



COVER STORY

7th Edition of Annual Excellence Awards

CURIN Faculty Members Won Awards in all Six Categories

CURIN Organized
Biggest Industry-Academia Conclave
*To promote collaborations for
joint development of technologies*

NABL Accreditation
Chitkara University Central
Instrumentation Facility



FACULTY ACHIEVEMENTS

- Emerging Faculty Start-up Award
- Outstanding Reviewer Award
- Third Prize in the National Level Competition on Cyber Security
- Recognition in Prestigious PV Magazine

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EDITORIAL

First of all, I would like to begin by congratulating my fellow colleagues at CURIN who have won laurels at both internal (within Chitkara University) and external platforms in Q1, 2023. You will find the details of all those achievements of CURIN members in this issue. CURIN believes in promoting collaborations with external institutions and industry for the purpose of joint research and innovations. You will get glimpses of our efforts toward building meaningful collaborations with external stakeholders in this issue of the newsletter. In-fact, a section on Insights CURIN in the current issue, discusses the National and International Research Collaboration Initiative of the university. In the first quarter of 2023, we conducted several events, most of which were supported under various government funding schemes to promote concepts like innovation, prototyping, entrepreneurship, awareness about social issues, etc. The details of these events have been included. Both internal and external stakeholders benefited from these events. Additionally, you will find summaries on top-five research papers of CURIN published during January – March 2023 in this issue. Similarly, the details of patents filed by CURIN and list of publications of CURIN researchers during the same period have also been included. There are a total of 13 articles in this issue, which I hope you will find interesting to read!

Happy Reading!

Sagar Juneja

Editor, Res Novae

7th Edition of **Annual Excellence Awards** Organized by Chitkara University

CURIN Faculty Members Won Awards in all Six Categories

Chitkara University strives for excellence, not only in academics, but also in research, innovation, IPR, and entrepreneurship. With NAAC A+ accreditation and 2nd Rank in Atal Ranking of Institutions on Innovation Achievements (ARIIA) in the category of Private Self-Financed University, till December 2022, Chitkara University has secured government funded projects worth INR 800 million, and carried out industry consultancy worth INR 500 million. Additionally, the university has to its credit, over 4000 quality research publications and over 2200 patents of which more than 500 have been granted.

These fascinating numbers are primarily due to the faculty members and researchers of Chitkara University who passionately contribute to the vision of the university, which is about promoting academic excellence through interdisciplinary applied research. To recognize and reward the contribution of its faculty members and researchers, university conducts Annual Excellence Awards.

A glittering function of the 7th edition of Annual Excellence Awards was organized on February 4, 2023 in which a total of 534 faculty members walked away with cash incentives of INR 21.3 million. Additionally, the top performers in six categories namely Publications, Patents, PhD Supervision, Extramural Funding, Consultancy and Entrepreneurship were awarded. **The faculty members from CURIN won top performer awards in each of the six categories. These top performers from CURIN along with their contributions have been highlighted in this cover story.**



Dr. Madhu Chitkara (Pro-Chancellor, Chitkara University) graced the Awards Function with her kind presence, which was a great encouragement for the faculty members of the university. The Chief Guest of the Awards Function was Dr. Mrityunjay Mohapatra - Director General of Meteorology, India Meteorological Department (IMD), Government of India. IMD also signed a MoU with Chitkara University in the Awards Function to facilitate research collaborations and joint projects between the two institutions.



Top Award Winners from CURIN in all Six Categories

1. Consultancy

Dr. Nitin Saluja - Associate Director (Research) and Mr. Varinder Singh – Manager, CURIN were recognized for their industry consultancy titled Design of 3 KW Vacuum Assisted Hybrid Microwave-IR Dryer for Food Drying Application. In this project, they designed a new microwave-IR dryer cavity and simulated it in COMSOL for process optimization.



2. Extramural Funding

Dr. Adarsh Kumar Aggarwal - Vice President, Chitkara Innovation Incubator Foundation (CIIF), Mr. Sagar Juneja – Assistant Dean, Research, CURIN, and Dr. Neeraj Kumar - Associate Professor & Incubation Manager, CIIF were the top award winners from CURIN in this category.



Dr. Adarsh and Dr. Neeraj were awarded for bringing Government of India (GoI) grants under the schemes of Nidhi Prayas, MeitY TIDE 2.0 and Startup India Seed Fund to Chitkara University.

Mr. Sagar was awarded for bagging GoI funded projects namely NewGen IEDC, Technology Enabling Centre and STEM Demonstration and Popularization.

3. Patents

Dr. Shefali Gupta and Dr. Rupesh Gupta – Professors, CURIN, were ranked second in this award category, as three patents each were granted to them by the Indian Patent Office in the year 2022. Mr. Sagar Juneja - Assistant Dean, Research, CURIN, was ranked third in the category for his two patents that were granted to him in 2022.

Notably, Dr. Shefali and Dr. Rupesh have filed a total of 70 patents till date out of which 10 have been granted. Mr. Sagar has filed 27 patents out of which 7 have been granted.



4. Publications

- Dr. Shalli Rani – Professor, CURIN was the top researcher from CURIN who received maximum cash incentive in the Excellence Awards function. Dr. Shalli is a prominent researcher in Chitkara University. She is continuously winning the best researcher award for the past 5 years. She has published 50+ papers in Scopus/SCI indexed Journals, Conferences, and Book Chapters. She has an h-index of 20 and i10-index of 41. She is among the top 2% scientists of the world as per the Stanford list. She has also edited a special issue for IEEE Transactions on Industrial Informatics. Similarly, Dr. Amit Mittal - Pro-Vice Chancellor (Research Programs), CURIN and Dr. Arun Aggarwal - Assistant Professor, Doctoral Research Centre, Chitkara Business School, CURIN were the top two researchers from Business School.



- Dr. Shalli Rani along with her team mate, Dr. Himanshi Babbar – Assistant Professor, CURIN, were also recognized in the Publication by Quality sub-category for publishing in IEEE Transactions on Industrial Informatics (Impact Factor: 11.39), IEEE Wireless Communications Magazine (IF : 11.6) and Scientific Reports, Nature (H- Index: 242).



In the same sub-category of Publication by Quality, Dr. Rahul Pandey, Dr. Jaya Madan – Assistant Professors, CURIN and Ms. Savita Kashyap – PhD Scholar, were awarded for publishing their research work in Chemical Physics Letters (H-Index: 240). Their paper was titled “The influence of top electrode work function on the performance of methylammonium lead iodide based perovskite solar cells having various electron transport layers”.

- Dr. Jaya Madan is also among the top 2% scientists of the world as per the Stanford list. Similarly, two more researchers from CURIN (total 4) were also recognized for being in this coveted list, including Dr. Manish Sharma – Professor, CURIN and Dr. Deepam Goyal – Assistant Professor, CURIN in addition to Dr. Shalli and Dr. Jaya.



- In another sub-category under Publications titled Most Cited Papers, Dr. Jyotsna Kaushal – Professor, CURIN was awarded for her research paper titled “An extensive review on the consequences of chemical pesticides on human health and environment”, which has been published in the Journal of Cleaner Production, and it has already received 388 citations in a very short duration of just 2 years. The review was conceptualized when it was observed that the devastating effect of pesticides in Punjab is resulting in high percentage of cancer patients (90 patients for every 100,000 people of the state, when the national average is 80). Today, it is really important to save the soil, water and air for our next generation from the adverse effect of pesticides to prevent deadly disease, like cancer.
- Four PhD scholars from CURIN were among the top 10 research scholars of the university who received maximum cash incentives for their publications. These scholars were Diksha, Savita Kashyap, Ankit Rai Dogra and Vatsala Anand.



5. Guiding Doctoral Research

In this award category, Best Phd supervisors in Engineering were awarded from CURIN, and they were Dr. Shalli Rani and Dr. Deepali Gupta – Professors, CURIN. In the same category, Dr. Urvashi Tandon – Associate Professor and Dr. Arun Aggarwal – Assistant Professor, Doctoral Research Centre, Chitkara Business School, CURIN were the award winners from the Business School.



6. Entrepreneurship

In this award category, founders of faculty start-ups, who have received grants and recognition in the year 2022 were awarded. Chitkara University has more than 30 faculty start-ups. The award winners from CURIN in this category included - 6DOF Solutions Pvt. Ltd. (Dr. Neha Tuli – Assistant Professor and Mr. Shivam Sharma – Project Manager), and 80Wash LLP (Mr. Varinder Singh).



Notable Achievements of CURIN in Q1, 2023

Awards, Recognition, Citations, etc.

First Prize Won by an Emerging Faculty Startup

6DOF Solutions Pvt. Ltd., a faculty startup headed by Dr. Neha Tuli and Mr. Shivam Sharma from CURIN won the first prize and cash award of INR 50,000 in the Punjab' Emerging Startup IMPunjab Bootcamp that was organized at the Innovation Mission Punjab office in March 2023. 6DOF Solutions works in the area of developing immersive technology solutions for education sector.



Third Prize in the National Level Competition on Cyber Security

A team comprising of Dr. Sudesh K Mittal, Dr. K. R. Ramkumar (Professors, CURIN), Dr. Amanpreet Kaur (Assistant Professor, CURIN), Dr. Bhupendra Singh and Taniya Hasija won third prize in the event entitled Cybersecurity R&D and Innovation Roadshow 2023 that was organized by the Data Security Council of India and National Centre of Excellence for Cyber Security during February 2-3, 2023. The team received a cash reward of INR 10,000 for winning third prize in the competition that witnessed participation from over 100 teams.



Outstanding Reviewer Award

Dr. Ayush Dogra – Assistant Professor, CURIN received an outstanding reviewer award from Bentham Science Publishers for reviewing 1147 manuscripts in more than 130 journals. He has been recognised as one of the top reviewers worldwide in the fields of engineering, computer science, and cross-disciplinary research.

Similarly, an international journal entitled Applied Ceramic Technology having an Impact Factor of 2.328 has recognized Dr. Rakesh Goyal – Associate Professor, CURIN for reviewing a manuscript of a research article.

Exceptional Research from VLSI Centre of Excellence has been highlighted by PV Magazine

A distinguished, PV Magazine has published a featured article on research work being carried out by the team of researchers comprising Dr. Rahul Pandey, Dr. Jaya Madan (Assistant Professors, CURIN) and Mr. Nikhil Shrivastav (Phd Scholar) in the area of Perovskite-CIGS Tandem Solar Cell Design. Published in February 2023, the design carried out by



this research group from the VLSI Centre of Excellence, CURIN offers a promising efficiency of 29.7%.

