives to traditional fossil fuels. Solar energy holds significant importance as a renewable energy resource due to a variety of environmental, economic, and social benefits. Silicon solar cells remain a dominant force in the solar energy market, providing a reliable and established solution for harnessing sunlight and converting it into clean, renewable electricity. Presently, silicon based photovoltaic (PV) devices command over 95% of the PV market, primarily owing to their wide availability and well-established manufacturing processes. However, challenges persist in terms of production costs and efficiency. Perovskite materials have emerged as a promising substitute for silicon in the design of photovoltaic cells. The remarkable performance of thin film perovskite solar cells, characterized by low production costs, a high absorption coefficient, substantial power conversion efficiency, and an adjustable bandgap, has made them stand out. Nonetheless, hybrid perovskite solar cells face a challenge in terms of low thermal stability. In contrast, inorganic perovskite solar cells exhibit exceptional stability in their performance. Through this article, a research team in VLSI Centre of Excellence, Chitkara University, Rajpura, Punjab, India, comprising of Navdeep Kaur, Dr. Rahul Pandey and Dr. Jaya Madan have proposed all inorganic, low lead, cesium-based perovskite solar cells.

In this study, the photovoltaic (PV) performance of a layered all inorganic perovskite solar cell, TiO2/ CsPb0.625Zn0.375I2Cl/Spiro-MeOTAD, assessed under varying electron transport layer (ETL) and hole transport layer (HTL) mobility and doping density, with the use of simulator. This exploration resulted in the generation of a dataset comprising 2500 PV performance entries, including parameters such as current density (JSC), fill factor (FF), open-circuit voltage (VOC), and power conversion efficiency (PCE). These attributes from the dataset have been utilized to train machine learning models, namely linear regression (LR), random forest (RF), support vector regression (SVR), eXtreme gradient boosting (xGB), and artificial neural network (ANN). Execution of ML algorithms revealed that performance of RF and xGB exhibits high correlation with simulator generated data set as the prediction made by these two algorithms are best matched to the actual outcome. A significant rise in PCE is observed from 9.5% to 21.90% while optimizing ETL/HTL mobility and doping density.

In the subsequent section, a SHAP analysis is conducted to gain insights into the significance of individual parameters, such as the mobility and doping density of the ETL and HTL, on the photovoltaic performance. This analysis aims to provide a comprehensive understanding of how variations in these specific parameters influence the overall performance of the solar cell, shedding light on the key factors impacting its efficiency. The findings from this investigation offer guidance to researchers involved in designing highly stable perovskite solar cells. Incorporating machine learning into the design and performance prediction of all inorganic solar cells proves to be a time-efficient approach.



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Accomplishments of CURIN Faculty Members and Scholars

Awards, Recognition, International Exposure, etc.

- Dr. Amit Mittal - Pro-VC (Research Programs), received the prestigious Career 360 Faculty Research Award for the Most Outstanding Researcher in the field of Business, Management and Accounting in the country. He received this award from the Hon'ble Shri Rajeev Chandrasekhar - Union Minister of State for Skill Development & Entrepreneurship and Communication & IT, at the award ceremony held in New Delhi on October 6, 2023.

- Dr. Vandna Sharma – Assistant Professor, CURIN, who completed her PhD under the guidance of Dr. Pankaj Kumar – Pro-VC (Research), CURIN, has completed her Post-Doctoral Fellowship from August 2022 to November 2023 as a Scientific Associate in the distinguished European Research Council (ERC) Project, LOGOS at the Jozef Stefan Institute in Ljubljana, Slovenia (Europe). Working in collaboration with the eminent researchers, Prof. Igor Musevič and Prof. Slobodan Žumer of the Jozef Stefan Institute, Dr. Vandna has added a new chapter to her academic journey by delving into cutting-edge research within the realm of the ERC Project LOGOS. Dr. Vandana was also invited by the Ambassador of India, Ms. Namrata S. Kumar at India House in Ljubljana, Slovenia, on the occasions of Republic Day and Independence Day.

- Dr. Arun Upmanyu - Professor, CURIN, has received the Dr. S. Parthasarthy Memorial Award from the Ultrasonic Society of India (established in 1974). He received this award for his research paper titled Estimation of Effective Debye Temperature of Polymeric Solutions at 303.15 K based on Quasi Crystalline Model, which

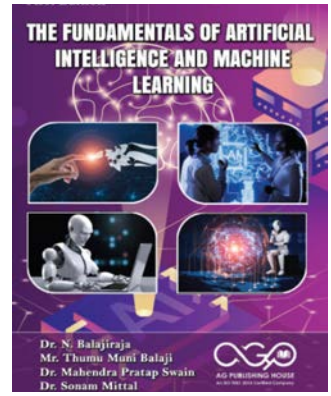
was published in the Journal of Pure and Applied Ultrasonics in volume 44 in the year 2022. The award certificate was presented to him by the President of the Ultrasonic Society of India (USI) in the esteemed presence of Prof. Mukhesh Pandey - Vice Chancellor, Bundelkhand University, Jhansi, Uttar Pradesh, India, in the inaugural function of the International Conference on Ultrasonics and Materials Science for Advanced Technology that was held in Bundelkhand University during November 25-27, 2023.

- Dr. Ayush Dogra – Assistant Director (Research), CURIN, received the Young Scientist and Best Researcher Award for his remarkable contributions to Low Dose Cardiac Imaging at the 2nd World Congress on Non-Communicable Diseases-2023 held on October 29, 2023, at IISc Bangalore. Furthermore, he has been appointed as a member of esteemed societies dedicated to advancing the field of imaging. Notably, he is a member of the International Contrast Ultrasound Society (ICUS) in Chicago, the Green ThinkerZ Society, GIRES, Amsterdam and the Soft Computing Research Society (SCRS). These societies cover a wide range of disciplines, including Artificial Intelligence, Bioinformatics, Computer Science, Data Mining, Electrical Engineering, Imaging Engineering, Industrial Engineering, Information System Engineering, Scientific Computing and Software Engineering. Dr. Ayush Dogra has been performing the role of Guest Editor for a Special Thematic Issue of the Journal, Current Medical Imaging which is slated for submission in February 2024.

Dr. Dogra is associated with several international conferences in different capacities including Program Committee Member, Technical Program Committee Member, Reviewer, etc. These conferences include, 3rd International Conference on Intelligent Vision and Computing (ICIVC-2023), 4th International Conference on Computational Intelligence (ICCI-2023), 23rd Intelligent Systems Design and Applications Conference (ISDA'23), 5th International Conference on Sustainable and Innovative Solutions for Current Challenges in Engineering and Technology (ICSISCET 2023), Congress on Smart Computing Technologies (CSCT-2023), 2nd International Conference on Data, Decisions, and Systems Conference'23 (ICDDS-23), International Conference on Advances in Artificial Intelligence and Applications (AAIA-2023), International Conference on Image Enhancement and Computer Vision (ICIECV-2024) International Conference on Optoelectronics Information and Optical Engineering (OIOE-2024), International Conference on Intelligent Traffic and Transportation (ICITT-2024), and 2nd International Conference on Intelligent Perception and Computer Vision (CIPCV-2024), International Conference on Bioengineering and Computer Aided Systems (BCAS-2024), 3rd International Conference on Life, Health, and Modern Medicine (LHMM-2024), and International Congress on Optics, Electronics, and Optoelectronics (ICOEO-2024). Dr. Dogra also conducted a Special Session on Advancements and Applications in Machine Learning and Image Processing for Intelligent Systems during ISDA 2023 on December 11-13, 2023. This session was organized by MIR Labs, USA.

