MANAV RACHNA UNIVERSITY

Declared as State Private University vide Haryana Act 26 of 2014

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

SDG 9: INDUSTRY INNOVATION & INFRASTRUCTURE

Progress Report

2023-2024

MANAV RACHNA UNIVERSITY

Established wide Haryana state Legislature Act No 26 of 2014 & under section 2(f) of UGC 1956

Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.

PREAMBLE

WE, THE FACULTY, STAFF, AND STUDENTS OF MANAV RACHNA UNIVERSITY, recognizing the fundamental importance of resilient infrastructure, inclusive and sustainable industrialization, and fostering innovation as core drivers of economic progress and human well-being, hereby affirm our dynamic commitment to the objectives of the United Nations Sustainable Development Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

WHEREAS technological advancement, robust physical and digital infrastructure, and strong industry-academia collaboration are essential for tackling complex societal and environmental challenges;

WHEREAS the institution actively promotes innovation and sustainable industrialization through its dedicated Incubation Centre (MRIC) and Technology Business Incubator (TBI), providing crucial support, mentorship, and resources to translate research ideas into commercially viable, scalable, and socially relevant industrial enterprises;

WHEREAS our commitment to building resilient and sustainable infrastructure is demonstrated by continuous investment in campus facilities, including modern, accessible buildings, advanced laboratories, and a robust Digital Infrastructure that supports high-speed connectivity, remote learning, and data management;

WHEREAS we prioritize scientific research and technological upgrading across all disciplines, ensuring that our outputs, particularly in fields like engineering and smart systems, directly contribute to the modernization of local and regional industry and the creation of valuable Intellectual Property (IP);

NOW, THEREFORE, BE IT RESOLVED that Manav Rachna University shall continue to strengthen its role as an innovation hub, enhancing its collaboration with industry partners, investing in cutting-edge research, and maintaining a physically and digitally resilient campus environment that serves as a living laboratory for sustainable infrastructure solutions, thereby catalyzing inclusive and impactful industrial growth.

Industry, innovation and infrastructure

1. Global Context

Sustainable Development Goal 9 (Industry, Innovation, and Infrastructure) is a pillar of the 2030 Agenda for Sustainable Development, focusing on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation. The main objectives of SDG 9 include:

- **Developing quality, reliable, sustainable, and resilient infrastructure,** including regional and transborder infrastructure, to support economic development and human well-being.
- **Promoting inclusive and sustainable industrialization** and, by 2030, significantly raising industry's share of employment and GDP, in line with national circumstances.
- **Upgrading infrastructure and retrofitting industries** to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.
- **Enhancing scientific research and upgrading technological capabilities-** encouraging innovation through investment in research and development and promoting a skilled workforce.
- **Community Outreach and Capacity Building**: Universities support local communities, small businesses, and entrepreneurs through technical assistance, mentoring, and access to university facilities, fostering industrial growth at the grassroots.

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Manav Rachna University (MRU) fosters industry, innovation, and resilient infrastructure as strategic drivers in its teaching, research, and engagement, thereby aligning deeply with Sustainable Development Goal 9 (SDG 9) through:

- **Curriculum Integration of Industry and Technology:** MRU ensures that curricula across disciplines incorporate emerging technologies, digital skills, and engineering principles relevant to evolving industries. Programs emphasize applied learning, problem-solving, and exposure to advanced manufacturing, smart infrastructure, and sustainable technological solutions.

- **Focused Research and Faculty Expertise:** MRU's research ecosystem prioritizes innovations in sustainable infrastructure, advanced materials, automation, and clean technology. Faculty-led investigations address regional and global industrial challenges, enhance manufacturing competitiveness, and drive advancements in environmentally conscious industrial processes.

- **Student-Led Innovation and Technical Leadership:** Student clubs, innovation groups, and technical competitions provide platforms for leadership, entrepreneurship, and solution development. These activities nurture the creativity and technical skills required to develop new products, scalable startups, and sustainable technologies.

2. University's Vision and Commitment

Manav Rachna University's vision encompasses developing innovative, ethical, and globally responsible citizens equipped to contribute to robust, sustainable industrial ecosystems. The university's strategic focus on SDG 9 is demonstrated by:

- **An enduring commitment to fostering a culture of invention and technical advancement.**
- **Continuous investment in state-of-the-art laboratories, infrastructure, and digital platforms to support learning and societal impact.**
- **Engaging communities and industries in building solutions that address regional development needs, environmental sustainability, and inclusive economic participation.**

2.1 MRU's Strategic Commitment to SDG 9

Manav Rachna University (MRU) is dedicated to accelerating sustainable industrialization, nurturing innovation, and building resilient infrastructure through holistic education, interdisciplinary research, industry collaboration, and community partnerships. This commitment positions MRU as a catalyst for transformative progress, empowering the next generation to drive sustainable industrial breakthroughs and infrastructural excellence for a better, inclusive future.

In line with SDG 9 – Industry, Innovation, and Infrastructure – Manav Rachna University (MRU) places strong emphasis on fostering innovation, driving sustainable industrialization, and building resilient infrastructure among its students, faculty, and stakeholders. MRU recognizes higher education's pivotal role in transforming industries, nurturing technological advancement, and contributing substantially to sustainable economic development at local, national, and global levels.

2.1.2 MRU's strategic initiatives for SDG

9 center on:

- **Encouraging Multidisciplinary Research on Industry and Innovation:**

  MRU promotes collaborative research that addresses challenges in industrial technology, infrastructure systems, and sustainable industrial processes. Faculty and student research initiatives focus on the application of advanced engineering, digital transformation, and clean technology to real-world industrial needs.

- **Embedding Innovation, Technical Skills, and Sustainability in the Curriculum:**

  The university integrates courses and projects on engineering, industry 4.0, entrepreneurship, and sustainable infrastructure across programs. This approach ensures students acquire both technical and leadership skills aligned with the needs of future-ready industries.

Industry, Innovation, and Infrastructure Policy:
Governs the promotion of resilient infrastructure, adoption of innovative industrial practices, and encouragement for technological entrepreneurship among students and faculty.

Technology Development and Industry Partnership Reports:
Promote ongoing assessment and enhancement of innovation readiness, technical skill development, and collaborative projects with industry leaders to improve industrial relevance and infrastructure standards.

Academic Policy:
Integrates innovation, industrial design thinking, emerging technologies, and sustainability concepts into both technical and non-technical programs, fostering skills for advanced industry roles.

Research and Innovation Policy:
Uses dedicated funding and incubation platforms to stimulate research on industry 4.0, infrastructure resilience, emerging technologies, and sustainable manufacturing.

Key Administrative/Academic Units Involved

2.1.2 Several key administrative and academic units at MRU are actively engaged in Industry, Innovation, and Infrastructure:

- Centre for Innovation, Industrial Partnerships, and Infrastructure Development oversees interdisciplinary research, faculty-industry linkages, and external collaboration focused on technological innovation and infrastructure advancement.
- Department of Engineering, Technology, and Applied Sciences conducts academic and applied research on industrial automation, smart systems, and sustainable infrastructure, while fostering industry-driven learning and projects.