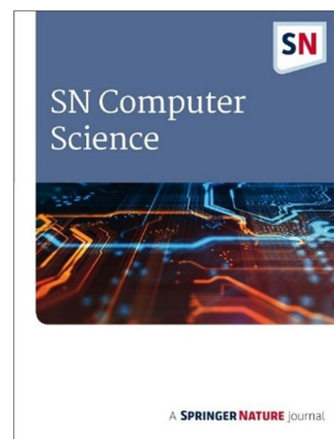
Visiting Professor Invitation

Dr. Arun Upmanyu – Professor, CURIN was invited to the Institut Teknologi Sepuluh Nopember University, Surabaya, Indonesia as a visiting professor under their Global Learning Program (GLP 2023) in March 2023. He taught two courses to the first year engineering students of International Undergraduate Engineering Program. These courses were titled ‘Electric Potential and its Applications’ and ‘Basics of Integration’. He also did sessions with the high school teachers of Indonesia on the topic Creative & Innovative Learning in STEM Courses.



Nomination as the Editors/Guest Editors

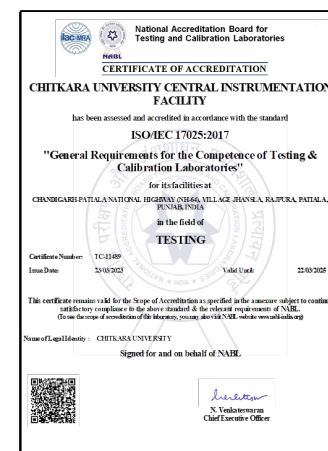
- Dr. Bhisham Sharma - Associate Professor, CURIN has been appointed as an Associate Editor of three SCI indexed journals, including Human-centric Computing and Information Sciences (Impact Factor: 6.558), PLOS One (IF: 3.752) and Journal of Intelligent & Fuzzy Systems (IF: 1.737).
- Dr. Archana Mantri – Vice Chancellor, Chitkara University, Punjab and Mr. Sagar Juneja – Assistant Dean, CURIN are the guest editors of the topical issue entitled Diverse Applications in Computing, Analytics and Networks. It is going to be published by Springer Nature in SN Computer Science journal. This topical issue is going to provide an opportunity to the authors of the 3rd International Conference on Computing, Analytics and Networks (ICAN 2022) to publish their extended papers in it. The proceedings of ICAN 2022 has been published by IEEE on IEEE Xplore. Dr. Archana Mantri and Mr. Sagar Juneja were the General Chair and Convener of ICAN 2022, respectively.
- Dr. Ankit Sharma – Assistant Professor, CURIN has been nominated as the book series editor of the book entitled Innovations in Smart Manufacturing for Long-term Development and Growth. It is going to be published by CRC Press, Taylor and Francis. The other editors of this book series include Prof. (Dr.) Gursel Alici (University of Wollongong, Australia), Dr. Yu Dong (Curtin University, Perth, Australia) and Dr. Atul Babbar (SGT University, India). It is going to cover topics like automation, design for manufacturing, machine learning, augmented reality, artificial intelligence, IoT, learning, cloud computing, data analysis, edge computing, cyber security, digital twin, sustainable development goals, and additive and subtractive manufacturing.



CUCIF is now NABL Accredited

Chitkara University Central Instrumentation Facility (CUCIF) is now NABL accredited for chemical and biological testing of water samples. CUCIF is established as per ISO/IEC 17025:2017 and follows the quality standard procedures as per the established guidelines of National Accreditation Board for Testing and Calibration Laboratories (NABL).

CUCIF is known for its consultancy services to the scientific industries and research communities. It is a renowned instrumentation facility in Chandigarh (UT) and States of Punjab and Haryana. CUCIF is also instrumental in offering the services to academia and research institutions in this area to validate their results with precise and advanced measurements with instrumentation facilities. CUCIF has visions to raise the local industries requiring research and innovation to upgrade their products.



Research@CURIN

Top Research Papers of the Quarter by CURIN (Published during January – March 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.

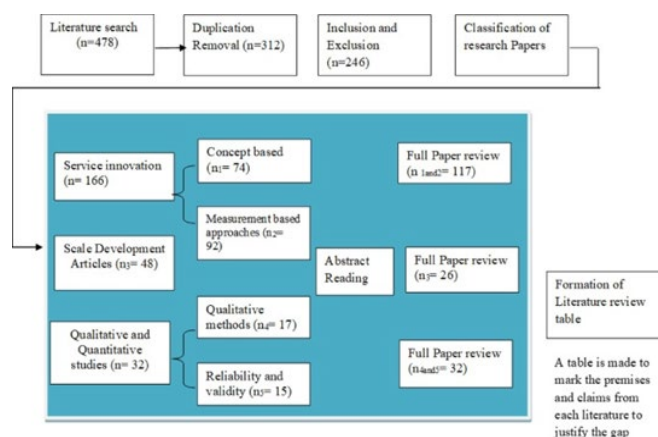
The researcher papers discussed in this issue are the ones that were published during January – March 2023. The complete list of publications by CURIN faculty members and scholars during this period is available in a separate section.

An Insight into the Components of Service Innovation

By: Dr. Sridhar Manohar - Assistant Professor, DRC-CBS

This article is based on the research paper titled 'INNOSERV: Generalized Scale for Perceived Service Innovation' published by Dr. Sridhar Manohar and Dr. Amit Mittal from DRC, CBS, CURIN, Chitkara University, Punjab in Elsevier journal entitled Journal of Business Research.

Recent technological advancements have led to tremendous growth in the service industry, making services easier, more efficient, and productive with appropriate capacity efficiency management. Online delivery applications, BOT and AI for service communication, digital payments, and OTT platforms are some examples of technological advancements that have contributed to this growth. Customers are increasingly demanding personalized and customized services for convenience and experience rather than just a product, particularly in the travel, wellness, tourism, and retail sectors. The service sector is set to account for the largest share of global GDP (65.5%) and employment (47.6%) by 2022, with growth comparatively higher than other sectors in many emerging economies.



The illustration has been borrowed from the published paper

Innovation in services is a key requirement for customers, but service industries differ from one another in terms of nature, characteristics, and requirements. Service innovation requires detailed conceptualization, techniques for adaptation, and different approaches than product innovation. Service and service-based companies are more inclined towards non-technological innovation than manufacturing companies. A need arises to study organization and commercial innovation along with technological components in measuring service innovation (INNOSERV scale), for which existing literature does not provide a generalized scale across service sectors.

The INNOSERV scale helps managers and researchers in the service domain understand how customers perceive or expect innovations that are commercialized in the market. It has seven typologies that measure the perception towards service innovation, including core service/offerings, peripheral services, process innovation, peripheral process, non-technological innovations, strategic innovations, and communication medium. This study emphasizes that innovation need not be completely new; something that may be existing in the same industry or sector but offered by the firm for the first time to its customer must be considered as innovation. Managers and researchers must also understand that when it comes to services, equal importance has to be given to both technological and non-technological components.

Comprehensive Understanding of the Complex Relationship between Diet and Health for Personalized Nutrition

By: Dr. Varsha Singh - Assistant Professor, CURIN

This article is based on the research paper titled 'Current Challenges and Future Implications of Exploiting the OMICS Data into Nutrigenetics and Nutrigenomics for Personalized Diagnosis and Nutrition', published by Dr. Varsha Singh from CURIN, Chitkara University, Punjab, India in Elsevier journal entitled Nutrition.

In recent years, the field of nutrigenetics and nutrigenomics has gained increasing attention in the scientific community. The integration of genes, proteins, and metabolism with nutritional sciences has opened up new possibilities for personalized nutrition and diagnosis. This interdisciplinary field is commonly referred to as 'omics' and offers a more comprehensive understanding of the complex relationship between diet and health. However, exploiting omics data in nutrigenetics and nutrigenomics presents several challenges, and its future implications are still uncertain.

One of the primary challenges in using omics data in personalized nutrition is the complexity of the data itself. Omics data typically includes vast amounts of information, such as genetic variation, gene expression, and metabolic profiles. Integrating and interpreting this data in a clinically relevant manner requires sophisticated analytical tools and expertise. Moreover, the data generated by omics technologies are often noisy, and the results are subject to bias and errors. Therefore, the accuracy and reliability of 'omics' data remain a significant challenge for personalized nutrition.

Another significant challenge in the field of nutrigenetics and nutrigenomics is the lack of standardized protocols and guidelines for data collection and analysis. Inconsistencies in data collection and analysis can lead to significant variability in results, making it difficult to compare and interpret findings across different studies. The lack of standardization also hampers the development of clinically relevant biomarkers and diagnostic tools for personalized nutrition.

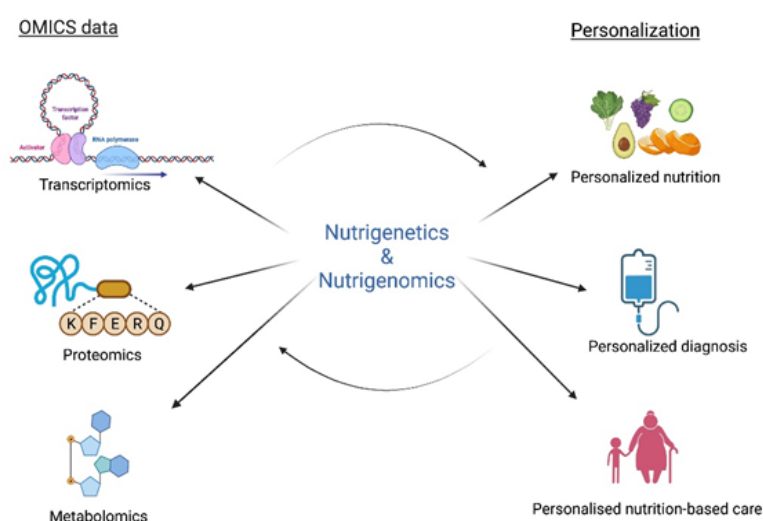
Furthermore, the ethical and legal considerations of using omics data in personalized nutrition and diagnosis remain a challenge. The use of genetic

information for personalized nutrition raises concerns about privacy and confidentiality. Additionally, there are concerns about the potential for discrimination based on genetic information. As the field of nutrigenetics and nutrigenomics continues to evolve, it is essential to establish guidelines and regulations that protect individuals' privacy and prevent discrimination based on genetic information.