- Dr. Leema Nelson – Assistant Professor, CURIN, has achieved a significant milestone by successfully completing the prestigious DAAD DIES ProGRANT course in November 2023. Organized by the University of Cologne, Germany, it was a seven-month practical-oriented training program for young researchers in India, and Dr. Nelson was one of the top 100 doctorates from across the country who were selected for the program. Aimed at developing the skills of grant proposal writing, this extensive course featured a self-study segment, proposal development segment, and chat sessions with experts and fellow participants. The training program culminated with an on-site seminar that was held at The Lalit, New Delhi during November 20-24, 2023. As one of the finalists, who completed all segments of the program, Dr. Nelson successfully defended a grant proposal through a compelling presentation in front of the esteemed ProGRANT team. Notably, Dr. Nelson was the only participant from whole of North India in this prestigious program, which makes her achievement even more significant.

- Dr. Sonam Mittal – Assistant Professor, CURIN, co-authored an insightful book titled, Fundamentals of Artificial Intelligence (AI) and Machine Learning (ML), which has been published by AG Publishing House, India. She presented a comprehensive guide unraveling the complexities of AI and ML. This work dives into the core principles, applications, and advancements in these transformative technologies. From foundational concepts to real-world implementations, the book serves as a go-to resource for both beginners and seasoned enthusiasts. By distilling intricate topics into accessible insights, it empowers readers to navigate the rapidly evolving landscape of AI and ML, fostering a deeper understanding of their impact across diverse industries.



- Shusmita Jain - JRF, Centre for in-vitro Studies and Translational Research (CVSTR), CURIN, pursuing her Ph.D. under the guidance of Dr. Satyam Kumar Agarwal, Professor (Research), and Head, CVSTR, was one among the fifty fortunate individuals, comprising of Ph.D. students, MDs, postdoctoral associates, shortlisted for attending the Immuno-India 2023, over six illuminating days from October 1-6, 2023.

  Academically, the IUIS-FIMSA-IIS Immuno-India 2023 course shone a light on the complex interplay between epigenetic

control and immunological responses. The course explored the basic mechanisms of epigenetic regulation and its significant effect on the immune system. From a clinical standpoint, attendees discussed autoimmune diseases, cancer, and infections. To help students better grasp these complex mechanisms, lectures were supplemented by hands-on exhibits of state-of-the-art technology used in epigenetic research.

- Chitkara University, Punjab, had the privilege of hosting an extended and enlightening CBSE Exposure Visit in collaboration with the Central Board of Secondary Education (CBSE) for the principals and educational leaders of schools during October 3-4, 2023. The Immersive and Interactive Technologies Lab (IITL) of CURIN was invited to showcase their AR based educational projects that are aligned with CBSE school syllabus in this event.

- In the Chitkara University Doctoral Consortium (CUDC) 2023 that was held during November 3-4, 2023, several researchers and PhD scholars from CURIN won Best Paper Award in a Track.

  Monica Dutta and Dr. Deepali Gupta won for their paper titled, A Comparative Analysis of Hydroponics and Soil Cultivation: Advancements in The Field of Sustainable Vertical Farming.

  Priyanka and Dr. Amanpreet Kaur won for their paper titled, Analyzing the Efficiency of Pathfinding Algorithms for Digital Games.

  Taniya and Dr. K.R. Ramkumar for paper titled, Newton Raphson Method for Root Convergence of Higher Degree Polynomials using Big Number Libraries, which was also authored by Dr. Sudesh Mittal and Dr. Amanpreet Kaur.

  Harish Kumar, Dr. Naveen Kumar, and Dr. Rajesh Kaushal for their paper titled, Issues with Existing Solutions for Grievance Redressal Systems and Mitigation Approach using Blockchain Network.

  Meenakshi and Dr. Pankaj Kumar for their paper titled, A Short Review on Effect of Quantum Dots on the Electro-optical and Morphological Behaviour of Polymer Dispersed Liquid Crystal.

  Shagun Sharma and Dr. Kalpna Guleria won the Best Paper Award in a Track in CUDC 2023 for their paper titled, Multiclass Lung Disease Classification with Ensembled CNN and LSTM Modeling.

  Amandeep Kaur and Dr. Kalpna Guleria won for their paper titled, Multiclass Classification of Rice Leaf Disease Detection using Transfer Learning.

  Swati Goel, Dr. Kalpna Guleria, and Dr. Surya Narayan Panda won the Best Paper Award in the 2nd International Conference on Applied Data Science and Smart Systems (ADSSS-2023) for their paper titled, Optimization Techniques for Wireless Body Area Network Routing Protocols: Analysis and Comparison.

Fostering International Collaboration

Visit to Azerbaijan in Pursuit of Strong and Meaningful Academic Collaborations

- The Azerbaijan State University of Economics (UNEC), Baku has attained the prestigious status of being the highest-ranked university in Azerbaijan. Notably, Dr. PK Khosla, Pro Vice-Chancellor, Research, Chitkara University, Punjab, participated in enriching discussions with the Rector - Prof. A.J. Muradov, and esteemed professors of UNEC on October 14. The central theme of these conversations was the cultivation of collaborative efforts in research initiatives and the mutual support necessary to elevate our global rankings. This strategic emphasis underscores our commitment to academic excellence, international partnerships, and the collective pursuit of advancing our global standing in the realm of education and research.

October 27, 2023, Chitkara University signed a MoU with Azerbaijan State University of Economics. Notably, both institutions hold prestigious rankings in the QS World University listings. This collaboration marks the initiation of a journey towards joint research initiatives and an enriched academic landscape. Illustrating this partnership's significance, Dr. P.K. Khosla of Chitkara University and Dr. Nazim Haziyev - Dean, UNEC, Baku, have co-authored a publication.

- Chitkara University's recent MoU with Baku Eurasian University (BAAU), Azerbaijan, marks a significant milestone fostering collaborative research and expanding our academic horizons. BAAU, established in 1992, is renowned for offering a diverse range of undergraduate, postgraduate, and Ph.D. programs. The formalization of this international partnership took place on November 2, 2023, in Baku, where Dr. PK Khosla, of Chitkara University, and Vice Rector of BAAU,

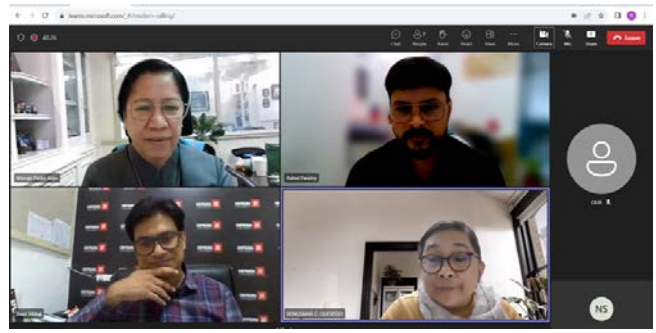
solidified the commitment to mutual growth and academic excellence. This collaboration signifies a broader global perspective for both institutions, paving the way for enhanced educational opportunities and research endeavors.

MoU between Chitkara University and Mindanao State University, Philippines

Research Collaboration Initiatives (RCI) team under the Office of Research Publications, CURIN, Chitkara University, Punjab, led by Dr. Amit Mittal – Pro-VC (Research Programs), Dr. Rahul Pandey – Assistant Director (Research), and Namita Sharma – Manager, Research Partnerships, initiated several research collaborations with different universities, some of which got materialized, while others are in the advanced stages of getting materialized. The details of all these collaboration initiatives are as follows.

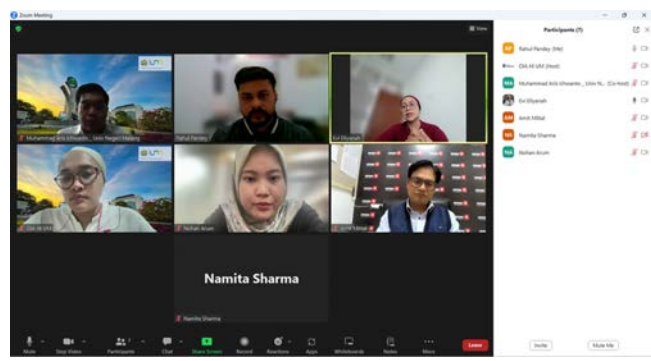
- Chitkara University and Mindanao State University, Philippines formalized their collaboration to enhance cooperation in the realms of research and academic pursuits through a MoU that was signed in October 2023, in the august presence of Dr. Madhu Chitkara – Pro-Chancellor, Chitkara University and Dr. Archana Mantri – Vice Chancellor, Chitkara University, Punjab. The aim of this collaboration is to facilitate joint efforts between the two universities in areas of research projects, teaching methodologies and student exchange initiatives. The agreement outlines various aspects of collaboration, including collaborative research initiatives, sharing of resources and promotion of staff and student exchange programs. The MoU covers the scope of collaborations, respective responsibilities of each party, allocation of intellectual property rights, confidentiality clauses, publication guidelines and conditions for termination. Additionally, the MoU includes a provision for establishing a collaborative research center at both universities.