The Institution's Innovation Council (IIC) drives industry-relevant innovation, fostering practical solutions for sustainable infrastructure, advanced technology applications, and industrial growth through hands-on projects and collaborations.

The Industry, Technology, and Infrastructure Club (Student Body) organizes awareness initiatives, technical skill-building workshops, innovation hackathons, and project-based learning activities that promote industrial problem-solving and infrastructure development both on campus and in the wider community.

2.2 Curriculum Mapping

MRU has embedded concepts such as industrial innovation, infrastructure sustainability, advanced technological skills, and industry 4.0 awareness throughout its undergraduate and postgraduate curricula, particularly in Engineering, Technology, and related fields. These integrations are designed to:

- Sensitize students to the importance of resilient infrastructure, sustainable industrial practices, and responsible innovation.
- Equip students with cutting-edge technical, analytical, and problem-solving skills aligned with the evolving demands of global industries.
- Foster innovation-driven mindsets and preparedness for challenges in rapidly advancing technological and industrial sectors.

Students at Manav Rachna University have actively engaged in a wide range of national-level technical competitions, design hackathons, and industry-focused challenges. These experiences have significantly contributed to developing their technical acumen, nurturing creative problem-solving abilities, and preparing them to drive innovations and advancements within the industrial and infrastructure domains.

2.3 Regular Skill Set Enhancement at MRU – Certifications Earned by Students and Faculty Members

Skill development and continuous upskilling are central to MRU's commitment to advancing resilient infrastructure, sustainable industrialization, and innovation.
The university offers a broad range of certification programs, technical workshops, and training sessions through its specialized centers and academic departments. These initiatives equip students and faculty with cutting-edge skills in emerging technologies, smart infrastructure, and industrial innovation, ensuring they remain competitive and capable of driving progress in line with the goals of SDG 9.

3. Key Initiatives and Achievements

3.1 Research Contributions

- **Gunjan Chandwani**

"Fuzzy Local Information C-Means based Clustering and Fractional Dwarf Mongoose Optimization Enabled Deep Learning for Relevant Document Retrieval" – This paper demonstrates a hybrid deep learning model integrating advanced clustering and optimization algorithms to enhance intelligent document retrieval, driving innovations in digital information access

- **Yojna Arora**

"Systematic Review of the Association between Cancer-Related Dementia and Mality Systematic Review and Meta-Analysis" – The research reviews clinical evidence linking cancer-related dementia and mality, contributing insights that shape infrastructural development in interdisciplinary healthcare and data systems

- **Deepti Thakral**

"Intrusion Detection System for IoT-Based Healthcare Intrusions with Lion-Salp- Swarm-Optimization Algorithm Metaheuristic-Enabled Hybrid Intelligent Approach" – This study proposes a metaheuristic-based model for IoT healthcare intrusion detection, contributing to resilient and innovative health technology infrastructures.

- **Urmila Pilania, Manoj Kumar**

"A Walk-through towards Network Steganography Techniques" – The study explores innovative steganography techniques, supporting infrastructural advancements in secure digital communication networks.

3.2 Patents

The "Robot for Air Conditioner Duct Cleaning" by Shalu Singh, Anupriya, Poonam, Narender Ranga, Priya Saharan, and Vinit Kumar is an innovative device designed to automate duct cleaning, improving energy efficiency and industrial hygiene in sustainable building management.

- The "Autonomous Blockchain Based System for Generation and Delivery of Photographic Aadhaar Linked Birth Certificates" by Riya Sapra, Shraddha Arora, and Parneeta Dhaliwal is a secure blockchain-powered solution for birth certificate management, enhancing government service delivery and digital infrastructure.

- The "Device for Tracking Employee Behaviour Based on Machine Learning" by Dr. Pooja Kapoor and Mr. Neeraj Chopra leverages advanced analytics to monitor workplace behavior, supporting productivity and workforce development in modern business environments.

- The "Machine Learning Based Health Monitoring Wearable Device" by Dr. Pooja Kapoor promotes innovative healthcare by enabling real-time health tracking, improving personal and occupational health infrastructure.

- The "Enhanced Multi-Beam Interference Utilizing Modified Lens System" by Dinesh Kumar Sharma is a technical breakthrough enabling precise manipulation of beam interference for applications in photonics and sensor infrastructure.

- The "Synthesis and Utilization of Graphene Sheet with Periodic Vacancy for Hydrogen Storage" by Jaiparkash, Deepti Maihuri, Shiv Kumar Dixit, and Haider Abbas is a technological advancement in nanomaterials for sustainable energy and industrial innovation.

- The "Seat Belt with Heart Rate Recognition for Ignition of Vehicle" by Dr. Piyush Charan, Dr. Anshuman Sahai, Dr. Somya Asthana, Dr. Joginder Singh, Dr. Moditma is an inventive automotive safety system integrating health diagnostics for smarter transport infrastructure.

3.3 Student & Faculty projects

- Dhanyotsmi" — A project focused on sustainable innovation and infrastructure development, linked to SDG 9 and SDG 11 for smart and sustainable cities.
- "Currency Note Detector" — An AI-driven system to detect counterfeit currency notes, enhancing secure financial transactions and supporting industrial innovation.
- "Real-time Vehicle Tracking System" — A GPS-based project for efficient vehicle monitoring to improve logistics and transport infrastructure.
- "Freelancing Platform" — Developing a digital marketplace platform, promoting innovative gig economy solutions.
- "Student Innovation" — Encouraging new technology-driven ideas to address real-world challenges.
- "Implementation of Alumni Association Platform" — A digital platform enabling enhanced networking and infrastructure for alumni engagement.
- "Utilization of Images for Monitoring Construction Progress" — Applying image processing techniques for efficient construction project management.
- "Development of AIML-based Solution for Detection of Face-swap Deep Fake Videos" — Leveraging AI/ML for secure and reliable digital content verification.
- "Learning App for Deaf and Mute with Sign Language-English-Gujarati Converter" — Innovative assistive technology improving inclusive communication.
- "Developing an AI-based Interactive Chatbot for Department of Justice Website" — An intelligent assistant enhancing public service delivery.
- "Mobile App for Direct Market Access for Farmers" — Providing farmers innovative tools for direct sales, boosting agro-industry and rural infrastructure.

Book and Book Chapters

- **Abhishek Saxena**

"Artificial Intelligence (AI) for Everyone" – This chapter educates on the transformative potential of AI across industries, highlighting its role in driving innovation and technological development.

- **Hanu Bhardwaj, Jyoti Pruthi**

"Proposed Model for Data Warehouse Requirement Engineering" – The chapter discusses frameworks for efficient data warehousing essential for industry-scale analytics, supporting infrastructure readiness and information management for innovation.

- **Parneeta Dhaliwal, Manpreet Kaur**

"Computational Intelligence in Analytics and Information Systems" – Focused on advanced computational methods, this chapter supports the development of smart infrastructure and innovative analytics critical to industry growth.