Despite these challenges, the future implications of exploiting omics data in nutrigenetics and nutrigenomics are vast. Personalized nutrition has the potential to revolutionize the way we approach health and wellness. By tailoring nutrition-based care to an individual's genetic makeup, we can improve health outcomes and prevent chronic diseases. Moreover, personalized nutrition can improve the efficacy of clinical interventions, reduce healthcare costs, and enhance patient satisfaction.

To realize the full potential of personalized nutrition, the field of nutrigenetics and nutrigenomics needs to address the challenges mentioned above. Standardization of data collection and analysis, development of clinically relevant biomarkers, and guidelines for ethical and legal considerations are essential for advancing the field. Furthermore, collaborations between different disciplines, such as nutrition, genetics, and bioinformatics, are necessary for developing comprehensive and integrated approaches to personalized nutrition.

In conclusion, the integration of omics data in nutrigenetics and nutrigenomics presents several challenges and opportunities for personalized nutrition. The complexity and variability of 'omics' data, lack of standardization, and ethical considerations are significant hurdles to overcome. However, if these challenges can be addressed, personalized nutrition has the potential to improve health outcomes and revolutionize the way we approach healthcare.



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Conversion Efficiency of over 30% has been achieved with Non-Toxic Perovskite-Silicon Tandem Solar Cells

By: Dr. Jaya Madan - Assistant Professor, CURIN

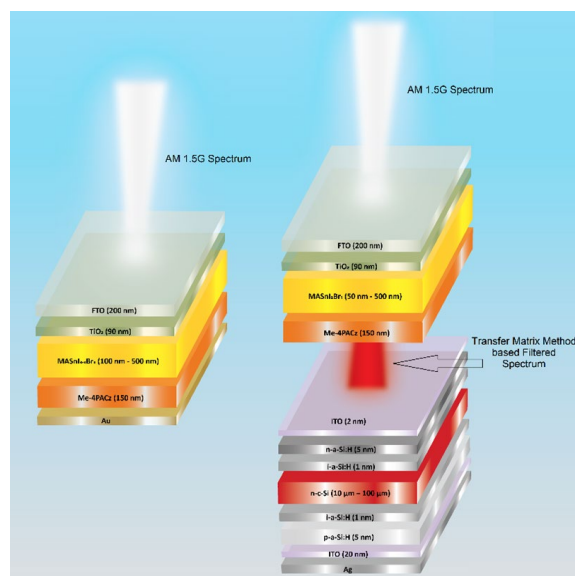
This article is based on the research paper titled ‘Halide Composition Engineered Non-Toxic Perovskite-Silicon Tandem Solar Cell with 30.7% Conversion Efficiency’ published by Dr. Rahul Pandey, Dr. Kulbhushan Sharma and Dr. Jaya Madan from CURIN, Chitkara University, Punjab in American Chemical Society journal entitled ACS Applied Electronic Materials.

The world is continuously seeking sustainable and renewable energy sources, and solar energy is a particularly abundant and accessible alternative. However, the efficiency of solar cells has been a significant hurdle in adopting solar energy as a primary source of power. Conventional solar cells made of silicon have a conversion efficiency of 26.7%, which has reached its highest limits. This fact is prompting researchers to investigate new materials and designs to improve the efficiency of solar cells. One such promising alternative is perovskite-silicon tandem solar cell. Perovskite is a relatively new material that shows great potential as a photovoltaic material. These cells have the potential to surpass the efficiency limit of conventional silicon solar cells. However, perovskite has some drawbacks, such as the presence of lead and its instability, which hinder their large-scale implementation in the photovoltaic industry.

To address these limitations, researchers are exploring ways to replace lead with non-toxic materials in perovskite top cells to design non-toxic perovskite-silicon tandem solar cells. Along the same lines, a team of researchers from the VLSI Centre of Excellence, CURIN comprising Dr. Rahul Pandey, Dr. Kulbhushan Sharma, and Dr. Jaya Madan have investigated the use of methylammonium tin mixed halide (MASnI₃-xBr_x)-based materials as a replacement for lead in perovskite top cells. They carried out a comprehensive investigation and optimization of the MASnI₃-xBr_x-based materials with respect to different halide compositions, absorber layer thickness, and bulk defect density in standalone configurations. They then developed a lead-free MASnI₃2Br1-Si-based tandem solar cell using the transfer matrix method and current matching techniques. The tandem solar cell showed a maximum conversion efficiency of 30.7% with an open circuit voltage (VOC) of 2.14 V.

The study has provided important insights into the development of non-toxic perovskite-silicon tandem solar cells. The use of $\text{MASnI}_3\text{-xBr}_x$ -based materials as a replacement for lead in perovskite top cells has shown great promise. The optimized materials have shown good stability and high efficiency in standalone configurations, which is a positive indication for their use in tandem solar cells.

The results of the study have implications for the photovoltaic industry, as non-toxic perovskite-silicon tandem solar cells have the potential to surpass the efficiency limits of traditional silicon-based solar cells. The study paves the way for the progress of highly efficient, non-toxic perovskite-silicon tandem solar cells, which could significantly contribute to the global shift towards clean energy.



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Predication/Identification of Disease in Paddy Crop using an Artificial Intelligence based Method

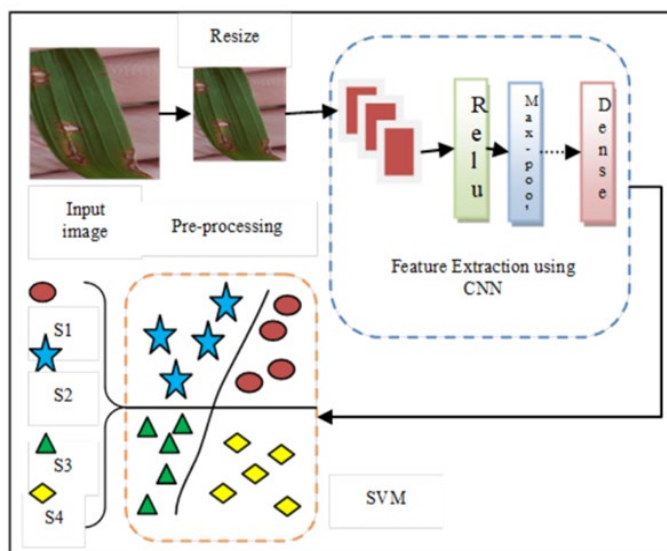
By: Dr. Vinay Kukreja - Professor, CURIN

This article is based on the research paper titled ‘A Novel Hybrid Severity Prediction Model for Blast Paddy Disease Using Machine Learning’ published by Dr. Vinay Kukreja and Dr. Shalli Rani from CURIN, Chitkara University, Punjab in MDPI journal entitled Sustainability.

Authors of this study have proposed a hybrid prediction model for anticipating the severity of blast disease in paddy crop by analyzing images of the infected plants. This approach can help in the early stage detection and prevention of the spread of contamination throughout the field. The proposed model for detecting the severity of rice blast disease can be broken down into four key components. First, the dataset is gathered and arranged based on various levels of disease severity by utilizing knowledge of the experts. The dataset used for the study was obtained from both primary and secondary sources, including Mendeley, Kaggle, GitHub, and UCI. While 1679 images were obtained from

secondary sources, 152 were obtained from primary sources. Second, the images are pre-processed and labelled based on their severity levels, and divided into testing and training datasets. Third component involves extracting features from the images using the Convolutional Neural Network (CNN) method and classifying them using the Support Vector Machine (SVM) approach. Finally, the model is trained and tested.

Four levels of severity have been evaluated based on the extent of the disease affecting the plant's area. These levels include moderate – 0 to 25%, average – 26 to 50%, severe – 51 to 75%, and profound – 76 to 100%. The proposed classifier (which is a hybrid model) in this study has an accuracy of 97% in detecting the blast disease severity levels and it offers several advantages including the automatic extraction of prominent features that eliminates the manual process. Additionally, the model combines the strengths of both SVMs and CNNs, two of the most popular and widely used image recognition classifiers. Such type of hybrid models may be used in detecting other diseases in paddy crop as well as diseases in other plants to minimize losses in the crop yield.



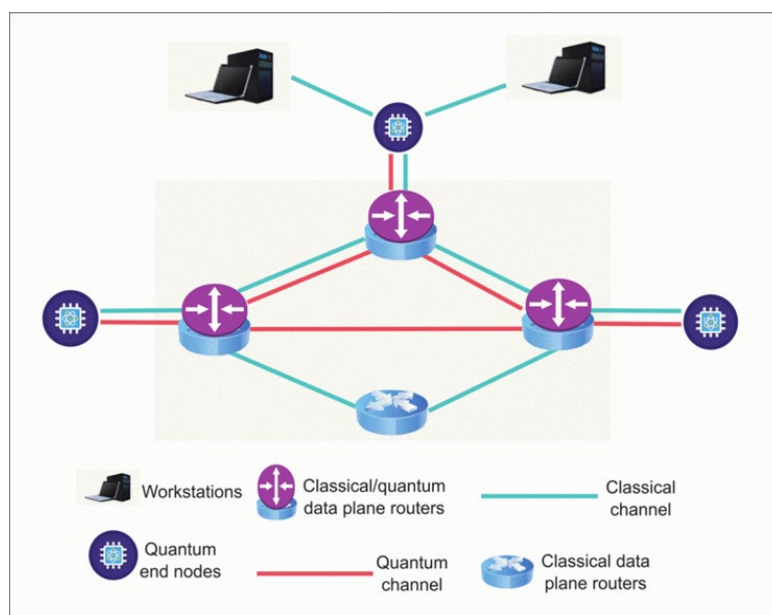
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Security in Quantum Networks

By: Dr. Shalli Rani - Professor, CURIN

This article is based on the research paper titled 'HLSAQ: Hybrid Security Model for Quantum Networks' published by Dr. Shalli Rani from CURIN, Chitkara University, Punjab in IEEE journal entitled IEEE Network Magazine.