- On October 3, RCI team held a meeting with the Adamson University, Philippines to explore the possible opportunities of collaboration. The team from Adamson University was comprised of Dr. Maruja Padre Juan, Dr. Venusmar C. Quevedo, and Dr. Noe. In the meeting, different models were proposed by both parties for the identification of faculty members sharing common interest in different research areas. Both universities underlined their consent for mutual benefit and growth in academic research.



- Chitkara University organizes Global Week every year wherein professors from leading universities from different parts of the world are invited to our university campus to teach our students for a week. In Global Week 2023, on October 16, the RCI team had an opportunity to interact with these invited professors. They explored the opportunities of collaborating with the professors of computer science & engineering and business management.

- On December 14, RCI team held a meeting with the Universitas Negeri Malang, Indonesia to discuss the research collaboration opportunities for both universities. The potential research areas for collaboration to mutually benefit both universities were discussed. This initial dialogue was promising and would unlock new frontiers in knowledge production and cross-cultural understanding. From Universitas Negeri Malang, Indonesia, the discussions were led by Dr. Evi Eliyanah - Director of Office of International Affairs.



STEM Projects Exhibition to Incline School Students toward Science & Technology Organized

As part of a two-year DST funded project on STEM Demonstration and Popularization

A very diverse and an inclusive STEM Projects Exhibition was organized by CURIN, Chitkara University, Punjab on December 6, 2023. Over 200 students and 30 teachers from 9 different schools in the region took part in the exhibition and showcased interesting science projects. Students from grade 7 to grade 12 took part in the exhibition that also witnessed a very good gender balance as well.

Chitkara University organized this 'STEM Projects Exhibition' to culminate a two-year government funded project on STEM Demonstration and Popularization. This funded project was sanctioned by the National Council for Science & Technology Communication (NCSTC) division of the Department of Science and Technology (DST) to Dr. Archana Mantri – VC, Chitkara University, Punjab and Dr. Sagar Juneja – Associate Director (Research), Chitkara University, Punjab, in 2021. The project aimed at promoting and popularizing Science, Technology, Engineering and Mathematics (STEM) education among students as well as encouraging and motivating young school students to enthusiastically take up STEM fields.

Under this funded project, a team from Chitkara University worked with 9 schools in the region and conducted different activities including seminars, tutorials, hands-on workshops, etc., in every participating school. As many as 19 resource persons, both from Chitkara University and outside, who are seasoned professionals and technocrats conducted these activities in schools. Through these activities more than 750 students were touched and motivated to

pursue STEM.

A felicitation ceremony was organized after the exhibition on December 6, wherein participating schools and resource persons were applauded. The invited guests of the ceremony were, Prof. (Dr.) Suman Beri - Executive Member, Governing Council, SPSTI, who is a veteran physicist, and Dr. Sarvjeet Herald - Director of Academics and Competitions, India STEM Foundation. Prof. Suman spoke about her work at the particle accelerator project at CERN and inspired students to pursue science. Dr. Herald shared how India STEM Foundation is actively working toward promoting STEM education. Dr. Archana Mantri highlighted how NEP2020 stressed upon the role of Higher Education Institutions in supporting school education and how Chitkara University is already doing some great work in this area. Dr. Sagar Juneja showcased the complete summary of the work done and outcomes achieved. He thanked all the schools as well as resource persons for making this project a success. He also thanked the NCSTC division of the DST for this opportunity.

Details of other activities under the same project organized in Q4, 2023

- A Science Exhibition was conducted by the Delhi Public School, Rajpura, on October 19. Students from grades 7 to 10 showcased working prototypes and models of the projects they created as learning outcomes of the various activities they did under this STEM project. Dr. Sagar and Mr. Chanpreet Singh (Project Manager, CURIN) were invited by the school to witness this exhibition of students' projects.

- A similar science exhibition was held on October 21 at V.B. International Senior Secondary Smart School in Zirakpur. Dr. Sagar Juneja, Mr. Chanpreet Singh, Dr. Amanpreet Kaur (Assistant Professor, CURIN), and Mr. Parul Chawla (Manager, CURIN) took part in this exhibition and interacted with the students about their projects.

A Workshop by Centre for Life Sciences on 'Plasmid Vector Cloning and Cell Culture Techniques'

The Centre for Life Sciences (CLS), CURIN, Chitkara University, Punjab, features a biosafety level-2 laboratory, with the group specializing in signal transduction processes and cellular network communication for non-communicable diseases (NCDs). Leveraging advanced technologies, the centre's ongoing projects include the development of a personalized algorithm for cardio-renal risk prediction. In parallel, researchers at CLS are also investigating the gene regulation within pancreatic beta-cells, mapping its intricate regulatory network of forming specific proteins maintaining pancreatic homeostasis. These endeavours contribute significantly to understanding the molecular intricacies underlying NCDs. The centre's commitment to unravelling complex cellular mechanisms positions it as a hub for the intersection of technology and biology.

During October 30 – November 4, CLS conducted a six-day intensive hands-on training-cum-workshop on Plasmid Vector Cloning and Cell Culture Techniques and it was delivered by Dr. Varsha Singh – Assistant Professor, CURIN, who also heads the CLS.

The workshop attracted participants from esteemed institutions such as JNU, INST, Panjab University, and GNDU Amritsar, showcasing the significance of the event in drawing interest from diverse academic backgrounds related to biochemistry, biotechnology, and genetic engineering. It covered both theoretical and practical aspects of molecular biology and related techniques. Topics ranged from gene expression vectors and techniques to molecular cloning, transformation of plasmid vectors containing human genes, and mammalian cell culture.

The schedule also focused on advanced topics for Real Time Polymerase Chain Reaction (RT-PCR), RNA isolation, and RT-PCR result analysis. The inclusion of both theory and hands-on practical sessions allowed participants to gain a holistic understanding of the techniques involved. PCR, being the fundamental tool in molecular biology, allows the amplification of DNA segments. Given its widespread application in various research areas, training in PCR techniques is crucial for scientists and researchers.

A pivotal aspect of the workshop was the emphasis on cell culture techniques, particularly with Human Embryonic Kidney 293T cells (HEK293T). HEK293T cells are derived from the kidney tissue of a human embryo. The original HEK293 cell line was created by Frank Graham and colleagues in 1973, and later the T-antigen from SV40 virus was introduced to make the HEK293T subline. Classified as immortalized cells, meaning they can continuously divide and proliferate in culture. They are often used as a model system for studying various cellular processes and to produce recombinant proteins. Currently, the lab houses the cells kept under minus (-)196°C. The

workshop shed light on the significance of maintaining and manipulating these cells, highlighting their role in producing recombinant proteins and studying genes and providing hands on training sessions to the external participants.