- **Gunjan Chandwani, Meena Chaudhary**

"Design and Comparative Analysis of Inverted Indexing of Text Documents" – This work contributes to information retrieval systems enhancing digital infrastructure for efficient data handling in industrial applications.

- **Dr. Yogita Sharma, Dr. Animesh Singh**

"Business Innovation, Transformation, Sustainability" – This chapter explores models of business innovation and sustainable industry practices, emphasizing transformative strategies for infrastructure development.

- **Dr. Pooja Kapoor**

"Factors Influencing Consumer Acceptance of Mobile Wallets: A Comprehensive Review" – An examination of digital payment innovations influencing industry transformation and infrastructure for inclusive economic growth.

Guest Lectures and Talks

- On 25th July 2023, a session on the use of analytics was conducted, highlighting the role of data-driven decision making to foster innovation and partnerships.

- On 27th July 2023, a lecture titled "Identifying Opportunities with a Hawk Eye" focused on recognizing entrepreneurial and innovative business prospects.

- Faculty explored healthcare sector opportunities with an emphasis on technological advancements and inclusive industry growth in a session held on 19th June 2023.

- An insightful guest lecture on career prospects in the banking industry was conducted on 9th August 2023, highlighting the evolving technological landscape influencing the sector.

- Dr. Animesh Singh delivered an online session on PivotTable skills on 11th August 2023, encouraging data proficiency in management and commerce.

- A lecture on hypothesis testing and data analysis was presented on 19th August 2023, promoting analytical skills crucial for research and innovation.

- The role of financial technology in banking was detailed in a talk on 18th September 2023, showcasing innovations shaping financial services.

- On 10th September 2024, Akhilesh Kumar from LG Electronics shared expert insights on industry innovation

and sustainable consumption.

Outcome Highlights (2023–24)

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Entrepreneurial Capacity

Technovation, Code for Good), business simulation workshops, and finance quizzes cultivated innovation, teamwork, and entrepreneurial mindset among students1.

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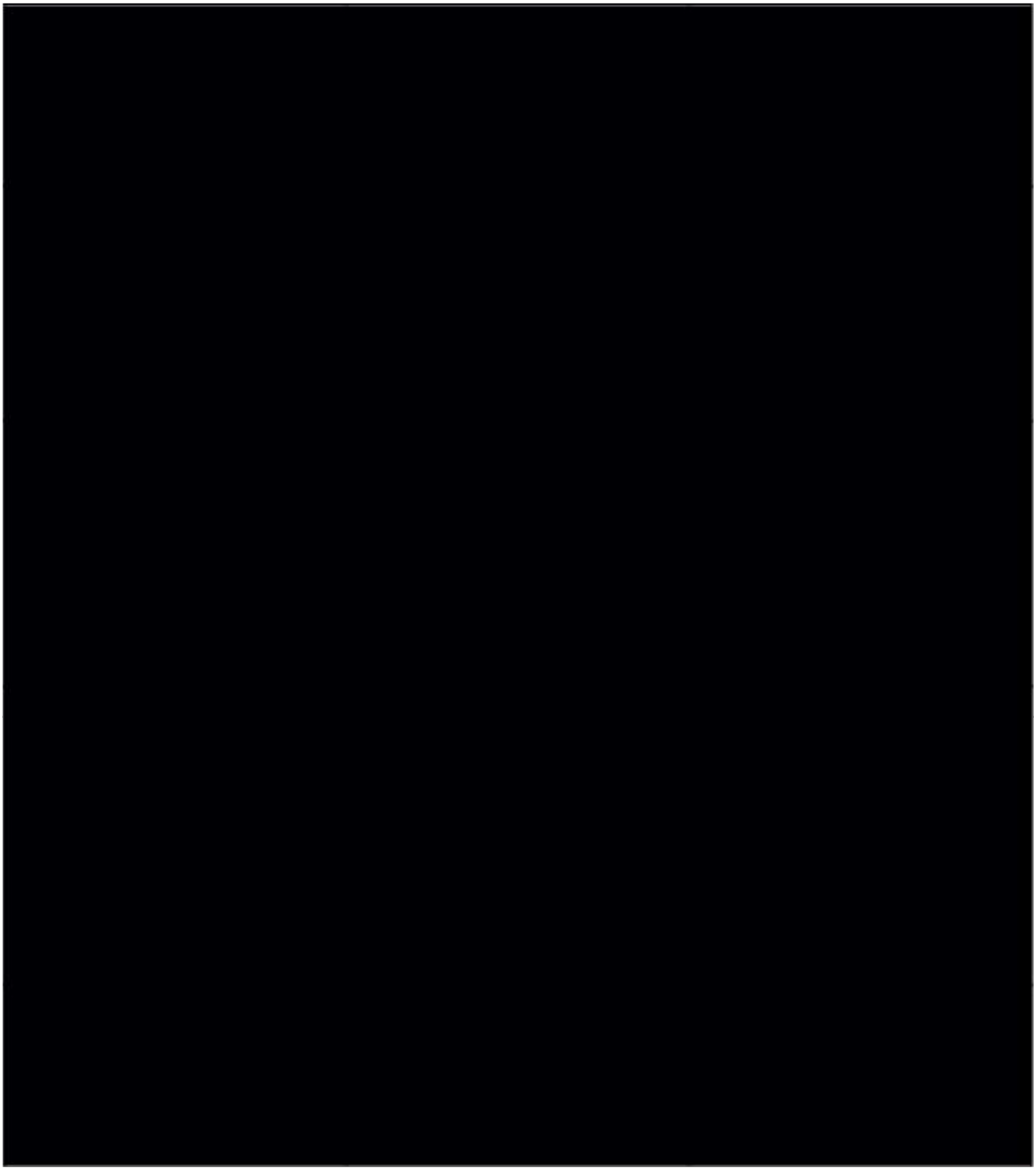
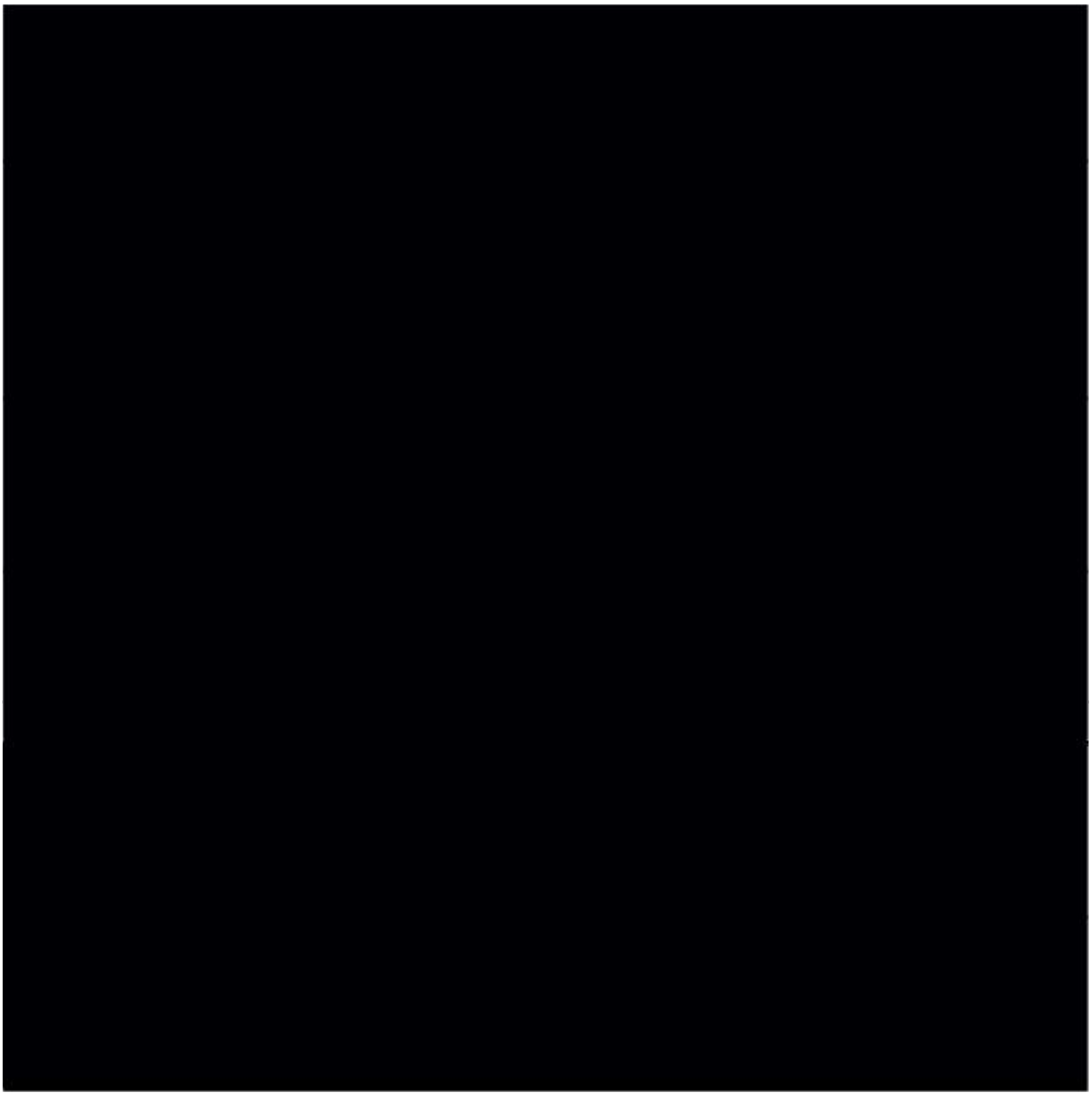
Key Performance Indicators