The concept of a quantum internet aims to establish a technology that permits quantum communication between any two locations across the globe. While numerous quantum networks have been proposed theoretically, their practical implementation is still distant. Nevertheless, security is an essential aspect that cannot be overlooked, as it has always been critical in any network or device. This article proposes a classical/quantum hybrid network and suggests utilizing a classical layered architecture to enhance security in quantum networks. A hybrid layered security architecture has been recommended for a comprehensive quantum network to manage security requirements and address some of the challenges associated with it. It also addresses outstanding problems in constructing a quantum network on a large scale while providing details on security measures in the immediate future. In the present article, a new architecture is proposed and compared with the other state of art hybrid approaches to show the benefit of proposed hybrid model. To further enhance the security, quantum walks, quantum key distribution and string matching algorithms can be applied with other techniques. As quantum networks offer a potential solution to NP-hard problems that are seemingly unsolvable using classical networks, the significance of security is just as critical as communication in such networks. The proposed layered architecture put forth in this article has the potential to serve as a model for both classical and quantum networks.



The illustration has been borrowed from the published paper

Chitkara University Organized the Biggest Industry-Academia Conclave of the Region

To promote collaborations for joint development of technologies

Chitkara University Technology Enabling Centre (CU-TEC) set-up and sponsored by the Department of Science and Technology (DST), Government of India organized the biggest industry-academia conclave of the region on March 4, 2023. The conclave was held at Chitkara University, Rajpura, Punjab and it was organized in collaboration with the Patiala Chamber of Industries. In this event, a large number of regional industries as well as academic institutions came together with just one objective in mind, i.e. to jointly develop technologies which can be commercialized.

Dr. Krishna Kant Pulicherla - Scientist, TDT Division, DST, New Delhi, who is responsible for smooth and efficient functioning of Technology Enabling Centres (TECs) set-up by the DST across India, participated in this conclave. During his address, he gave insights into various funding schemes wherein industry-academia partnerships are preferred, and industry contributions are greatly valued while evaluating the funding proposals. Director of MSME Development Institute, Ludhiana - Mr. Virinder Sharma stressed upon the need for industry-academia collaborations in solving various real world problems faced by the MSME industries. Mr. J. S. Sandhu - President, Patiala Chamber of Industries and Owner, Champion Engineering Industries also mentioned that the MSME industries have a lot of areas wherein they can collaborate with academia for jointly developing solutions for a variety of problems.

The conclave was attended by over 120 delegates from industry and academia combined. More than 25 regional industries participated with a large chunk of participation coming in from four industry associations including Patiala Chamber of Industries, Sangrur District Industrial Chamber - Block Sangrur, Ambala Scientific Instruments Manufacturing Association, and Panchkula Chamber of Commerce and Industries. Similarly, a large number of academic and research institutions of the region including CSIO-CSIR Chandigarh, NIT Jalandhar, PTU, GNA University, Desh Bhagat University, CT University, Gulzar Group of Institutes, Guru Nanak Dev Engineering College, Baba Banda Singh Bahadur Engineering College, Sri Guru Granth Sahib World University, Punjabi University, etc. also participated.

Representatives of the industries shared different problem statements for which they were ready to collaborate with



academia for finding and building solutions. There were a total of 13 presentations from different industries on topics ranging from corrosion issues in boilers and heat exchangers, battery management systems, improving shelf life of gluten free bakery, cost effective DC motors for gym equipment, etc.

Representatives from academia discussed their technologies, which they wanted to commercialize with support from industry. There were 18 presentations in this segment, 9 were from Chitkara University and 9 were from other academic institutions. Notably, Chitkara University has developed and commercialized many technologies, and more than 25 technologies developed by Chitkara University are currently ready for commercialization.



The conclave also witnessed a panel discussion on the topic 'Industry-Academia Collaborations for Joint Development of Technologies - Need, Opportunities and Challenges' and the panelists were Mr. J. S. Sandhu (President, Patiala Chamber of Industries), Mr. Virinder Sharma (Director, IEDS, MSME Development Institute, Ludhiana) and Dr. Amit Mittal (Pro-VC, Research Programs, Chitkara University, Punjab).

Another highlight of the conclave was the unveiling of NOVATE+ 2023, the 5th edition of the annual hackathon of Chitkara University, which is going to support 10 industry-academia joint projects with funding of INR 250,000 each for the development of prototypes. Dr. Amit Mittal gave a detailed overview of NOVATE+ to the delegates after the unveiling and highlighted in impact NOVATE+ has created in the last few years.

This industry-academia conclave was convened by Mr. Sagar Juneja – Assistant Dean (Research), Chitkara University, Punjab and the Coordinator, CU-TEC. During his welcome address, he shared with the delegates how Chitkara University ecosystem offers diverse collaboration opportunities for industries in working on cutting edge research problems, IPR awareness and protection, incubation support to start-ups and handholding them through GoI sponsored schemes, by offering NABL accredited trust-worthy testing facility, focused program on supporting industries in getting DSIR certification and offering consultancy in different competencies including Engineering, Management, Pharmacy, Mass Communication, Architecture and so on.

As an outcome of this industry-academia conclave, a compendium has been prepared that includes the problem statements from the industries as well as technologies developed in the institutions' labs. This compendium is available on www.chitkara.edu.in/tec.

Forging alliance with industry leaders – Tynor Orthotics Pvt. Ltd., Punjab

CURIN constantly endeavors to join hands with other departments and reaches out to industry to offer technology driven solutions. Bringing together CURIN, CSE, ECE, CSHS and Mechatronics to present 4 projects worth more than INR 10 million, Dr PK Khosla, Pro Vice-Chancellor, CURIN provided technology driven solutions for problems faced by industry.

Stepping towards collaboration, industry tycoon Dr. P J Singh - CMD, Tynor Orthotics Pvt. Ltd. cum Chairman, CII Punjab visited Chitkara University on January 5 to review the AI-Mechatronics & Computer Vision based proposed projects. These projects have been accepted by Tynor for thread bare discussions at the next level. Dr Madhu Chitkara – Pro-Chancellor, Chitkara University and Mr. Mohit Chitkara – Vice President, Chitkara University extended warm greetings to Dr. P J Singh during his visit to the university campus.



Events Organized Under Various Government Schemes and Initiatives

STEM (NCSTC), STI Hub (DST), PSCST, etc.

1. Chitkara University has a Gol funded project of Science, Technology, Engineering and Mathematics (STEM) demonstration and popularization from the National Council for Science and Technology Communication (NCSTC) division of the Department of Science and Technology (DST). Dr. Archana Mantri – VC, Chitkara University, Punjab and Sagar Juneja – Assistant Dean, CURIN are the PI and Co-PI of this two-year project, respectively. In Q1 2023, following activities were carried out under this project.

- On January 23, two seminars were conducted at The Gurukul School, Zirakpur that were delivered by Dr. Rakesh Goyal - Associate Professor, CURIN and Dr. Jyotsna Kaushal – Professor, CURIN. Dr. Goyal's talk was titled "Energy Conservative & its Innovative Applications" and Dr. Kaushal's talk was titled "What Role do Science and Technology Play in Solving Societal Problems?" These seminars were attended by over 100 students from classes 7 to 11. In the same school, one more session was held on January 25 that was delivered by Dr. Satyam K. Agrawal – Professor, CURIN. It was titled "Science for the Budding Scientists."
- On January 30, Dr. Bhanu Sharma (Assistant Professor, CURIN) conducted an exciting tutorial on the topic "A Deep Insight into Immersive Technologies and Innovation: A New Digital Reality" at the Angels Valley School, Rajpura. She gave insights into the latest trends & innovations in immersive technologies to school students. Over 60 students attended this tutorial.

On January 31, two sessions were held in 2 different schools of Rajpura. One was the tutorial session, which was conducted at the Delhi Public School by Dr. Amit Kumar (Assistant Professor, ECE, Chitkara University) on the topic "Innovative STEM Education: Nurturing the Next Generation Innovators". In this tutorial, Dr. Amit demonstrated how to build Arduino-based projects from scratch, and this session was attended by around 60 students and 3 faculty members. The second event was an awareness session that was held at The Humming Birds School



and was conducted by Dr. Rajesh Kaushal (Professor, CURIN) and Dr. Naveen Kumar (Associate Professor, CURIN) on the topic “Basic Understanding of Blockchain & Internet of Things”. It was attended by around 70 students. In the same school, Dr. Satyam K. Agrawal – Professor CURIN, conducted a seminar on the topic “Basics of Science for the Budding Scientists”. It was held on February 10.

- On February 6, two seminars were conducted in St Attri Senior Secondary Public School, Lalru Mandi that were attended by students of classes 8, 9, and 11. One each of these seminars was delivered by Dr. Reetu Malhotra (Professor, Applied Sciences, Chitkara University) and Dr. Pooja Mahajan (Associate Professor, Applied Sciences, Chitkara University). Dr. Reetu delivered a talk on the topic “Fascinating Concepts of Science, Maths, Engineering, and Technology with Examples of Practical Applications in the Real World” and Dr. Pooja spoke on the topic “Emerging Sustainable Technologies”. On February 17, Dr. Arun Upmanyu (Professor, CURIN) delivered a talk that was titled “Role of Science & Technology in Solving Societal Problems”. Around 70 students attended these three sessions.
- During February 9-10, two seminars were organized at the VB International School. The first seminar was on the topic “Eyes in the Sky: Concept Development”, wherein students learned the concept of rocket launching, and working and types of satellites. It was delivered by an industry expert, Mr. Deepak Nair and was attended by around 60 students and 3 staff members. The second seminar that was titled “Fascinating Concepts of Science, Maths, Engineering, and Technology with Examples of Practical Applications in the Real World” and it was delivered by Dr. Varsha Singh (Assistant Professor, CURIN).