Cloning techniques, including plasmid vector cloning, transformation, and gene expression studies, were also extensively covered, providing participants with hands-on experience in genetic engineering. Centre for Life Sciences (CLS), a biosafety levels -2 (BSL-2) facility, houses aseptic working conditions. The workshop also provided the participants with essentials for handling the techniques under BSL-2 conditions. The following key aspects were taught -

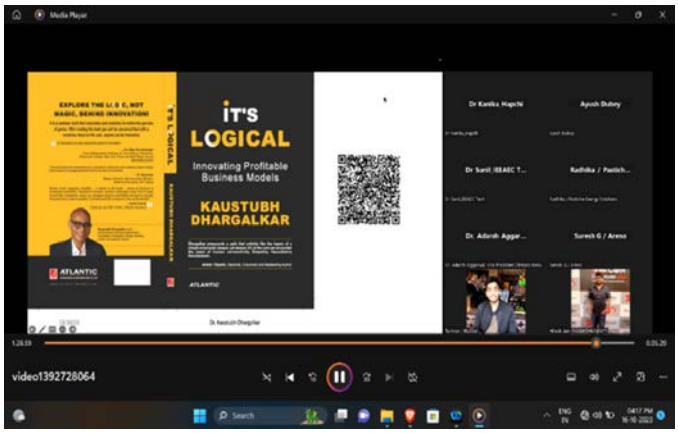
- HEK293T cells, being of human origin, pose a potential risk of harboring human pathogens or contaminants. BSL-2 training ensures that researchers are equipped to handle materials with moderate risk and take appropriate precautions to prevent accidental exposure or contamination.
- The cloning and transformation techniques involve the use of vectors and genetic material, which may include potentially infectious agents. BSL-2 training imparts knowledge on how to handle biological materials with a moderate risk of causing harm and emphasizes the use of proper containment measures.
- Maintaining human cell lines like HEK293T in culture requires stringent aseptic techniques to prevent contamination by bacteria, fungi, or other microorganisms. BSL-2 training includes protocols for maintaining a sterile environment during cell culture procedures, reducing the risk of contamination, and ensuring the reliability of experimental results.
- Genetic engineering techniques generate biological waste that may contain potentially hazardous materials. BSL-2 training covers proper waste disposal methods, emphasizing the importance of handling and disposing of biological materials in accordance with safety regulations. BSL-2 training includes education on emergency response protocols in case of accidental spills, exposure, or other laboratory incidents. Knowing how to respond to emergencies ensures the safety of researchers and laboratory personnel.
- Many research institutions and regulatory bodies require adherence to biosafety guidelines and standards. BSL-2 training ensures that researchers are compliant with institutional and regulatory biosafety requirements, promoting responsible and ethical research practices.

Activities to Support Pre-incubation, Incubation and Promote Industry-Academia Collaborations

By Chitkara Innovation Incubator Foundation (CIIF), and DST funded NewGen IEDC and Technology Enabling Centre (TEC), CURIN

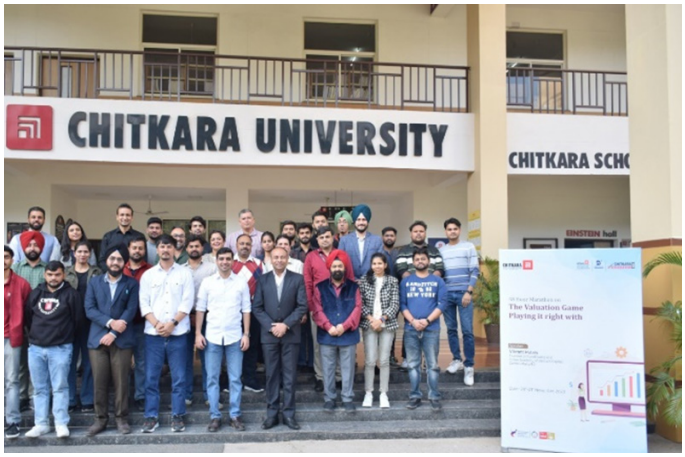
Design Thinking Workshop

A workshop on Design Thinking conducted by Mr. Kaustubh Dhargalkar - Author and Design Thinking Coach, REDX was organised by CIIF on November 13. It aimed to delve into the principles and applications of design thinking, offering valuable insights to the participants. Mr. Kaustubh Dhargalkar commenced the session with an insightful introduction to the concept of design thinking. He emphasized its relevance in solving complex problems, fostering innovation, and enhancing user-centric solutions.



A Workshop titled, The Valuation Game and Playing it Right

Mr. Vikrant Potnis – Founder, FundEnable, Mumbai was invited by CIIF to deliver a workshop on The Valuation game and Playing it Right on November 20-21. The focus of the workshop was on navigating the intricacies of business valuation and understanding the strategies to play the valuation game effectively. Mr. Vikrant who is a seasoned entrepreneur, and the driving force behind FundEnable shared his valuable insights on the art and science of business valuation. He delved into the importance of accurate valuation for startups seeking funding, mergers, and acquisitions. He gave real-world examples and case studies to illustrate the nuances of the valuation process. The workshop was attended by several start-ups incubated at CIIF as well as faculty members and students of our university.

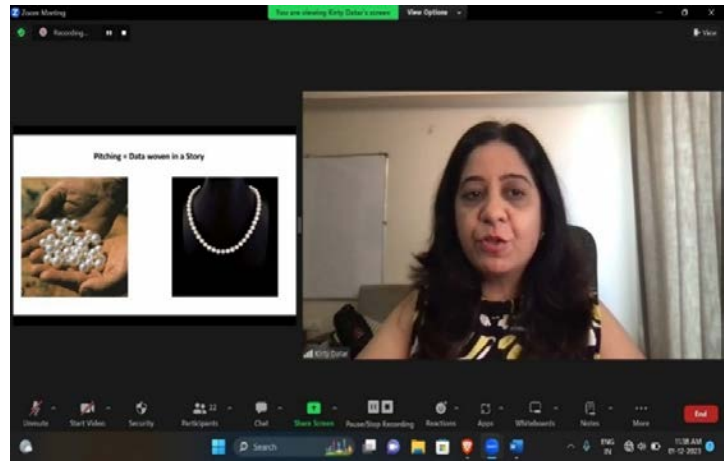


A Session on Creating a Winning Pitch Deck and Art of Storytelling

Ms. Kirty Datar – Co-Founder, CaneBOT was invited to deliver a session on Creating a Winning Pitch Deck and Art of Storytelling on December 1, who stressed upon the critical role a pitch deck plays in attracting investors and stakeholders. She highlighted that a well-crafted pitch deck serves as a visual aid that communicates the essence of a business idea concisely and persuasively. The speaker delved into the key elements that make a pitch deck to stand out. This included a compelling problem statement, a clear value proposition, a thorough market analysis, a detailed business model, financial projections, and a robust team introduction. Ms. Datar stressed upon the significance of balancing information and visual appeal in each slide.

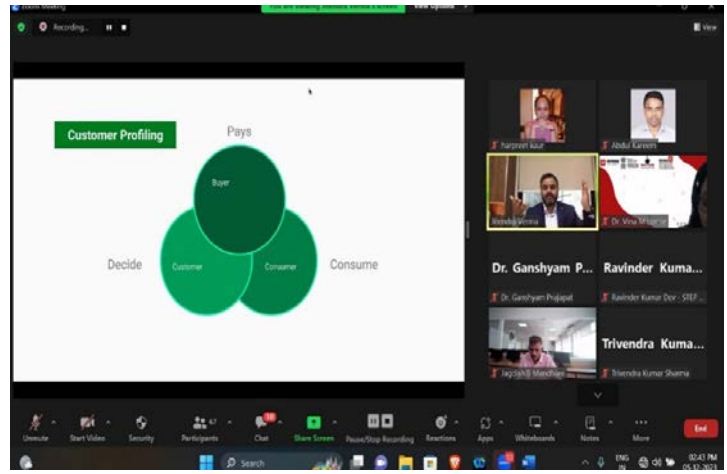
Then, she covered the art of storytelling, asserting that effective communication is at the heart of a convincing

business pitch. She shared techniques on how to weave a narrative that captivates the audience, resonates emotionally, and leaves a lasting impression. Real-life examples and case studies were used to illustrate the power of storytelling in business presentations. Close to 15 start-ups attended this session.