Challenges and Lessons Learned



Manav Rachna University's 2024-25 initiatives for SDG 9—Industry, Innovation, and Infrastructure— demonstrate a comprehensive and dynamic approach to fostering technological advancement, sustainable industrialization, and resilient infrastructure. The academic year highlighted robust
experiential learning, cutting-edge research, and strong industry partnerships. These achievements were realized while addressing challenges like cross-disciplinary integration, resource allocation,
and impact assessment.

INNOVATION & INCUBATION CENTRE

HackItUp 1.0

Manav Rachna School of Data and Computing (MRSDC) organized *HackItUp 1.0*, a 12-hour hackathon designed to ignite innovation and problem-solving among budding technologists. The event witnessed enthusiastic participation from multiple teams across disciplines, showcasing creativity and technical expertise in diverse domains.

Among the standout performers, **Team Shinchan** secured the **3rd Prize** 🥉 for their remarkable project titled *Crop Prediction Management*. The project aimed to revolutionize the agricultural landscape through the integration of data analytics and predictive modeling. *Crop Prediction Management* leverages advanced algorithms to forecast crop yields, enabling farmers to make informed decisions for efficient and sustainable farming. The solution underscores the role of technology in strengthening the agri-tech ecosystem by promoting data-driven agricultural practices.

The team comprised **Harsh Bhardwaj (2nd Year, CSE 4A)** as Team Leader, along with **Swayam Arora (2nd Year, CSE 4A)**, **Chhaya Sharma (1st Year, CSE 2C)**, and **Khushboo Mehta (1st Year, CSE 2C)**. The competition commenced with an online idea submission phase, followed by an intense 12-hour in-person hackathon where participants transformed their concepts into working prototypes. Team Shinchan's innovative approach, teamwork, and problem-solving capabilities impressed the judges, earning them the 3rd position among several competitive entries.

The achievement of Team Shinchan reflects their dedication, creativity, and strong coding acumen. Their success highlights the value of collaboration and innovation nurtured within the Manav Rachna ecosystem. The project holds promising potential for further development and real-world implementation in the field of smart agriculture.

Team Shinchan's accomplishment at HackItUp 1.0 demonstrates how young technologists can contribute meaningfully to solving real-world challenges. Their *Crop Prediction Management* solution stands as a testament to the university's commitment to fostering innovation, interdisciplinary learning, and societal impact through technology.


CHICAGO

Ideathon 1.0

A team of students from the **Department of Computer Science and Technology (DoCST)**, Manav Rachna University, participated in the **Ideathon 2023** organized by **J.C. Bose University of Science and Technology, YMCA, Faridabad** on **8th November 2023**. The team, comprising **Rishav**, **Harsh**, and **Avdhesh Kumar Sharma**, all students of the **5th semester**, secured the **3rd Prize** 🥉 among several competing teams from reputed institutions.

The students presented an innovative project based on the problem statement **"AI-Driven Navigation Assistant for Enhancing the Mobility of Blind Individuals."** The project focused on developing an intelligent assistive system that integrates artificial intelligence and sensor technologies to help visually impaired individuals navigate their surroundings safely and independently. The proposed solution aims to improve mobility, confidence, and accessibility, thereby contributing to the empowerment and inclusion of the blind community.

The project received appreciation for its **technical innovation, societal relevance, and practical application** in addressing a critical real-world challenge. The recognition at this prestigious platform reflects the students' strong problem-solving approach, teamwork, and ability to apply advanced technologies for social good.

This achievement also highlights the university's commitment to nurturing **innovation and social entrepreneurship** under the **Institution's Innovation Council (IIC)**, encouraging students to develop impactful solutions aligned with the United Nations Sustainable Development Goals (SDGs).

Ideathon 2.0

Report on participation in Ideathon 2.0

A team from the Department of Computer Science & Technology (DoCST) — Rishav, Harsh and Avdhesh Kumar Sharma (6th semester) — achieved **1st prize** in IDEATHON 2.0 held at J.C. Bose University of Science & Technology, YMCA, Faridabad on **6 March 2024**.

The team developed an **AI-driven navigation system** aimed at empowering visually impaired individuals by facilitating both education and self-reliance. According to the university's Innovation & Incubation Centre records, the project emphasises inclusive technology and social impact.