2. CURIN conducted two workshops in collaborations with Punjab State Council for Science and Technology (PSCST), Chandigarh

- A three-day faculty development program for the skill enhancement of the teachers was conducted from 13th to 15th February under the project “Awareness and Training Program for Teachers on Teaching Mathematics Through Origami” which was catalyzed by NCSTC, DST. Dr. Kalpna Guleria – Associate Professor, CURIN is the Principal Investigator of this funded project. The FDP was inaugurated by Prof. (Dr.) S. N. Panda Executive Director - Research, Chitkara University, Punjab. Sh. V.S.S. Sastry, the winner of the Limca book of Records -2012 Origami, was the resource person of the FDP. He illustrated various mathematical concepts through origami models, which included the visualization of Pythagoras theorem, obtuse and acute angles, quadratic equations, conceptualization of various mathematical formulas, number sets, Platonic solids: tetrahedron, octahedron, hexahedron, dodecahedron, icosahedron. He also illustrated the basis behind algebraic formulas through origami models by demonstrating their conceptualization during the program that was attended by more than 50 faculty members.
- One-day workshop on “Intelligence Building and Memory Boosting” for the Government school students of Rajpura Block was conducted on March 6, 2023. The purpose of the workshop was to give tribute to the Great Indian Mathematician Srinivasa Ramanujan who is also known as ‘The man who knew Infinity’. The workshop was conducted by Dr. Jeetender Kumar – Director, Wisdom of Mind, Hisar, who has vast experience in human intelligence building programs. In this workshop, he trained 100+ school students and teachers on how to use right brain for enhancing the intelligence of



the human brain. He also talked about left vs right brain coordination and master formula of visualization and memory enhancement. Dr. S. N. Panda appraised the students about the Great Indian Mathematician Srinivasa Ramanujan and his achievements. The students also participated in the speech competition on “Importance of Mathematics and Great Indian Mathematicians” with a lot of enthusiasm. The workshop was coordinated by Dr. Kalpna Guleria and Dr. Naveen Kumar - Associate Professors (Research), CURIN.

3. Chitkara University has a DST sponsored Science and Technology Intervention (STI) Hub, which is headed by Dr. Archana Mantri – VC, Chitkara University, Punjab. Under STI-Hub, two training programs were conducted for the school students of nearby villages in Q1 2023.

On February 23, an activity based program on “Latest Technologies and their Applications” was conducted for the students from Mohi Khurd and Thua villages. On March 14, a workshop on “Role of Science and Mathematics in Society” was conducted for students of classes 7 & 8 and the same session was repeated for classes 9 & 10 on March 16 for the school students of Bathonian Khurd Village. From CURIN, Dr. Jyotsna Kaushal, Dr. Satyam K. Agrawal, Dr. Bhanu Sharma, Dr. Naveen Sharma and Dr. Rajesh Kaushal were the resource persons in these programs, and they covered a variety of topics in the field of science and mathematics to incline students toward these subjects.



Other events organized by different groups from CURIN

- Office of PhD Programs, CURIN organized a two-day symposium on “Design of Thesis and Research Report Writing in Microsoft Word” on February 6–7, 2023. It featured full hands-on practice sessions, wherein research scholars learned a lot of tips and techniques to effectively use MS Word for writing their thesis and research reports. The program was coordinated by Dr. Deepali Gupta – Professor, CURIN.
- Chitkara University, being the spoke centre of the Future Skill Programme (a joint initiative of MeitY, Government of India and NASSCOM), organized an awareness session on the courses offered under the Future Skill Programme in collaboration with C-DAC, Mohali. The benefits of Mobile iOS App Development and Digital Marketing courses were articulated to around 250 B.Tech (AI) students. The program was convened by CURIN and it was held on February 20, 2023.
- On March 3, a hands-on session on Cybersecurity and Burp Suite was conducted by CURIN that also featured an expert talk by Dr. PK Khosla, Pro-Vice Chancellor, CURIN, in which he highlighted the importance of cybersecurity. Dr. Sonam Mittal, Assistant Professor, CURIN, delivered a session on the introduction to cyber security, why it is important to protect the sensitive data and how Burp Suite can help to protect the data from various cyber threats. Burp Suite is an integrated platform that is widely used by cyber security professionals to identify vulnerabilities in web applications. Participants were trained on various features of Burp Suite, such as the proxy and scanner, they learned to identify and exploit vulnerabilities in the web applications, intercept and manipulate HTTP traffic, etc.

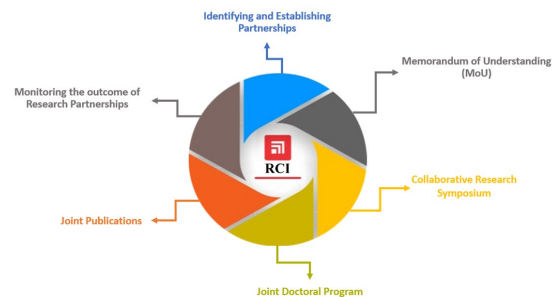


CURIN's Initiative to Promote National and International Research Collaborations

MoUs with eight institutions | Joint doctoral program with Deakin University

By: Dr. Rahul Pandey – Assistant Professor, CURIN and In-charge (Research Partnerships)

In the year 2022 Chitkara University established the Research Collaboration Initiative (RCI), which is a unit of the Office of Research Publications, to build collaborative research partnerships with national and international universities and institutions. The RCI is being led by Dr. Amit Mittal, Pro Vice Chancellor (Research Programs), and his team members include Dr. Rahul Pandey, In-charge (Research Partnerships) and Ms. Namita Sharma, Manager (Research Partnerships).



The vision of RCI is to promote joint research programs and projects, facilitate knowledge transfer and exchange, enhance the research capabilities and international standing of Chitkara University by

building national and international collaborations. The team of RCI has formalised a process to achieve these objectives, which includes identifying potential partners, and reaching out to these partners, drafting Memorandum of Understandings (MoUs), organizing collaborative research symposiums, implementing joint doctoral programs, collaborating on joint publications, and monitoring the outcomes of the research partnerships.

As a result of its efforts, RCI has successfully signed MoUs with eight institutions, formed twenty one research groups, and partnerships with twenty two other institutions are in progress. In addition, RCI organized a research sandpit with Deakin University and secured ten project proposals for the joint doctoral program between Chitkara University and Deakin University. RCI has successfully enrolled three students from Chitkara University in the Chitkara-Deakin joint doctoral program and formed eleven research groups for the Chitkara-Vardhaman joint publication program.

To streamline its research partnership process, RCI has developed standard operating procedures (SoPs) that included identifying potential partner universities, conducting meetings to finalize joint publication and joint doctoral program strategies, utilizing a matching algorithm to identify researchers from both Chitkara University and partner universities, and inviting the identified faculty members to attend a research sandpit.

Chitkara-Vardhaman Research Sandpit

Chitkara-Vardhaman research sandpit was organized on January 20 between Chitkara University and Vardhaman Engineering College, Hyderabad with an aim of building research collaborations. The RCI team comprising of Dr. Amit Mittal, Dr. Rahul Pandey and Namita Sharma headed the initiative from Chitkara University, while from Vardhaman Engineering College it was led by Dr. JVR Ravindra and Dr. J Krishna Chaithanya. Eighteen faculty members from Chitkara University and sixteen from Vardhaman Engineering College attended the meet with objectives of creating interactive thematic sessions collaborations between the faculties with similar research faculties of both institutions and creating opportunities for



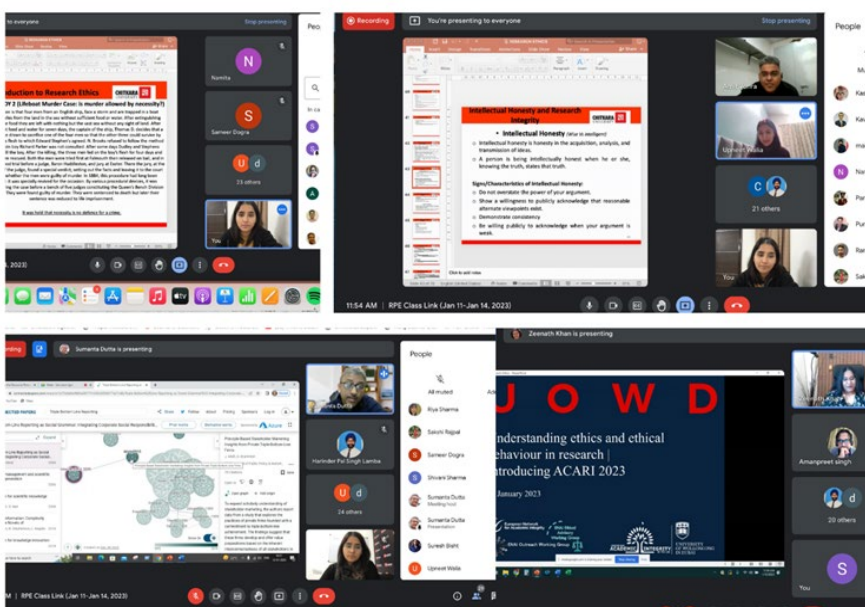
Workshops and Seminars Organized by Doctoral Research Centre (DRC), Chitkara Business School (CBS)

Faculty members from DRC, CBS also delivered invited talks, expert talks, etc.

Five-day Faculty Development Program (FDP) on Research Ethics and Publication Misconduct

DRC, CBS conducted a FDP on Research Ethics and Publication Misconduct during 11-15 January 2023 that was attended by a total of 29 research scholars and faculty members, and was delivered by the faculty members from DRC, CBS including Dr. Sukhpreet Kaur and Dr. Akansha Tyagi. Additionally, two invited sessions were also conducted, and the invited speakers were Dr. Sumanta Datta (Assistant Professor, Post Graduate and Research Department of Commerce, St. Xavier's College, Kolkata) and Dr. Zeenath Reza Khan (Assistant Professor at University of Wollongong, Dubai and Founding President at Centre for Academic Integrity in the UAE).

The participants learned the best practices/standards setting initiatives and ethical guidelines of COPE, WAME etc. Participants were made aware about the unethical behaviour in research publication, violation of publication ethics, authorship and contributorship in research articles, etc. Predatory publishers and journals were also discussed in this FDP. A range of strategies to avoid research misconducts were also discussed in detail. The FDP was designed to encourage the participants, who were in their early stages of research careers, in following the path of ethical research for producing good quality research work.



One-day Seminar on Questionnaire Design using Google Forms

A one-day seminar on Google Forms as a Tool for Questionnaire Designing was organized on March 6 by DRC-CBS, which was delivered by Dr. Niti Chatterjee (Associate Professor, DRC-CBS). It was attended by a total of 28 research scholars and faculty members and it was focussed primarily on the construction and administration of google forms. Dr Niti explained the usage of google forms for collecting data, and participants were given tips to create surveys and questionnaires with different types of question formats. The usage of pictures, video and preparation of several comprehension questions was also discussed in the session.