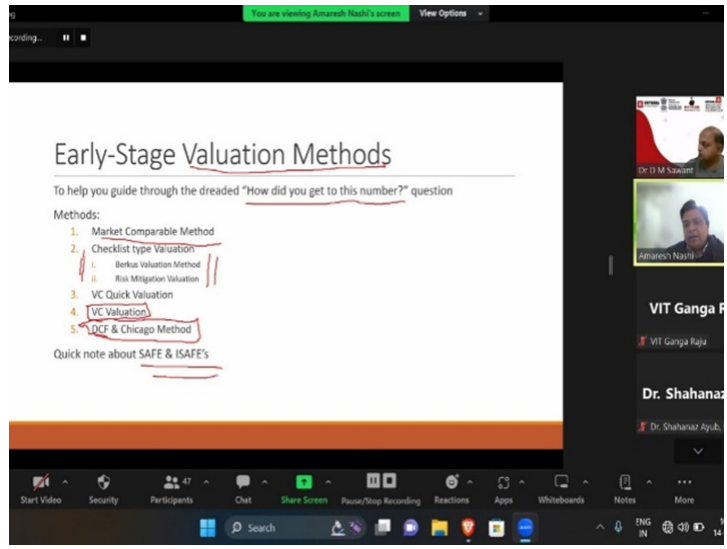
Session on Transforming Problems into Viable Business Concepts

Organized by CIIF, the session was delivered by an invited speaker, Mr. Jitendra Verma on December 5. He began by challenging the conventional view of problems, encouraging the audience to see them as potential opportunities. He emphasized that many successful businesses have emerged from addressing and solving real-world problems. The speaker provided real-life case studies and examples to illustrate how various companies, both large and small, have successfully identified problems and transformed them into thriving business ventures. There were over 60 participants comprising of researchers from academia, student innovators and entrepreneurs in the session.



Session on Sprout Your Dreams: Unearth the Secrets of Idea Financing

Amaresh Girish Nashi, a luminary in the field, holding the esteemed position of Senior Associate at the Project Appraisal & Management Division of NITI Aayog, Government of India, delivered this wonderful session that was held on December 12 and was organized by CIIF. He uncovered the hidden intricacies and strategies necessary for turning dreams into viable projects. Attendees were treated to a comprehensive exploration of the funding ecosystem, ensuring they become armed with the knowledge needed to transform their innovative concepts into tangible realities. Drawing from his experience at NITI Aayog, Mr. Nashi shared valuable insights into project appraisal and management. Understanding how to present and manage projects is crucial for securing financial backing, and attendees gained invaluable perspectives on this aspect. A large number of faculty entrepreneurs and researchers from different institutions attended this session.



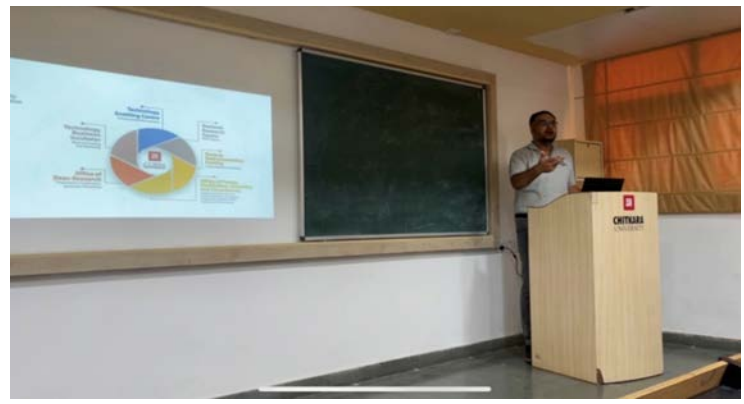
Session for Startups on Exploring the Canadian Innovation Landscape

Mr. Arvind Aryan - Head Strategy, Toronto Business Development Centre (TBDC), Canada, and Mr. Aditya Jha - Chief Mentor, TBDC, Canada, were invited by CIIF to deliver this wonderful session on December 12 that benefitted 15 startups. Both speakers provided a comprehensive overview of the Canadian innovation ecosystem. This included an exploration of research institutions, industry collaborations, and government initiatives that collectively contribute to Canada's position as a global innovation hub. The event highlighted success stories and case studies from TBDC,

illustrating how innovation can be harnessed to solve real-world challenges. Attendees gained practical insights into the journey from ideation to successful implementation, learning from tangible examples within the Canadian context.

Sessions on Ideation to Prototype and Pre-incubation Funding Opportunities

Dr. Sagar Juneja – Associate Director (Research), Chitkara University conducted two sessions for the engineering students, including the undergraduate and masters studens as well as PhD scholars, to educate them about the benefits of pre-incubation funding and mechanism by which they can secure pre-incubation funding for their project prototypes from the university. The session titled, Ideation to Prototype: The Secret of Building High-Fidelity Prototypes was held on October 20 and it highlighted the outcomes of the projects that were carried out in a systematic manner with funding support from NewGen IEDC. The second session was titled, How Pre-incubation Center @CURIN is Boosting Innovations in and around the University. In this session, the role of NewGen IEDC in supporting students' projects was highlighted. More than 100 students benefited from these two sessions.



A Session on the Importance of Pre-incubation Funding to Build Industry-Ready Products

Chitkara University NewGen IEDC organized this session on October 26 for the students of Electrical Engineering Department to apprise them about the pre-incubation funding support available at the university. Several case studies of past projects supported by NewGen IEDC were shared with the participants to highlight how pre-incubation funding acts as seed money for academic projects that opens -up multiple avenues for the projects for scaling-up. The session was attended by close to 50 students. Another related session titled, Start of an Entrepreneurial Journey: Why Every Student Must Apply for Pre-Incubation Funding was organized on October 30 for the students of Mechanical and Electrical Engineering Departments. Both sessions were delivered by Dr. Sagar Juneja.

Activities to Promote Industry-Academia Collaborations

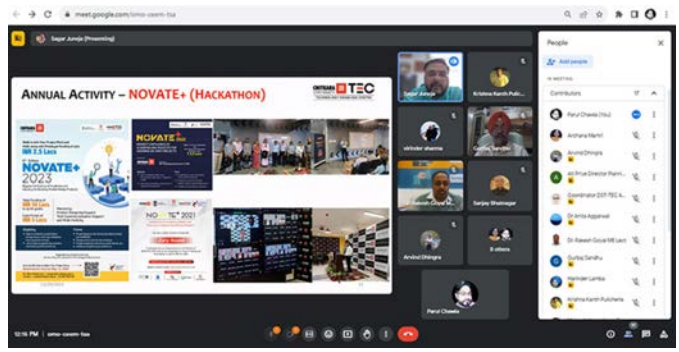
Chitkara University has a Department of Science and Technology (DST) funded Technology Enabling Centre (CU-TEC) to promote industry-academia collaborations in the region for joint development of technologies. CU-TEC took several initiatives in Q4, 2023, some of which are listed below.

- On November 3, a team from CU-TEC comprising of Dr. Sagar Juneja and Parul Chawla (Manager, CURIN), visited Ambala College of Engineering & Applied Research and attended their Science & Technology Fair to understand the work their faculty and student innovators were doing. The team also met Mr. Rama Kant, who heads the

incubator at the college to explore opportunities of collaboration.

- A team from CU-TEC headed by Dr. Sagar Juneja visited MSME Development Institute, Ludhiana on November 8 and met the Director, Mr. Virinder Sharma and Assistant Director, Mr. Kundan Lal. There were discussions on how the two organizations can work together for promoting industry-academia collaborations. Dr. Sagar gave insights into the upcoming activities of CU-TEC and sought support from the MSME Development Institute. On the same day, the CU-TEC team also met Dr. Arvind Dhingra of GNDEC, Ludhiana, who also heads the Science & Technology Entrepreneurs' Park (STEP) at GNDEC. There were deliberations on how CU-TEC and STEP can add value to each other and the stakeholders by collaborating with each other.