The competition, organised by the Institution's Innovation Council (IIC) of J.C. Bose University, provided a platform for student teams to propose innovative solutions to real-world challenges.

The achievement underscores the commitment of DoCST students to technological innovation with societal relevance and adds to the institution's portfolio of awards and achievements in innovation.

Sociothon

Report on participation in scociathon

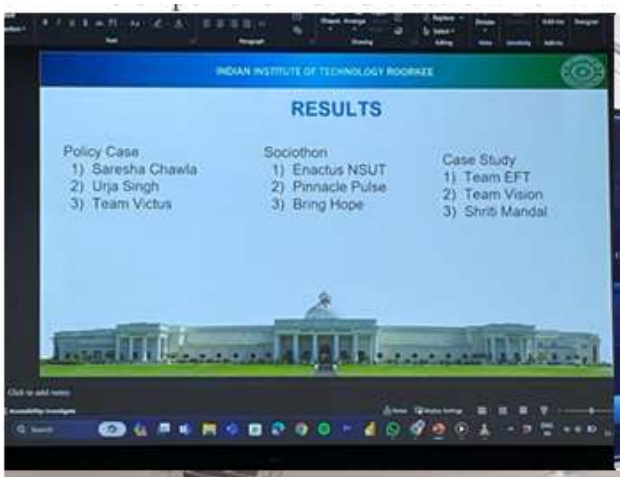
A team of students from the Department of Computer Science and Technology (DoCST), Manav Rachna University, participated in the **Sociothon** event at the **National Social Summit 2024**, hosted by **IIT Roorkee**. The team, named **Team Bring Hope**, comprised **Rishav**, **Harsh**, and **Avdhesh Kumar Sharma**, all students of the **6th semester**, DoCST. The team secured the **3rd Prize** 🥉 among several participants from reputed institutions across the country.

Team Bring Hope presented an innovative project titled **"AI-Driven Navigation System to Empower Blind Individuals."** The solution aims to leverage artificial intelligence to assist visually impaired individuals in navigating their surroundings safely and independently. The system not only facilitates mobility but also integrates educational support modules to help users gain knowledge and enhance their self-reliance.

The project reflects the team's vision of creating an inclusive society through the application of technology for social good. Their idea stood out for its **innovation, practicality, and strong social impact**, aligning with the broader goals of accessibility and empowerment for differently-abled individuals.

Participation in this prestigious event provided the students with exposure to real-world social innovation challenges, interdisciplinary collaboration, and the opportunity to present their ideas before esteemed judges and experts. The team's success at IIT Roorkee highlights their dedication, creativity, and technical excellence.

The achievement also underscores Manav Rachna University's commitment to promoting innovation and entrepreneurship under the **Institution's Innovation Council (IIC)** framework, encouraging students to contribute toward building a sustainable and inclusive future.



SAE BAJA 2024

Report on ATVC

Under MRU-IIC a team of nine students from a university participated in the Aravalli Terrain Vehicle Championship (ATVC) from 1st March to 5th March 2024. The team designed and fabricated a vehicle in the Fabrication Centre, which was funded with Rs. 5,70,000 from the university. The team was led by Mr. Mohit Sanju and Mr. Rajveer Singh Bedi, under the guidance of Dr. J P Sharma and Dr. Prashant Bhardwaj.

The team designed and fabricated a rugged off-road vehicle that was capable of navigating rough terrain. The vehicle was designed to be lightweight yet durable, with a powerful engine and high ground clearance. The team utilized the latest CAD/CAM software to design the vehicle and utilized various fabrication techniques to build the chassis, suspension, and other components. The team also designed and fabricated the steering, braking, and other systems, ensuring that they were safe and reliable.

The team extensively tested the vehicle in various conditions to ensure that it was capable of handling any challenge that came its way. The team tested the vehicle's acceleration, braking, steering, and suspension, making adjustments and

improvements where necessary. The team also tested the vehicle's stability and safety, ensuring that it was safe for the driver and passengers.

The team participated in the Aravalli Terrain Vehicle Championship, where they competed against other teams from different universities. The competition was held over five days, with various events such as acceleration, endurance, and maneuverability. The team performed well in all the events, demonstrating the vehicle's capabilities and the team's skills. Team acquire 9th position in the initial round at National Level hosted by Nutan Maharashtra Institute of Engineering and Technology, Talegoan and Orison Education India Ltd. This is a National Level Education and Innovation Festival to promote Skill India, Startup India, Go Green and Make In India. In this event, more than 100 teams participated with over 3500 participants with an ensemble of engineering undergraduates and diploma holders from various recognized institutes.

Overall, the team of nine students from the university performed exceptionally well in the Aravalli Terrain Vehicle Championship. The vehicle designed and fabricated by the team was rugged, reliable, and capable of navigating rough terrain. The team's performance in the competition demonstrated their skills and expertise in design, fabrication, and testing. The team's mentors, Dr. J P Sharma and Dr. Prashant Bhardwaj, provided valuable guidance and support throughout the project, ensuring that the team was successful in their endeavor.

Innovathon 2023

A team of students from the **Department of Computer Science and Technology (DoCST)**, Manav Rachna University, participated in **Innovathon 2023** organized by **Amity University, Gurugram** on **2nd–3rd November 2023**. The team, comprising **Tejas Singh**, **Vansh Aggarwal**, **Ayush Sachdeva**, and **Kartik Dargan**, secured the **2nd position** in this prestigious innovation competition. The team worked under the mentorship of **Dr. Parneeta Dhaliwal**, Department of Computer Science and Technology.

The students presented their project titled **"Revolutionising Waste Segregation using Deep Learning and Robotic Arm"**, which integrates artificial intelligence and robotics to automate the waste segregation process. The solution utilizes **deep learning algorithms** to accurately identify and classify different types of waste, while a **robotic arm**

mechanism ensures efficient sorting into respective categories. This innovation aims to address environmental and waste-management challenges by enhancing efficiency, reducing human intervention, and promoting sustainability.

The project was highly appreciated for its **technical innovation, real-world applicability, and societal impact**, earning the team a **cash prize of INR 50,000**. Innovathon 2023 provided a platform for young innovators to present creative solutions to pressing global issues through technology-driven ideas.

The success of the team reflects the strong culture of innovation and experiential learning fostered by the **Institution's Innovation Council (IIC)** at Manav Rachna University. The university continues to encourage students to explore interdisciplinary technologies that contribute to sustainable and inclusive growth.

Innovathon'23 (Differnt team as per above details)

A team of students from the **Department of Computer Science and Technology (DoCST)**, Manav Rachna University, participated in the **Innovathon'23 Hackathon** held at **Amity University, Gurugram** on **2nd–3rd November 2023**. The team, comprising **Tejwant Singh**, **Shreya Marwaha**, and **Sneha Kumari**, represented the **Institution's Innovation Council (IIC)** of the university and secured a place among the **Top 10 teams** out of a total of **97 participating teams** from across the country.