Five-day FDP on Use of Tools and Techniques in Questionnaire-based Research

A FDP on the Use of Tools and Techniques in Questionnaire-based Research was organized by DRC-CBS in collaboration with the Chitkara School of Health Sciences. The resource persons were Dr. Renu Thakur, Dr. Anita Gupta and Mr. Sachidanand Kulkarni (Chitkara School of Health Sciences) and Dr. Urvashi Tandon (DRC-CBS). It was attended by 39 students and faculty

members. The topics including questionnaire design, validation of questionnaire on various parameters such as construct validity, content validity, face validity, criterion validity, etc. were discussed. Resource persons also gave insights on how to search for different articles in support of the questionnaire to be constructed. The FDP was conducted in groups, wherein seven groups were formed and one mentor was assigned to each group. Other important topics covered in the FDP included outline of a research article/manuscript, how to carry out a literature review, how to use different statistical tools for analysing data, etc.

Invited/Expert Talks Delivered by Faculty Members of DRC, CBS

1. Dr. Amit Mittal (Pro-VC, Research Programs, Chitkara University, Punjab) was invited as a Resource Person at Haryana School of Business, Guru Jambheshwar University, Hisar, Haryana for 15th Annual National Conference on Business and Management that was held during 9-10 February. In his invited talk, Dr. Mittal discussed about quality publishing in top most journals.

Dr. Amit Mittal attended the 2023 QS Higher Ed Summit: Middle East & Africa, which was hosted by The American University of the Middle East, Kuwait during 12-14 March, 2023. Dr. Madhu Chitkara – Pro-Chancellor, Chitkara University and Dr. K.K. Mishra – Director, Chitkara University Accreditation and Quality Assurance Cell also attended this summit.

2. Dr Arun Aggarwal (Assistant Professor, DRC-CBS) delivered a session on Framing of Objectives and Hypotheses - Theoretical / Practical & Selection of Research Design including Sample, Sampling, Data Tools etc. at the Mehar Chand Mahajan College for Women, Chandigarh on 11 February, 2023.

3. Dr. Sridhar Manohar (Assistant Professor, DRC-CBS) conducted a two-day workshop on Advanced Research Tools and Techniques at the Model Institute of Engineering and Technology, J&K during 16-17 February, 2023. He discussed about PLS – SEM and its applicability in research in this workshop, in addition to the other important topics.

4. Dr. Urvashi Tandon (Associate Professor, DRC-CBS) delivered expert sessions in the three-day FDP on Dexterity of Writing a Quality Research Paper. This FDP was organized by the Punjab Institute of Management & Technology, Khanna during February 20-22. She touched upon the topics of questionnaire design and systematic literature review.

Dr. Urvashi also conducted a five-day workshop on Introduction to SPSS for Statistical Analysis, which was organized by the Centre for Global Education, Chitkara University, Punjab from February 27 to March 6. Finally, she was also invited for the first DRC meeting at Parul University, Gujarat on March 14.



Celebration of National Science Day 2023

Chitkara University marked the day with a two-day seminar on Global Science for Global Wellbeing

The National Science Day is celebrated each year to commemorate the discovery of scattering of light by Sir C. V. Raman, in 1928, later called as 'Raman Effect', for which he was awarded Nobel Prize in Physics. Theme-based science communication activities are carried out all over the country on the occasion of National Science Day. The National Science Day 2023 was celebrated by Chitkara University during 27-28 February 2023 as a two-day seminar on "Global Science for Global Wellbeing". The event was organised by CURIN and coordinated by Dr. Satyam Kumar Agrawal, Professor, CURIN.

The event was catalyzed and supported by Punjab State Council for Science & Technology (PSCST) & National Council for Science & Technology Communication (NCSTC), Department of Science & Technology (DST), GoI. More than 100 participants attended the event on both days. The event got wide publicity in news and print media too. Below are the day wise details of the event.

Day 1: 27th February

To start the National Science Day a Poster Making Competition and Declamation Competition was organized. The posters were made and restricted on the theme of the National Science Day 2023. More than 50 students participated and faculty of all disciplines interacted with the students and discussed their thoughts on their posters. Best three posters were identified based on creativity, thought process and presentation and they were awarded. The second event was a Declamation Competition, wherein students from diversified disciplines registered and delivered their speeches in front of audience and jury. This activity was a good way for students to connect and collaborate for knowledge sharing and interdisciplinary exposure.

Day 1 also featured an invited talk by Dr. Tarunpreet Singh Thind - Assistant Professor, Government College for Girls, Ludhiana. He delivered a lecture on "Connecting Traditional Indian Wisdom and Modern Science: Plant Usage for Nutrition and Health". He discussed in detail the importance of Indian system of medicine, phytochemicals, its current applications and need for its use for



global well being. The second session of Day 1 was dedicated to IBSC seminar cum Training. A seminar on biosafety was conducted by Dr. Meenakshi Sood, Director, IEC and Biosafety Officer, IBSC, Chitkara University and Dr. Satyam Kumar Agrawal, Member Secretary, IBSC, Chitkara University. All the internal members of IBSC and scholars working in biosafety attended the session.

Day 2: 28th February

On Day 2, a popular science talk was delivered by Dr. Vikas Khullar - Associate Professor, Department of CSE, Chitkara University, Punjab. He delivered a lecture on "Scope of Artificial Intelligence and Robotics in Mental Health and Wellbeing". He also performed a practical demonstration of the AI tool developed by his research group, which has been developed for facial expression recognition. He explained the emerging role of AI for wellbeing. It was followed with the evaluation of online entries for Science Photography Competition. More than 20 entries were received from students. The best photographs were awarded based on the theme and write-up submitted by the students.

In the closing ceremony, the student participants were given away certificates and awards by Dr. Pankaj Kumar, Professor & Dean (PhD Programme), CURIN. He also addressed the gathering and emphasized on the importance of Global Science for Global Wellbeing.



An Event on World Water Day Organized

World Water Day 2023 - Accelerating Change to Solve the Water & Sanitation Crisis was organized by the Center for Water Sciences (CWS), CURIN on March 22. The scenario of water situation in Punjab and remediation of water contaminants was presented by Dr. Jyotsna Kaushal – Professor, and Head, CWS, CURIN to the school students from Upal Heri village. Students showed keen interest in learning about the water contaminants and various techniques to remediate them. They also participated in a quiz organized on the same theme. PhD scholars from CWS - Shubam and Ajay demonstrated water testing methods to students as well.



17 Student Project Ideas Won Prototype Grant worth INR 27 Lacs in Idea-Thon 2.0

2nd edition of the hackathon held during October 2022 – January 2023

Idea-Thon 2.0 was the 2nd edition of the hackathon that was organized by Chitkara University NewGen IEDC and Chitkara University Technology Enabling Centre (sponsored by Department of Science and Technology, Government of India) during October 2022 – February 2023. The theme of the competition was, Propel Your Innovative Ideas Into Fascinating Reality.

Idea-Thon not only provides funding support to worthy project ideas, but it also offers a lot of hand holding and mentoring support to budding innovators in bringing their project ideas to a level where they can be considered for prototype grant. The submission process for Idea-Thon is very-very simple, and all the applicants receive handholding in formalizing their project ideas. This is a unique feature of this hackathon.

A total of 44 entries were received in the competition in the form of one-minute videos, wherein applicants described their problem statements, solutions, commercial potential and budgetary requirements. All applicants were invited for



an orientation session on January 11 to prepare them for the final presentations round. This session was conducted by Mr. Sagar Juneja (Assistant Dean, CURIN, Coordinator, NewGen IEDC) and Mr. Chanpreet Singh (Project Manager, CURIN).

The final presentations were held over the course of two days, January 20 and 21, and the jury comprised Mr. Deepak Nair (Independent Consultant, Automation & Product Design Expert), Mr. Money Khanna (Project Engineer, Punjab Energy Development Agency), Dr. Sudesh Mittal (Visiting Professor, Chitkara University) & Mr. Sagar Juneja (Assistant Dean, CURIN). Upon carefully evaluating all the project presentations, 17 projects were shortlisted that were awarded prototype grants from NewGen IEDC to develop their project ideas. A total grant of INR 27,72,500 was awarded after scrutinizing the budget presented by each of the shortlisted projects.

Further, to ensure smooth commencement of the shortlisted projects, one-to-one meetings with the winning teams were held on February 6 wherein teams were informed about the deliverables and milestones.

Here are the titles of the 17 projects that have won prototype funding through Idea-Thon 2.0. More details about each of these projects are available on newgeniedc.chitkara.edu.in. A Novel Vacuum Assisted Microwave Reactor for the Production of Biofuel from Biowaste; ADAS based Semi-visibility Accidents Prevention Safety System; AI Drone; Autoclaveable Multipurpose Steel Chamber; Cold Storage Robo; Development of an Augmented Reality App for teaching Healthcare Students; E-bike; Electric Food Plate; Interchangeable Shoe Sole; Life Enhancement of Incinerator Material in Waste Heat Environment; Mechatron; Miniaturized Medical Imaging Lens System for Close Range; Multipurpose Adjustable Sample Collection Trolley; Infection Prevention; PerChins; PTO Operated Mobile Grain Dryer; Smart Saline Sensor; and System for Data Exchange.

Idea-Thon was convened by Mr. Sagar Juneja (Assistant Dean, CURIN and Coordinator, NewGen IEDC) with able support from Mr. Chanpreet Singh (Project Manager, CURIN), Mr. Parul Chawla (Assistant Manager, CURIN) and Mr. Lovit Kumar (Senior Office Executive, CURIN).

Workshop on Startup Valuation Negotiation and Investor Readiness Report

On the occasion of National Startup Day, Chitkara Innovation Incubator organized a workshop on the topic Startup Valuation, Negotiation and Investor Readiness Report. Founders of close to 50 startups as well as budding entrepreneurs attended the workshop.

The speaker for the workshop was Mr. Suman Sengupta - Finance Head, and Professional Services, Lead Angels Network, Mumbai. The speaker talked about the startup valuation strategies, various techniques to value a startup, Do's and Don'ts in startup valuation, etc. He gave real life examples of startups where valuation was based on the face value of the founders. The speaker also talked about the things that investors see while investing in a particular startup. He also gave a short presentation on the investment readiness report in which he shared about the key facts that founders must include while pitching to an investor for possible investment.



CURIN Faculty Members as Resource Persons

Expert Speakers, Invited Speakers, Trainers, Session Chairs, etc.