- During November 24-25, an Industry-Academia Meet was organized to showcase as many as 31 academic technologies to the industry leaders of the region with an aim of commercializing those technologies. These technologies belonged to software, electronics, automation, manufacturing, automotive medical & assistive domains. The industry leaders who attended this event and witnessed the presentations by the technocrats from academia included, Mr. Harinder Pal Singh Lamba (President, Patiala Industry Association), Mr. Jatinder Singh Sandhu (President, Patiala Chamber of Industries), Mr. Rama Kant (Director, EPIC, Ambala), and Mr. Harpreet Singh (Director, Eon Infotech Ltd., Mohali). The meet was also attended by Mr. Sanjay Bhatnagar (Head, Tech-Commercialization, Chitkara University, Punjab) and Dr. Neeraj Kumar (Senior Incubation Manager, CIIF), and it was convened by Dr. Sagar Juneja with support from Parul Chawla.



- The Program Advisory Group (PAG) Meeting of CU-TEC was held in an online mode on November 29. The objective of the meeting was to review the progress of work done by CU-TEC in the FY 22-23 and FY 23-24 (till date). The meeting was attended by 15 PAG members comprising of two representatives from the DST, EAG member nominated by the DST, representatives from two other TECs, leaders from the regional industries and industry associations and senior academicians from the regional institutions and host institution. The meeting was chaired by Dr. Archana Mantri – VC, Chitkara University, Punjab and Chief-Coordinator, CU-TEC and the progress presentation was delivered by Dr. Sagar Juneja.

International Conference Organized by the 'Chitkara University Publications' Division

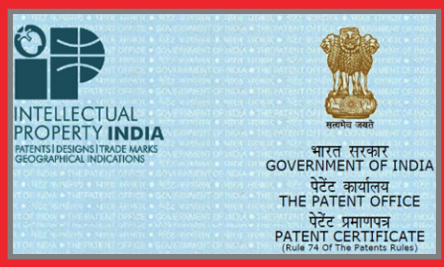
The division of Chitkara University Publications working under CURIN, successfully conducted the First International Conference on Emerging Materials, Smart Manufacturing and Computational Intelligence on December 7 and 8, 2023. The conference focused on technological evolutions, inventions, and developments in the fields of emerging materials, smart sustainable manufacturing, image processing, data science, signal processing, wireless sensor networks, biomedical imaging, robotics intelligence, clean energy, and cutting-edge technologies that drive sustainability. The conference featured 8 track areas in which 190 researchers submitted their papers. The accepted and presented papers will be sent for publication in the American Institute of Physics Conference Proceedings, which is Scopus indexed. The acceptance rate of the conference was 30%.

Dr. Praveen Kumar Khosla - Pro Vice Chancellor (Research), Chitkara University, Punjab led the inaugural ceremony of the conference that featured keynote addresses by the internationally recognized scientists, including Prof. Duc Truong Pham (University of Birmingham, United Kingdom), Prof. Yudong Zhang (University of Leicester, United Kingdom) and Dr. Sanjeev Kumar (CSIR-CSIO, Chandigarh, India). These keynote talks were followed by paper presentations by the authors of accepted papers.

Similarly, day-two also witnessed several invited talks by eminent researchers and industry professionals, including Prof. (Dr.) Pradeep Kumar (Indian Institute of Technology, Roorkee, India), Dr. Bhupendra Singh (Centre for Robotics and Artificial Intelligence, DRDO, Bengaluru , India), and Mr. Mukesh Singh (General Manager, Business Excellence, LPA Bossard Pvt. Ltd., India). Day-two also featured paper presentations. The best paper and best reviewer in each track were awarded in the valedictory session of the conference.

The first edition of this unique conference was organized under the guidance of Dr. Archana Mantri – Vice Chancellor, Chitkara University, Punjab, and was led by Dr. Ankit Sharma – Associate Director (Research), CURIN, Chitkara University, Punjab. He was ably supported by his team that included Dr. Ayush Dogra, Dr. Sonam Mittal, Krimika and Abhimanyu Katyal. Dr. Ankit Sharma in his valedictory note expressed his desire and need for such conferences in future as an active platform for the presentation and exchange of ideas and thoughts amongst the scientific community.

24 Patents Filed by CURIN Faculty Members and Scholars in Q4



The Patent Office has Granted **131 Patents** to Chitkara University in Q4, 2023.

A total of 70 patents (including industrial designs) have been filed by different departments of Chitkara University during October - December 2023, out of which 24 have been filed by CURIN faculty members and researchers. The details of these 24 patents are given below.

S. No.	Title	Inventors	Application Number
1	AI-Enabled IOT and Block-chain-based System for Pest Detection using Sound Analytics in Large Agriculture	Rajesh Kumar Kaushal, Naveen Kumar, Rajesh Kumar Dhanaraj, Akkas Ali, Malathy Sathyamoorthy, Kritika Sharma	202311073642
2	An Android based System and Approach for Supporting Individuals with Social(Pragmatic) Communication	Muskan Chawla, S.N. Panda, Vikas Khullar	202311073796
3	Assistive Glove for Enhanced Hand Functions	Sadbhawna, Satyam Kumar Agrawal	202311073795
4	Automatic Fan Cleaner	Amanpreet Singh, Amandeep Kaur, Deepali Gupta, Rupinder Singh, Maninderjit Singh, Jaspreet Singh	202311067484
5	Efficient Textile Drying System with Microwave Heating, Centrifuge Technology and Vacuum Technology	Varinder Singh, Nitin Kumar Saluja	202311071214
6	Enriched Nutrient Pot for Flora	Ajay Khajuria, Jyotsna Kaushal, Shubam Sudan	202311084540
7	Examination Entrance Two-Tier Access Management System	Rashpinder Kaur, T. L. Singal, Gurjinder Singh, S. N. Panda	202311073791
8	Gamified Knee Exerciser with Real-Time Health Monitoring System	Amandeep Singh, Ankit Sharma, Bhanu Sharma, P. K. Khosla	202311073792
9	Hand-Brake Notification System in Vehicle and a Vehicle Thereof	Shikha, Deepali Gupta, Ramneet, Chetna, Anu Mittal	202311069302
10	Hand-Held Stem Grafting Equipment	Kulbhushan Sharma	202311073638
11	Photo Retinoscope	Navneet Sharma, Astha Mishra, Diksha Kumari, Surya Narayan Panda	202311068734
12	Precision Stylus Device for Non-Touch Sensitive Screens	Varun Jindal, Vinay Kukreja, Ayush Dogra	202311071215
13	Priority Encoded Traffic Light Congestion Controller	Rahul, Neha Sharma, Sheifali Gupta, Rupesh Gupta	202311066537

14	Smart Luggage-Carrying Portable Assistive Device	Naveen Kumar, Rajesh Kaushal, Sanjeev Verma, Kanwalvir Singh Dhindsa, Suresh Limkar	202311071213
15	Smart Tap Device with Automatic Tap Turning Tap Off Feature	Varun Jindal, Vinay Kukreja, Ayush Dogra	202311073793
16	Spectacle Mounted Device and Terminal for Visual Acuity Test (Dynamic & Static) with Mixed Reality	Navneet Sharma, Renu Thakur, Bhanu Sharma, Surya Narayan Panda, Sonu Goel	202311073641
17	System and Method for Agricultural Monitoring using an Unmanned Aerial Vehicle	Jolly Masih, Amit Mittal	202311066102
18	System and Method for Regulating Air Pressure Inside Tyre of a Vehicle	Nishant Garg, Radhika Gupta, Maninder Kaur, Vinay Kukreja	202311069333
19	System for Automatically Adjusting Swing of an Appliance and Method Thereof	Varun Jindal, Vinay Kukreja, Raj Gaurang Tiwari	202311067300
20	System for Conducting Virtual Reality-based Experiments	Bhisham Sharma, Manoj Gaur, Madhu Aneja	202311071212
21	System for Managing Agricultural Parameters and Livestock and Method Thereof	Heena Wadhwa, Mandeep Kaur, Htet Ne Oo, Leema Nelson	202311067735

INDUSTRIAL DESIGN REGISTRATIONS

22. Multiutility Bucket

By: *Mrinal Paliwal, Chander Prabha, Neha Sharma, Retinderdeep Singh, Anjuli Goel, Varun Jindal*