The team presented an impactful project titled **"Empowering Sustainable Practices: A Comprehensive Platform for Carbon Footprint Reduction and Eco-Mentorship."** The project aimed to promote environmental sustainability by offering users personalized tools to monitor, reduce, and offset their carbon footprint. Additionally, the platform connects individuals with sustainability experts and eco-mentors, fostering community-driven green initiatives and responsible practices.

The innovation was recognized for its **strong alignment with global sustainability goals**, combining technology, education, and environmental awareness to encourage climate-conscious behavior. The project demonstrated the team's creativity, technical competence, and commitment to developing digital solutions for environmental challenges.

Participation in **Innovathon'23** provided the students with an opportunity to collaborate, ideate, and showcase their innovative ideas before industry experts and academic mentors. Their selection among the top-performing teams reflects the university's focus on nurturing **innovation, sustainability, and experiential learning** under the **IIC framework**.

Avishkar
Internal Hackathon, AVISHKAR 2023

Internal Hackathon AVISHKAR 2023 Event of Smart India Hackathon (SIH) 2023 was conducted at Manav Rachna University on 20th September 2023 by the IIC team. As per MoE Innovation Cell-AICTE directive, a team of technical experts from the industry was invited as judges to MRU to evaluate the idea solution and its implementation and other parameters to specific problem statements demonstrated by several competing teams of our Engineering students and select the teams to be nominated for SIH 2023 registration for final competition at National level. Each team had 6 students with at least one female student in each group. 18 teams participated in the internal Hackathon held at Manav Rachna University @ HB-02. Students participated enthusiastically and presented their solutions to the Jury members. Mr. Pranav Chauhan (Technical Manager, Design Tech Pvt. Ltd), Dr. Kiran Khattar (Associate professor at BML University) and Dr. Devnajali (Associate professor at BML University) were the three judges invited from industry. The evaluation process was done with solution presentation as per the SIH 2023 format and students demonstrated the basic functionalities of their solutions in both hardware and software category. The rigorous evaluation process and feedback done by all the jury members were constructive for the teams to understand their shortcomings and solution improvement. Jury members congratulated all the team members and gave them best wishes for the national level (Smart India Hackathon 2023) event.

A few Pictures of the event are attached along with list of teams and few sample certificate are attached as below:

Pitchdeck – A Sustainable Idea Competition

On 7th September, 2023, the Innovation and Entrepreneurship club, under the pre incubation centre along IIC, Manav Rachna University organized a pitching event – “Pitchdeck- A sustainable Idea Generation Competition”, to introduce the first-year students to the I&E club. The event commenced with an engaging registration process that drew the attention of aspiring entrepreneurs across the university. The registration period spanned two weeks and was open to all students interested in presenting their innovative business ideas. The registration period consists of online registration, team formation, idea synopsis, selection criteria, confirmation email. Interested students accessed the registration link to filled out a comprehensive online registration form. Each team submitted a concise synopsis of their business idea, highlighting the problem they aim to solve, their proposed solution, and the potential impact of their innovation. Upon successful submission of the registration form, participants received a confirmation email containing further details about the event, including the pitch format, evaluation criteria, and important data and time. The Pitchdeck event was held on 7th September, 2023 at the K block room no. KG02. The event spanned from 12:30pm to 3:30pm, offering a mix of idea pitching, jury evaluation, and networking opportunities. The Jury consisted of an external guest Mr Mohit Mahajan, Our universities Dean Research, Dr. Pradeep K Varshney and Dr. Yogita Sharma, Head of Entrepreneurship, Incubation & Startup. There were total of 10 teams that were selected to present their idea and the jury evaluated them on the basis of novelty of idea, relation to sustainable goal, uniqueness and presentation. With the opening of ceremony, each participating team took the stage to deliver a compelling pitch of their business idea. Teams were allotted a maximum of

5 minutes for their presentation, followed by a brief Q&A session with the jury. After each pitch, the jury members engaged in private discussion to evaluate ideas based on predetermined criteria. The event closed with an opportunity to connect and exchange insights. The Pitchdeck event's registration process and overall execution highlighted the dedication of the Innovation & Entrepreneurship Club to fostering a culture of innovation within the university. By creating an inclusive platform for first year students to showcase their entrepreneurial ideas, the event contributed to the growth of innovative thinking and provided a stepping stone for potential future ventures. This whole event was executed by the team I&E Club under the guidance of Dr. Yogita Sharma.

Motivational Session by Successful Entrepreneurs/Startup-Founders

On Saturday, September 9, 2023 from 12:00- onwards, an insightful online webinar was organized in association with AIC BIMTECH, featuring Mr. Pulkit Madan, the esteemed Founder and CEO of Warp Bay. The Webinar was organized by Manav Rachna University's Entrepreneurship cell (E-Cell) under MRU Innovation and Incubation cell (IIC). The webinar aimed to provide students with valuable insights into the realms of startups and entrepreneurship, drawing from Mr. Madan's personal journey and experiences. Mr. Pulkit Madan, known for his exemplary entrepreneurial journey with Warp Bay,

took center stage during the webinar. He shared his challenges, triumphs, and invaluable lessons learned along the way. His talk encompassed various facets of entrepreneurship, ranging from the inception of an idea to the execution of a successful venture. Mr. Madan delivered a comprehensive discourse, touching upon several pivotal aspects of entrepreneurship. He emphasized the significance of assembling a passionate and skilled team, advocating for a collaborative environment where each member complements the others' strengths. Underscoring the inevitable hurdles in the entrepreneurial journey, Mr. Madan stressed the importance of resilience and determination in overcoming challenges. He encouraged students to seek wisdom from successful entrepreneurs, highlighting the importance of networking and continuous learning in fostering growth and innovation. Mr. Madan emphasized the necessity of staying abreast of market trends, being open to taking calculated risks, and adapting strategies accordingly. Providing practical insights, he offered advice on formulating business plans, devising effective marketing strategies, and securing capital for startups. The webinar concluded with several key takeaways for aspiring entrepreneurs: The importance of a strong and cohesive team, The necessity of perseverance in the face of challenges, The value of learning from others' experiences and networking, remaining updated on industry trends and being adaptable, embracing calculated risks and seizing opportunities, Implementing concrete strategies for business development and growth. In summary, the online webinar featuring Mr. Pulkit Madan served as a beacon of inspiration and guidance for the enthusiastic students from Manav Rachna University. The session not only illuminated the intricacies of entrepreneurship but also equipped attendees with practical insights and strategies essential for navigating the dynamic landscape of startups. Mr. Madan's expertise and wisdom undoubtedly left an indelible mark on the aspiring entrepreneurs, paving the way for their future endeavours. The organizers extend heartfelt gratitude to Mr. Pulkit Madan for his invaluable contribution to the webinar, as well as to all the participants for their active engagement and enthusiasm. A total of 100+ students from Manav Rachna University.

Workshop on 3D Modelling Software

The Society of Automotive Engineers (SAE) in collaboration with IIC and ME department at MRU organized a workshop on Industry 4.0, a revolutionary concept encompassing the integration of advanced technologies to enhance automation in various industries. The workshop aimed to impart knowledge on the practical implementation of automation through the use of relays, Arduino, Raspberry Pi, and robotic arms, with a focus on communication using Python programming.