- Dr. Bhanu Sharma - Assistant Professor, Immersive and Interactive Technology Lab (IITL), CURIN was invited to deliver an expert talk on “Embedded System and Internet of Things (IoT)” at Government Polytechnic, Ambala City, Haryana on January 6, 2023. More than 85 students attended the talk and learned about the immersive technologies and embedded system based applications.



She also delivered an expert talk on “Immersive and Innovative Technologies” on

January 17 for the second and third year BCA students of Chitkara University. The session was organized by Computer Applications Department and it was attended by over 60 students.

- Dr. Ishu Sharma - Assistant Professor, CURIN, chaired a paper presentations session in the 2nd International Conference for Advancement in Technology (ICONAT 2023) that was organized by Rajarambapu Institute of Technology, Maharashtra in collaboration with IEEE Bombay section. A total of 8 papers were presented in this session related to computational intelligence, blockchain, AI, ML, IoT, and cloud computing and it was held on January 24.



In the same conference, Shagun Sharma - research scholar of Dr. Kalpna Guleria - Associate Professor, CURIN, presented her research work. Additionally, two more of her research scholars, Archana Saini and Somya

Srivastav presented their research papers in the 2nd Edition of IEEE Delhi Section Flagship Conference (DELCON 2023) and 10th International Conference on Computing for Sustainable Global Development, respectively.

Dr. Ishu Sharma was invited to deliver an expert talk in the Faculty Development Program on “Cybersecurity Insights: A Practical Approach” on January 31, which was organized by SSN College of Engineering, Chennai. In her talk she discussed about the growing problem of cybercrime that affects individuals, businesses, and governments worldwide. She also discussed about the prevention of cybercrimes in India and other countries. The session was attended by more than 50 participants.

Cyber defenders team of Chitkara University under the leadership of Dr. P.K. Khosla - Pro VC, Research, Chitkara University, organized a session for B.E. CSE students on “ZenTester : For Sure Success in Pentest using Zenmap” on February 13. The session was conducted by Dr. Ishu Sharma. More than 50 students and 10 faculty members

attended the session and learned about the Zenmap tool through hands-on exercises. Participants learned about different types of network scans that Zenmap can perform, role of Pentesters in industry, how open-source tools can help the individuals, etc. Dr P.K. Khosla also shared his expertise on the demand and trend in industry for cybersecurity enthusiasts.

- Dr. Shalli Rani - Professor, CURIN along with Dr. Himanshi Babbar - Assistant Professor, CURIN chaired paper presentations session titled “Emerging Perspectives of Networking & Artificial Intelligence for IoT Applications” in the IEEE International Conference on Intelligent and Innovative Technologies in Computing, Electrical, and Electronics. It was organized BNMIT Bengaluru during 27-28 January 2023.
- Dr. Amanpreet Kaur - Assistant Professor, CURIN delivered a workshop on “R&D and Innovation using Metaverse: Universal and Immersive Virtual World” on March 2. The workshop was organized by the Department of Computer Science and Engineering (Artificial Intelligence), Chitkara University, Punjab, and attended by around 250 students.

She also chaired an online paper presentations session in the 2nd International Conference for Innovation in Technology (INOCON 2023) that was organized by Sai Vidya Institute of Technology, Bengaluru, Karnataka during March 3-5. Ten papers in the fields of artificial intelligence, machine learning, electrical engineering, and data science were presented in the session. In another conference entitled 2nd International Conference on Sustainable Computing and Data Communication Systems (ICSCDS 2023) that was held during March 23-25, Shishir Shrivastava, research scholar of Dr. Amanpreet presented his research work titled “Implementation of an Energy Efficient Flip Flop by using Kintex, Virtex, and Genesys FPGA Families”.

Dr. Amanpreet Kaur was invited by the Department of Nursing, Chitkara School of Health Sciences to share her research experiences with the budding researchers of the department on March 8. The session was organized on International Women's Day 2023 on the theme “DigitALL: Innovation and Technology for Gender Equality”.

- Dr. Naveen Kumar – Associate Professor, CURIN, chaired a paper presentation session in the 5th IEEE International Conference on Emerging Smart Computing & Informatics (ESCI 2023) that was held during March 1-3 and organized by AISSMS Institute of Information Technology, Chitkara University, Punjab acted as an academic partner to the conference and contributed several quality research papers as well as helped the conference organizers in reviewing the manuscripts of the research papers submitted to the conference.

In the same conference, Dr. Shalli Rani – Professor, CURIN, also chaired a session in which papers related to IoT and wireless sensors networks were presented. Additionally, Dr. Ashu Taneja - Associate Professor, CURIN, chaired a session in this conference that featured work related to smart computing solutions for network reliability, security, and management.

- Dr. Arun Upmanyu - Professor, CURIN, delivered a five-day faculty development program on “Design and Writing of Quality Research Paper” during March 16-20. It was organized by the Department of Applied Sciences, Chitkara University, Punjab. The main aim of the FDP was to introduce Mendeley Reference Manager to the participants and explore its applications for creating the library, citing the references in the documents, and creating a bibliography in research papers/thesis. Scholars understood the function of web importer to pick the references from google scholar.

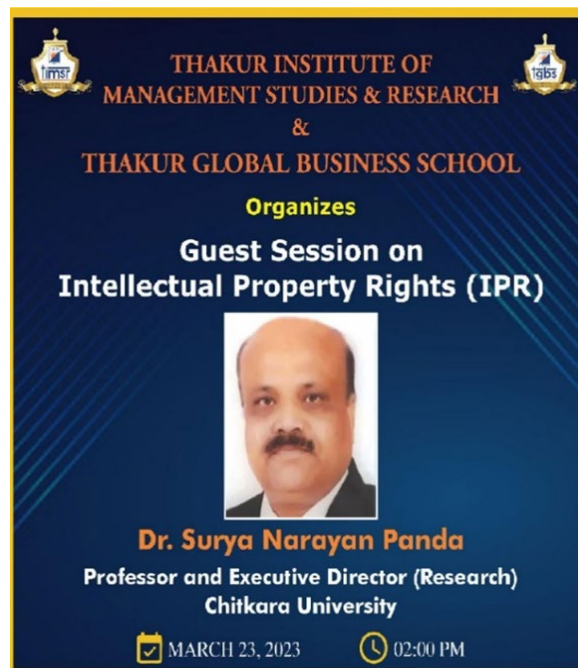


Dr. Arun was invited to chair a session in the 4th International Conference on Recent Advances in Fundamental and Applied Sciences (RAFAS-2023) that was held during March 24-25, and organized by LPU. The focus of the RAFAS 2023 was multidisciplinary that encompassed various research fields of fundamental and applied sciences including Physics, Chemistry, Mathematics, Chemical Engineering and Petroleum Engineering.

- Dr. S.N. Panda - Executive Director (Research), CURIN, conducted an online workshop on Intellectual Property Rights for Thakur Institute of Management Studies and Research, Mumbai on 23rd March 2023. About 110 faculty members of different streams attended the workshop and learned the prior art techniques.

Dr. Panda had also conducted an online workshop on Innovation and Intellectual Property Protection for Bengaluru North University, Bengaluru on 31st March 2023. More than 260 faculty members from all affiliated colleges of Bengaluru North University attended the workshop.

- Dr. PK Khosla - Pro Vice Chancellor, Research, CURIN, was invited as a guest of honor to commemorate the 34th foundation day of the Centre for Development of Advanced Computing (C-DAC) on 22nd March 2023. CDAC is a leading research and development organization in the field of advanced computing in India. During his visit, Dr. Khosla delivered a keynote speech in the presence of Sh. Narendra Nath, Joint Secretary, NSCS, and Director, IIT Jammu. He emphasized the need for India to invest in research and development to keep up with the technological advancements happening globally and he also spoke about the importance of creating a strong ecosystem that fosters innovation and collaboration among academia, industry, and government. In the presence of scientists and researchers in the field of health science, artificial intelligence, cyber security, and computing, he lauded CDAC's efforts in this direction and encouraged them to continue their good work. The CDAC team appreciated the opportunity to interact with such a distinguished guest and was inspired by his words.
- Dr. PK Khosla delivered an insightful keynote address at the AI Summit that was held at Chitkara University on March 23. The topic of his talk was "The Power of AI in Business Transformation", in which he emphasized the need for companies to embrace AI and integrate it into their operations. He spoke about the various ways in which AI can be leveraged, such as in data analytics, predictive modeling, and natural language processing, among others. He also stressed the importance of developing AI-powered solutions that are ethical and transparent, ensuring that the technology benefits society as a whole. Furthermore, Dr. Khosla shared the AI-powered solutions he is currently working on for Industry to facilitate advanced manufacturing.



Forging Collaborations

For Joint Projects, Research, Knowledge Sharing with other Institutions and Industry

- On 11th January 2023, Dr. PK Khosla - Pro Vice-Chancellor, CURIN, visited IIT Madras and Sankara Eye Hospital, Chennai (a leading institution in ophthalmology), to explore opportunities for collaboration and exchange of ideas between Chitkara University and these institutions. The visit will open avenues for working on projects related to biomedical engineering and ophthalmology, which could greatly benefit patients worldwide. Dr. Khosla had the privilege of meeting with the researchers and clinicians at both institutions and learning about the latest advancements in their respective fields. At Sankara Eye Hospital, he gained insights into the pioneering work being done to develop new treatments for eye diseases such as glaucoma and macular degeneration. At IIT Madras, Dr. Khosla interacted with entrepreneurs from the Department of Biomedical Engineering.
- Dr. K.R. Ramkumar - Associate Professor, CURIN and Dr. Amanpreet Kaur - Assistant Professor, CURIN, visited Center of Artificial Intelligence and Robotics (CAIR), DRDO, Bengaluru in January 2023 for progress review of their ongoing project. They demonstrated both the software and hardware implementations of the proposed work. They also got an opportunity to interact with the DRDO Chair and Ex-Director General, CAIR about the possible research collaboration opportunities.
- Officers and trainees from the Indian Air Force (IAF) visited research facilities of CURIN, Chitkara University on 17th February to explore new techniques and technologies to meet the stringent requirements of the defense systems. A team from Immersive and Interactive



Technology Lab (IITL), CURIN demonstrated different projects based on virtual reality, augmented reality, and mixed reality that are designed and developed at Chitkara University. They offered to build a virtual reality based solutions for IAF for the preventive maintenance of the aircrafts. After this visit of the IAF officials, a team from CURIN comprising of Dr. PK Khosla, Pro Vice-Chancellor, CURIN and Dr. Amanpreet Kaur - Assistant Professor, CURIN were invited to the Ambala Air Force Station on March 10, where they studied the cutting-edge VR systems of the most advanced Rafale aircraft.