Application No. 397051-001

23. Multi-Glass Water Pouring Device

By: *Rakesh Goyal, Harjeet Singh, Arun Upmanyu, Punam, Dhawal Goyal, Sudesh Mittal, Partha Khanra, Kamaljeet Singh, Jyoti, Heranmoy Maity*

Application No. 397047-001

24. Smart Ergonomic Portable Commode Chair

By: *Naveen Kumar, Sanjeev Verma, Rajesh Kr. Kaushal, Surya Narayan Panda, K.S. Bath, Kalpna Guleria, Kritika Sharma*

Application No. 400065-001

CURIN's Contributions in Events and Activities

Delivered Invited Talks, Chaired Technical Sessions, Presented Papers in Conferences, Attended Training Programs, and Workshops

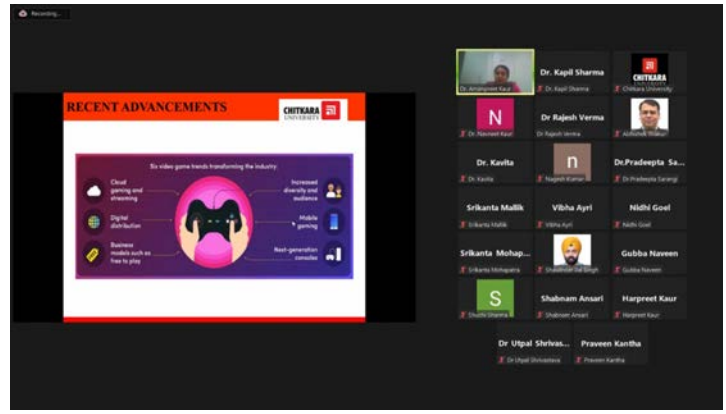
Participation as Resource Persons

- Dr. P.K. Khosla, Pro VC, CURIN, was invited as a panellist in the Annual Information Security Summit organized by the Data Security Council of India in Gurugram on December 20. He shared profound insights into the realm of productizing cyber security from a researchers' perspective. Attended by over 1500 delegates, this impactful event witnessed active participation of 44 motivated students from Chitkara University serving as volunteers.
- Dr. Pankaj Kumar – Pro VC (Research), and Head, Centre for Liquid Crystal Research (CLCR), CURIN, Chitkara University, Punjab, was invited to participate in the 30th National Conference on Liquid Crystals (NCLC-2023). It was organized by Andhra University, Visakhapatnam, Andhra Pradesh, India, in association with Indian Liquid Crystal Society during November 2-4, 2023. Prof. Pankaj delivered an invited talk on Augmented Electro-Optical Properties of Normal and Reverse Mode PDLCs: Doping of Nanoscale Particles and Dichroic Dyes at the conference.
- On the occasion of World Food Day, Dr. Jyotsna Kaushal - Professor and Head, Centre for Water Sciences, CURIN, delivered an interactive session on Water is Life, Water is Food, which was attended by 36 students of the Nutrition and Dietetics course. The session also featured hands-on training for testing parameters of water quality, and it was held on October 16.
- Dr. Sagar Juneja – Associate Director (Research), CURIN, was invited as one of the resource persons in the startup conclave titled, The Big Fish Pool - Season 2, which was organized by CT University, Ludhiana, Punjab. He was one of the panelists in the panel discussion on the topic, Catalyzing Innovation: The Evolving Role of Startups in Higher Education Institutions.

  Dr. Sagar was also invited as one of the resource persons at the ACM India Chapter Summit 2023 that was held in Manipal University, Jaipur during

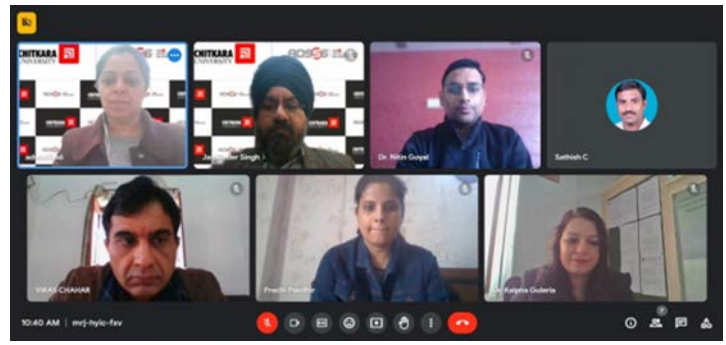
December 21-22. He shared valuable insights about the ACM India Student Chapters portal with the delegates.

- Dr. Amanpreet Kaur – Assistant Professor, CURIN, was invited by Chitkara University, Himachal Pradesh to deliver multiple expert talks on the topics of Game Design and Augmented Reality in Education, in a ten-day short-term capacity building program on Technological Advancement in Higher Education System. Held during December 11-19 and attended by 50 faculty members from different institutions, this faculty development program was organized by the Academic and Administrative Development Centre (AADC), established by the Association of Indian Universities (AIU) at Chitkara University, Himachal Pradesh.



Session Chairs and Reviewers in Conferences

- Dr. Manish Sharma and Dr. Kalpana Guleria – Professors, CURIN, chaired paper presentation sessions in the Applied Data Science and Smart Systems Conference (ADSSS 2023), which was held during December 15-16, 2023, and organized by the Department of Computer Applications, Chitkara University, Punjab.
- Dr. Deepali Gupta – Professor, CURIN, served as a session chair at the National Seminar on Quality Assurance in Higher Education (QAHE – 2023), held during 15-16 December 2023.



- Dr. Naveen Kumar - Associate Professor, CURIN, chaired a session in the 3rd International Conference on Advanced Network Technologies and Intelligent Computing (ANTIC-2023). The conference took place over a span of three days, from December 20 to December 22, 2023, and was hosted by the Department of Computer Science at the Institute of Science, Banaras Hindu University (BHU), Varanasi, India.
- Dr. Kalpna Guleria and Dr. Amanpreet Kaur (Assistant Professor, CURIN), chaired paper presentation sessions in the Chitkara University Doctoral Consortium (CUDC-2023) that was held at Chitkara University, Punjab during November 3-4, 2023.
- Dr. Mudita Uppal - Assistant Professor, CURIN, served as a session chair in the 3rd International Conference on Smart Generation Computing, Communication and Networking (SMART GENCON 2023) that was held during 29 – 31 December 2023. She also served as a reviewer in the 2nd International Conference on Communication, Security, and Artificial Intelligence (ICCSAI-2023), which was technically co-sponsored by IEEE UP SECTION and was held during November 23-25 at Galgotias University, Greater Noida.
- Dr. Sonam Mittal - Assistant Professor, CURIN, chaired a paper presentations session in an International Conference on Computer Science and Mathematics (COMAT 2023). The conference was organized by the New Research and Innovation Society, Walchand Institute of Technology, Solapur, in collaboration with Bursa Uludag University, Turkey and the Ministry of MSME, GoI during December 29 – 31. She also served as a reviewer in the IEEE MYSURUCON 2023, the 3rd edition of the flagship international conference organized by the IEEE Mysore sub-section in collaboration with the IEEE Bangalore section. Hosted by Malnad College of Engineering, Hassan, it was held during December 1-2, 2023.

- Dr. Vatsala Anand – Assistant Professor, CURIN, served as a session chair and Dr. Amanpreet Kaur served as a reviewer in the International Conference on Emerging Materials, Smart Manufacturing and Computational Intelligence that was held from 7 to 8 December 2023 at Chitkara University, Punjab.