The workshop was conducted by Mr. Manaj Yadav, a distinguished expert from SVR Infotech, Pune. Mr. Yadav brought a wealth of experience and practical insights into the application of Industry 4.0 technologies. His expertise in automation, relay systems, Arduino programming, Raspberry Pi applications, and robotic arm control through Python programming made him an ideal resource person for this workshop.

The workshop covered a wide range of topics to provide participants with a comprehensive understanding of Industry 4.0. The key areas included:

- Introduction to Industry 4.0: Understanding the fundamental concepts and principles behind the fourth industrial revolution.
- Automation Basics: Exploring the role of relays in automation and their application in various industries.
- Arduino and Raspberry Pi Integration: Practical sessions on programming and interfacing Arduino and Raspberry Pi for automation purposes.
- Python Programming for Communication: An in-depth look into Python programming for effective communication between automated systems.
- Robotic Arm Control: Hands-on sessions on controlling robotic arms and their integration into automated processes.

Workshop Highlights:

- Interactive Sessions: The workshop featured interactive sessions, encouraging participants to ask questions and engage in discussions with Mr. Manaj Yadav, fostering a dynamic learning environment.
- Live Demonstrations: Live demonstrations of automation setups, including relay systems, Arduino programming, Raspberry Pi integration, and robotic arm control, provided practical insights into Industry 4.0 applications.
- Hands-on Activities: Participants had the opportunity to participate in hands-on activities, allowing them to apply the concepts learned during the workshop.
- Networking Opportunities: The workshop provided a platform for students to connect with industry experts, fostering networking opportunities for potential collaborations and knowledge exchange.

Conclusion:

The Industry 4.0 workshop conducted by the SAE Society of MRU, featuring Mr. Manaj Yadav from SVR Infotech, Pune, was a resounding success. Participants gained valuable insights into the practical applications of automation technologies, equipping them with the knowledge and skills needed for the evolving landscape of Industry 4.0.

The workshop not only contributed to the academic and professional growth of the participants but also strengthened the ties between MRU's SAE Society and industry professionals, paving the way for future collaborations and knowledge-sharing initiatives.

IIC Regional Meet at Punjab University, Chandigarh

The IIC Regional Meet at Panjab University, Chandigarh, held on 20th November 2023, marked a significant gathering of innovation enthusiasts, researchers, and institutions under the Innovation and Incubation Cell (IIC). The event aimed to foster collaboration, share achievements, and explore opportunities for leveraging resources among participating institutions.

The regional meet was attended by 3 faculty of Manav Rachna University, Faridabad i.e. Dr. Pragati Chauhan, Dr. J P Sharma & Mr. Vijay Gill.

The session commenced with a vibrant inauguration ceremony, featuring the demonstration of innovative projects such as Yukti Innovation. This provided a platform for participants to showcase their groundbreaking work and share insights into technological advancements. The display of posters by participating institutions added an interactive dimension, allowing each institution to highlight their achievements and activities conducted on their respective campuses.

A pivotal aspect of the event was the IIC Council Meeting, where leaders and representatives from various institutions convened to discuss strategic initiatives and collaborative efforts. The meeting emphasized the importance of fostering connections among institutions to harness collective resources effectively. Participants were instructed to establish meaningful collaborations, sharing knowledge, expertise, and resources for the betterment of the innovation ecosystem.

Throughout the event, attendees were encouraged to connect with one another to explore potential collaborations and partnerships. The emphasis on networking aimed to create a dynamic ecosystem where institutions could leverage each other's strengths, paving the way for enhanced innovation and research activities.

The event featured various talk sessions organized into four distinct verticals based on participants' interests. These sessions delved into specific areas of innovation, research, and entrepreneurship. Participants had the opportunity to engage in discussions, share insights, and gain valuable knowledge from experts within their chosen verticals.

The IIC Regional Meet at Panjab University, Chandigarh, on 20th November 2023, was a resounding success, fostering collaboration, knowledge sharing, and networking among institutions and individuals dedicated to innovation. The event not only showcased pioneering projects but also provided a platform for fruitful discussions, laying the foundation for future collaborative endeavors. As institutions continue to connect and leverage each other's resources, the innovation ecosystem is poised for significant growth and development.

Structural and CFD Simulation through ANSYS

Date: 2nd & 3rd February 2024
Time: 9:00 am - 3:00 pm
Speakers: Dr. Joginder Singh and Dr. J P Sharma, ME -MRU

Venue: K Block, Ground Floor, Lab 1

The workshop on Structural and CFD Simulation through Ansys, conducted by esteemed speakers Dr. Joginder Singh and Dr. J P Sharma, took place on February 2nd & 3rd, 2024, from 9:00 am to 3:00 pm. The session aimed to provide valuable insights and hands-on experience in the pre and postprocessing stages of problem setup, including geometry import, meshing, boundary conditions, and result visualization.

The workshop commenced with an introduction by Dr. Joginder Singh and Dr. J P Sharma, emphasizing the importance of simulation in engineering and its role in converting innovative ideas into tangible products. The focus was on how Ansys, a widely used simulation software, can be a powerful tool in achieving this transformation.

The session delved into practical aspects, offering hands-on experience to the attending faculty members. Participants were guided through the intricate process of problem setup, covering key elements such as geometry import, meshing techniques, application of boundary conditions, and effective result visualization. This interactive approach allowed faculty members to actively engage with the software, enhancing their understanding of the simulation process.

The workshop saw active participation from faculty members, creating an environment conducive to collaborative learning. Dr. Joginder Singh and Dr. J P Sharma fielded questions, provided clarifications, and shared real-world examples to enrich the learning experience. The diverse backgrounds of the participants, ranging from various engineering disciplines, added depth to the discussions.

The overarching goal of the workshop was to empower faculty members to leverage simulation tools like Ansys in converting their ideas into tangible products. By mastering the pre and post-processing stages of structural and CFD simulation, participants gained valuable skills to drive innovation within their academic and research pursuits.

During the workshop, the learning achieved by the faculty are as follows:

- Comprehensive Understanding: Participants acquired a comprehensive understanding of the Ansys simulation workflow, from geometry setup to result interpretation.
- Practical Application: The hands-on nature of the workshop allowed faculty members to directly apply theoretical concepts, bridging the gap between theory and practice.
- Innovation Catalyst: Armed with newfound skills, faculty members are now equipped to convert their innovative ideas into viable products through the power of simulation.

In conclusion, the Structural and CFD Simulation workshop through Ansys, led by Dr. Joginder Singh and Dr. J P Sharma, served as a valuable platform for faculty members to enhance their simulation capabilities. The acquired knowledge and skills are expected to catalyze innovation within the academic community, fostering a culture of applied research and development.