- Dr. Ayush Dogra - Assistant Professor, CURIN met with Mr. Sanjeev K. Marjara - A.M.D Cum Director, Technical, Allengers Medical Systems Limited, Derabassi, Punjab, on March 11. They discussed the Moiré/Grid line artefact problem that continues in obtaining X-ray scans at various angles. Mr. Marjara outlined numerous procedures to reduce this problem. Also, one set of X-ray modalities contaminated by Moiré artefacts was shared with Dr. Ayush. The objective of this visit was to explore the possibility of developing a solution to the problem that can benefit the consumers.
- Dr. Neha Tuli - Assistant Professor, Immersive and Interactive Technology Lab (IITL), CURIN, along with the other members of IITL including Shivam Sharma and Sanchit Vashisht attended the second meeting of the G20 Education Working Group under India's G20 Presidency on 16th and 17th March at Khalsa College, Amritsar. The event brought together all G20 nations, invited countries and international organizations and centered on strengthening research and promoting innovation through collaboration, building capacities, promoting life-long learning in the context of the future of work and ensuring foundational literacy and numeracy, especially in the context of blended learning.
- Dr. Arun Upmanyu attended a two-day workshop on Radio Chemistry and Applications of Radioisotopes during March 25-26, 2023, which was organized by Sri Guru Gobind Singh College, Sector 26, Chandigarh. This workshop was graced by Dr. S. Khanan, Director, Radiochemistry & Isotope Group and Vice President, IANCAS, Bhabha Atomic Research Centre (BARC). Eminent Speakers from different parts of the country shared valuable scientific information in the workshop.



38 Patents Filed by CURIN Faculty Members and Scholars in Q1, 2023



The Patent Office has Granted
192 Patents
to Chitkara University in Q1, 2023.

A total of 104 patents (including industrial designs) have been filed by different departments of Chitkara University during January - March 2023, out of which 38 have been filed by CURIN faculty members and researchers. The details of these 38 patents are given below.

S. No.	Title	Inventors	Application Number
1	A Novel Method of IoCs Acquisition, Cyber Incident Detection Resulting in Effective Response	Praveen Kumar Khosla, Prabhjot Kaur, Prena Chachra, Navdeep Singh Chahal, Archana Mantri, Priya	202311020558
2	A Novel Protein-based Nano Particles Comprising Cationic-Lipid for Drug Delivery System	Varsha Singh, Vinamrita Singh	202311001817
3	A Pharmaceutical Composition Comprising Allopurinol for Dementia	Amit Kumar, Varinder Singh, Thakur Gurjeet Singh	202311013255
4	An Inventory Management System	Ashu Taneja, Rinku, Arun Lal Srivastav, Harmanpreet Kaur, Ishpreet Kaur	202311002299
5	Acridin Compound for Gram-Negative Bacteria	Pragati Silakari, Manjinder Singh, Varinder Singh, Thakur Gurjeet Singh	202311005298
6	Anti-Bacterial Compound for Gram-Negative Bacteria	Pragati Silakari, Manjinder Singh, Varinder Singh, Thakur Gurjeet Singh	202311005299
7	Automated Umbrella with Full-Body Coverage Sheet	Shalli Rani, Himanshi Babbar	202311014980
8	Balancing Load of a Software-Defined Network using Switch Migration	Himanshi Babbar, Shalli Rani	202311004521
9	Chromen-4-One based Aldose Reductase-2 Inhibitor and Use Thereof	Manjinder Singh, Varinder Singh, Thakur Gurjeet Singh, Ravinder Singh, Pragati Silakari	202311006578
10	DNA Vaccine Delivery	Debarshi Ghosh, Nitin K Saluja, Thakur Gurjeet Singh, Gurjinder Singh	202311002072
11	Device for Attending Patients	Gurpartap Singh, Parth Shaktan, Phuntsho Choden, Yeshe Rigtsel Wangchuk, Rupesh Gupta, Sheifali Gupta, Vatsala Anand,	202311020563
12	Dry Herbal Hair Shampoo Composition, and a Method of Preparing Thereof	Ramkumar K R, Sugasini Kr, Lakshmi T.V	202311011779

13	Distributed Ledger-based System for Health Services	Ishu Sharma, Jiya Saini, Jagdeep Sharma	202311017864
14	Equipment for Detecting Emotions, Neurological Dysfunction, and Speech Impairments	Puneet Bawa, Archana Mantri, Shirvi Verma	202311015765
15	Herbal Composition for Skin Care	Ramkumar K R, Sugasini Kr, Lakshmi T.V	202311007865
16	Herbal Hair Care Composition, and a Method of Preparing Thereof	Ramkumar K R, Sugasini Kr, Lakshmi T.V, Sulochana K R	202311019171
17	Internet of Things based Hybrid Fitness Monitoring System and Method	Naveen Kumar, Rajesh Kumar Kaushal, Sanjeev Verma, Rajesh Kumar Dhanaraj, Surya Narayan Panda, Manish Sharma, Poonam Shourie	202311008209
18	Inflatable Fall Protection Garment	Chetan Kandpal, Ankit Kumar Rai, Deepam Goyal, Deepali Gupta, Monica Dutta	202311016529
19	Internet of Things based System for Cattle Identification and Method Thereof	Vikas Khullar, Kirandeep Singh, Vikas Lamba, Veeramanickam Mrm, Harjit Pal Singh, Mohit Angurala, Nitin Goyal	202311013034
20	Multi-Input Multi-Output (MIMO) Antenna for 5G Application	Manish Sharma	202311005639
21	Multifunctional Floor Cleaning Apparatus	Mohit Kumar, Arun Upmanya, Deepam Goyal, Prateek Srivastava, Sanjeev Verma	202311008210
22	Microwave Heating Apparatus	Amanpreet Kaur, Priyanka Datta	202311001488
23	SOS-Enabled Fire Extinguisher	Sanjeev Verma, Naveen Kumar, Rajesh Kumar Kaushal, Surya Narayan Panda, Mohit Kumar, Raman Kumar	202311008817
24	System and Method for Monitoring Crop and Livestock	Heena Wadhwa, Mandeep Kaur, Htet Ne Oo, Leema Nelson	202311014479
25	System for Maternal Monitoring	Sarvesh Tanwar, Medini Gupta, Dimple Nagpal, Surya Narayan Panda, Niranjana Lal	202311000375
26	System for Refrigeration	Ankit Kumar Rai, Chetan Kandpal, Monica Dutta, Deepali Gupta, Deepam Goyal, Nitin Goyal	202311004725
27	System for Automated Shoe Cabinet with an Augmented Reality Mirror	Kanwarpartap Singh Gill, Vatsala Anand, Sheifali Gupta, Rupesh Gupta, Vivek Pahwa	202311002075
28	System for Detection of Fog	Nitin Kumar Saluja, Sakshra Monga, Ashu Taneja, Joyti Gupta, Kamal Gulati	202311003437
29	System for Identification of Neurological Disorders and Speech Impairments	Puneet Bawa, Archana Mantri, Virender Kadyan	202311006582
30	Testing Assembly for Liquid Crystal Display Cells	Vandna Sharma, Pankaj Kumar, Ankit Rai Dogra	202311002080
31	(Un)Substituted Piperazin-1-YL-Chromen-4-One Compound a ALR-2 Inhibitor and their Process of Preparation Thereof	Manjinder Singh, Varinder Singh, Thakur Gurjeet Singh, Ravinder Singh, Pragati Silakri	202311002297
32	UWB Antenna with an Accurate WLAN Notch Band	Rajeev Kumar, Gurpreet Kumar, Renu Popli, Manish Sharma	202311018281
33	10-(2,4-Dichlorobenzyl) Acridin-9(10H)-One for Bacterial Infections	Pragati Silakari, Manjinder Singh, Varinder Singh, Thakur Gurjeet Singh, Amarjot Kaur	202311005300

INDUSTRIAL DESIGN REGISTRATIONS

34. Case for all types of Fruits

By: Amanreet Singh, Amandeep Kaur, Deepali Gupta, Vandana, Rupinder Singh, Maninder Jit Singh Khanna, Jaspreet Singh Bajaj

Application No. 378106-001



37. Mousepad cum Mouse Pouch

By: Varun Jindal, Vinay Kukreja

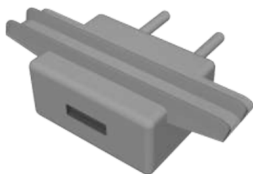
Application No. 382213-001



35. Charger cum Mobile Holder

By: Krishan Dutt Sharma, Bhanu Sharma, Naveen Kumar, Akshita Sharma, Harbani Sharma

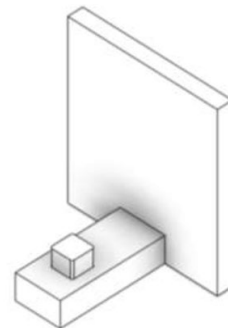
Application No. 380765-001



38. Wall/ Door Hanger Hook with Popup Button

By: Rakesh Goyal, Jaskaran Singh, Punam, Dhawal Goyal

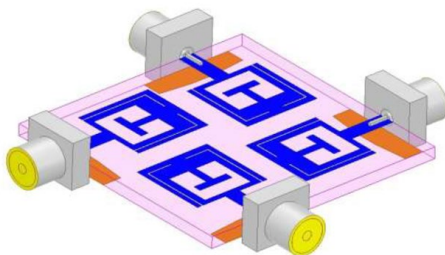
Application No. 378933-001



36. Integrated Bluetooth and UWB Four-Port MIMO Antenna with Band Stop Filters

By: Manish Sharma, Ashwani Kumar, Vaishali Kikan, Gaurika Jaitly, Anusha Dagar, Shreya Singh, Shweta Singh, Nishika Chandra Deo

Application No. 381669-001



List of Publications

107 publications by CURIN that were indexed in
SCI and/or Scopus in Q1, 2023

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- [3] A. Kumar, M. Chitkara, and G. Dhillon, "Effect of Gadolinium Substitution on Structural, Morphological, and Electrical Properties of SnO₂ Thin Films," *Journal of Materials Science: Materials in Electronics*, vol. 34, no. 4, p. 319, 2023.
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