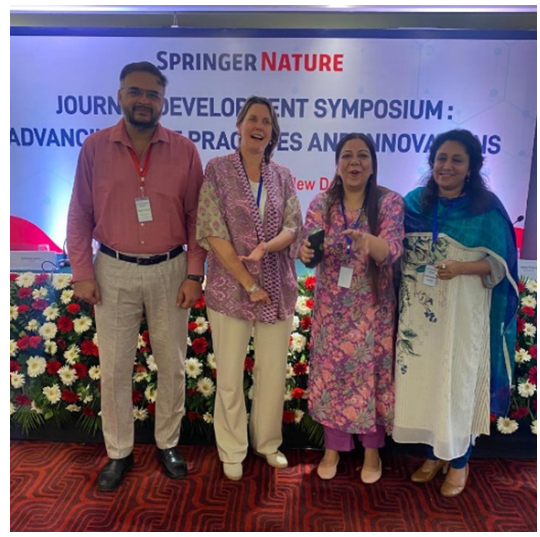
Paper Presentations in Different Conferences

- Researchers and scholars from the Centre for Liquid Crystal Research (CLCR), CURIN, including Dr. Vandna Sharma, Dr. Ankit Rai Dogra, Dr. Ridhima Gahrotra, Rajat Takkar, Parul Malik and Pooja Dhariwal, led by Dr. Pankaj Kumar, presented three research papers in the prestigious 30th National Conference on Liquid Crystals (NCLC-2023) that was organized by Andhra University, Visakhapatnam, Andhra Pradesh, India, during November 2-4, 2024. The titles of these papers are as follows. Temperature Dependent Morphological and Electro-optical Characteristics of Vertically Aligned Liquid Crystal; Studies on Morphological, Electro-optical and UV Absorbance Characteristics of Dye-doped Cholesteric Liquid Crystals for Enhanced Optical Efficacy; and Synthesis and Characterization of Copper Quantum Dots and Effect of their Doping on the Performance of Vertically Aligned Liquid Crystal Display Cells.
- The same research group presented three papers in CUDC 2023 as well, these papers were titled, A short Review on Effect of Quantum Dots on the Electro-optical and Morphological Behaviour of Polymer Dispersed Liquid Crystal; Morphological, Electro-optical and UV-visible Spectroscopic Analysis of Pure Cholesteric Liquid Crystal; and Liquid Crystals with Vertical Alignment by Directly Generating Multilayer Nanoparticle Assemblies on Indium Tin Oxide Substrates in Confined Cells: Morphological and Electro-optical Studies.
- Dr. Manish Sharma – Professor, CURIN, along with his research scholars, including Parminder Kaur and Lovish Matta presented two papers in CUDC 2023. These papers were titled, An Ultra Compact 70 GHz Circular Patch Antenna For V- Band Millimeter Wave Applications and Design of a Circular Shaped Multiband Antenna with Moon Shaped Slot for Ultrawide Band Applications.
- Seema Gulati, PhD Scholar working under the supervision of Dr. Kalpna Guleria presented a paper titled, Detecting Ocular Diseases using Pre-trained Deep Learning Models in CUDC 2023. Another scholar of Dr. Kalpana, who is also working under the guidance of Dr. S.N. Panda – Pro VC (Research), CURIN, Meena Rani, also presented her paper titled, Enhancing Latency Performance in Fog Computing through Intelligent Resource Allocation and Cuckoo Search Optimization in CUDC 2023.
- Monica Dutta, working under the guidance of Dr. Deepali Gupta, presented a paper titled, Smart Precision Farming in Substrate Medium - A Practical Analysis in the 9th International Conference on Signal Processing and Communication (ICSC) that was held at JAYPEE Institute of Information Technology, Noida during 21 – 23 December. She has also presented another paper titled, Mapping Smart Vertical Farming in Cultivation of Herbaceous Medicinal Plants using Bibliometric Analysis in the International Conference on Advances in Computation, Communication, and Information Technology, which was organized by Manav Rachna International Institute of Research and Studies, Faridabad, India during November 23-24. In the same conference, Dr. Mudita also presented a paper that was titled, ESSS: Energy Saver Smart Shoes for Energy Harvesting using Multi Sensors Technique. Dr. Mudita presented two more papers in CUDC 2023 that were titled, The Impact of Unstable Symmetries on Software Engineering; and The Influence of Compact Modalities on Complexity Theory.
- Dr. Sonam Mittal presented a research paper titled, A Dynamic Key Method for OFDM-based Encryption in the 5th International Conference on Sustainable Innovation in Engineering and Technology 2023, which was organized by Asia Pacific University, Kuala Lumpur, Malaysia. Additionally, her research scholar, Ankita, presented three papers in three different conferences. These papers were titled, A Report: Machine Learning and its Applications; Comparative Analysis of Shallow Learning and Deep Learning Models; and Employee Attrition Prediction Using Machine Learning Algorithms.
- Swati Goel, PhD Scholar working under the supervision of Dr. S.N. Panda and Dr. Kalpna Guleria, presented a paper titled, The Role of Fog Computing and IoT in WBAN: Enhancing Healthcare Efficacy in the 12th International Conference on System Modelling & Advancement on Research Trends (SMART-2023) that was organized by TMU Moradabad, UP,

India during December 22-23, 2023.

- Master of Engineering Scholars working under the guidance of Dr. Kalpna Guleria and Ms. Shagun Sharma, including Somya Srivastav, Archana Saini and Gurpreet Singh presented papers at multiple conferences.

Faculty Development Programs (FPDs) Attended



- Dr. Sagar Juneja was invited by Springer Nature to attend the Journal Development Symposium, which was held in New Delhi on October 31. It was an opportunity for the academicians to share their experiences of handling academic journals. Notably, Dr. Sagar has handled two topical issues in the SN Computer Science journal.
- Additionally, on October 11-12, Dr. Sagar attended the India CSR Summit 2023 in New Delhi, which was organized by CSRBox. He participated in this mega event to understand the landscape of CSR funding opportunities.
- Dr. Mudita participated in a one-week FDP on Machine Learning that was organized by NSMS Institute of Pharmacy in association with Pantech E-Learning from 20 to 25 November 2023. She also attended a FDP on IoT and Machine Learning that was held during November 27 – December 2 and was organized by PVKK Institute of Technology in association with Pantech E-Learning.
- Dr. Sonam Mittal attended a five-day FDP on Quantum Computing Tools and Applications for Addressing Recent Challenges. The FDP was organized by the School of Computer and Engineering, Vellore Institute of Technology, Chennai from December 5 to 9. She attended another FDP on ChatGPT and AI Tools for Academician. It was held at ASET College of Science and Technology, Chennai during November 27 – December 1. The program focused on enhancing academic capabilities through insights into AI tools and the innovative applications of CHATGPT technology. Faculty members engaged in collaborative learning and gained valuable skills to enrich educational experiences and stay at the forefront of technological advancements in academia.
- Dr. Manish Sharma, along with his research scholars, Parminder Kaur and Lovish Matta, attended a five-day online workshop on Antenna Design Techniques for Various Applications. It was organized by the Care College of Engineering, Chennai, Thayanur from 12 to 16 December.

  Parminder Kaur also attended a five-day workshop on Bibliometric Analysis: Enhancing Scholarly Impact in the Modern Era from November 28 to December 2, 2023, at Chitkara University, Punjab.

A Coding Event Organized

The Nanomaterials Research Laboratory, CURIN, collaborated with the Electrical Engineering Department of Chitkara University, Punjab to host an event titled, CodeCrafters, which was held on November 28. CodeCrafters sought to offer a platform for aspiring programmers to showcase their ingenuity and technical skills in the realm of C programming. The purpose of this event was to observe the wide variety of projects created by our skilled first-year students and give them direction. Dr. Shaily Jain – Associate Professor, Electrical Engineering Department and Dr. Bhanu Sharma - Assistant Professor (Research), CURIN assessed the projects presented by the students. Over 45 students took part in this event that was convened by Dr. Aashish Kumar - Assistant Professor, CURIN, and Dr. Arrik Khanna - Assistant Dean, Electrical Engineering Department.

List of Publications

169 publications by CURIN in Q4

[1] A. Aggarwal, and V. Hajra, "Senior Citizen Tourists' Push and Pull Motivations: An Approach–Avoidance Perspective," *Tourism Review,* 2023.

[2] A. Aggarwal, V. Kukreja, and K. Nobi, "Developing a Benchmarking Model for Subjective Well-Being: A Combined Approach Using Structural Equation Modeling and Fuzzy AHP," *International Journal of Quality and Service Sciences ahead-of-print*, 2023.

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