USER AWARENESS ON INTELLECTUAL PROPERTY RIGHTS

A workshop on "User Awareness on Intellectual Property Rights (IPR)" was organized by Swami Vivekananda Library and Research Cell in collaboration with IPR Cell and IQAC Cell on 24th of January 2024 from 11:00 a.m. onwards at I Block Auditorium, Manav Rachna University. The resource person for the workshop was Dr. Priya Rai, Deputy Librarian, National Law University, Delhi. The workshop aimed to educate participants about the importance of intellectual property rights, it's role in fostering innovation, and the legal aspects associated with protecting intellectual creations.

The workshop began with an inaugural session, featuring opening remarks by Ms. Hitika Singh, Ph.D. Research Scholar at Manav Rachna University, who highlighted the importance of intellectual property in today's knowledge-driven economy. Dr. Priya Rai then provided an overview of the workshop's objectives and the agenda for the day.

Dr. Rai conducted an insightful session explaining the fundamental concepts of intellectual property, including patents, trademarks, copyrights, Geographical Indications, and trade secrets. Participants were introduced to the key differences between these forms of protection and their applications in various industries. The resource person emphasized the role of intellectual property in fostering innovation and economic development. Case studies and examples were presented to illustrate how businesses and individuals benefit from protecting their intellectual creations. Dr. Rai provided a comprehensive overview of the legal framework surrounding intellectual property rights. This session covered the application process for obtaining patents, trademarks, and copyrights, as well as the enforcement mechanisms available to protect these rights.

Participants were engaged in interactive manner and through case studies to reinforce them understanding of intellectual property concepts. Practical scenarios were presented, allowing participants to apply their knowledge and gain insights into real-world challenges. The workshop concluded with a lively question and answer session, where participants had the opportunity to seek clarification on specific topics and share their thoughts. Dr. Rai provided valuable insights and guidance, addressing the queries raised by the participants. The workshop on "User Awareness on Intellectual Property Rights" conducted by Dr. Priya Rai proved to be a valuable learning experience for participants. Attendees gained a deeper understanding of the importance of intellectual property, its role in innovation, and the legal mechanisms for protection of Intellectual property. Overall, the workshop contributed in raising awareness and fostering a culture of respect for intellectual property

rights among the participants.

The workshop concluded with Vote of Thanks by Dr. Mamta Kaushik, Deputy Librarian, Manav Rachna University. Dr. Mamta expressed gratitude to the participants for their active engagement and enthusiasm throughout the workshop. The session was an acknowledgement of importance ofraising awareness about intellectual property rights and the need for ongoing education in this rapidly evolving field.

TRAINING SESSION ON PLAGIARISM DETECTION SOFTWARE

Swami Vivekananda Library and Resource Centre, IPR Cell and Internal Quality Assurance Cell, Manav Rachna University in Collaboration with Balani Infotech Pvt Ltd organized a Training session on "Using Plagiarism Detection Software Drillbit" for the faculty members of Manav Rachna University at Audio Visual Room L block, Swami Vivekananda Library & Resource Centre. The Session was conducted by Mr. Prakash Sachan, Sr. Account Manager, Balani Infotech Pvt Ltd. The session aimed to familiarize participants with the features, functionality, and effective utilization of the software in detecting plagiarism in academic and professional documents.

Mr. Sachan provided an in-depth introduction to "Drillbit," highlighting its significance in the context of academic integrity and content originality. He emphasized its user-friendly interface and robust algorithm designed to identify plagiarized content effectively. Participants were guided through the software interface, including its various tabs, tools, and settings. Mr. Sachan demonstrated how to navigate through the platform effortlessly, ensuring participants could utilize its features efficiently. The training session covered the process of uploading documents onto the "Drillbit" platform for analysis. Mr. Sachan explained the supported file formats and best practices for ensuring accurate results during the scanning process. The session delved into the customization options available within "Drillbit," allowing users to tailor the scanning parameters according to their specific requirements. Mr. Sachan elucidated on adjusting sensitivity levels, exclusion settings, and citation styles to enhance the accuracy of plagiarism detection.

The training session equipped the participants with the necessary knowledge and skills to utilize the plagiarism detection software effectively in their academic and professional endeavors. The session concluded with a Q&A segment, allowing participants to seek clarification on any queries or concerns regarding the software. The training session on the plagiarism detection software "Drillbit" proved to be highly informative and beneficial for all participants. By the end of the session, participants gained a thorough understanding of how to effectively utilize "Drillbit" to detect and prevent plagiarism in their academic and professional endeavors.

Special thanks to Mr. Prakash Sachan for his expertise and guidance, and to Dr. Mamta Kaushik for organizing the event. Overall, the training session received positive feedback from participants, who expressed confidence in utilizing "Drillbit" to uphold integrity and originality in their work.

4 DAYS BUSINESS SIMULATION WORKSHOP

A 4-day Business Simulation workshop was conducted at School of Management & Commerce, MRU in collaboration with IIC, MRU to provide students handson experience in a virtual business world where they create their own companies, bootstrap their funds and get it running in a competitive space. The game was called “Business Fundamentals- Carbon Fibre Bike Challenge” created and licensed by US Marketplace Simulations. It is about a bicycle industry that is introducing an economical version of carbon fibre using 3D manufacturing technology in certain geographic markets and target segments that the game defines. The game was divided in 4 quarters and thus the students had actually run their firms for a year. Each quarter the decisions became more complex, competition more intense and teams experienced more excitement and challenges to maintain their market position. A brief on the 4 quarters is:

Quarter1: Introduction to Business Fundamentals- your company and set your business in motion. organize

Quarter 2: Go Test the Market- Take all tactical decisions like employee compensation plans, production scheduling, advertising campaigns, pricing, sales and service personnel, cash flow, and profitability.

Quarter 3: Skilful Adjustments and Market Expansion- Review performance during the test market and adjust strategy and tactics. Do strategic analysis and SWOT.

Quarter 4: Invest in the Future- Review and revise your strategy in light of your assessment and the new Venture funding that is available.

There were 7 participating teams of 35 students who identified their target segments, geographic markets, created their own brands and took decisions ranging from designing their product, marketing, setting the price, scheduling the production, hiring workforce, managing cash flows and profitability etc. The students were actively engaged throughout these days from 10 am to 4 pm and also taking out time from their home to meet the game deadlines.

This simulation experience worked towards developing their analytical and critical thinking skills, develop leadership, teamwork, and interpersonal skills, promote better decision making by learning to manage a totally integrated company, and facilitate learning of important business concepts, principles, and ways of thinking. They also got to understand how performance is evaluated using the Balanced Scorecard tool which is a better parameter for a firm’s performance.

Out of the 7 participating teams one team of girls was from K L Mehta Dayanand College Faridabad who had shown keen interest to be part of this workshop and also seeking support from MRU IIC towards such other entrepreneurial activities, mentoring and funding start-ups in future.

Few team building exercises were also incorporated in this 4-day workshop for better coordination and focus in the game.

The resource person for this workshop was Dr Pragati Chauhan, Prof -SMC MRU & Simulation Coach and Dr Bindu Agrawal – Master Simulation Coach.

TECH SHOWCASE

The Department of Electronics and Communication Engineering, Manav Rachna University in collaboration with IIC, MRU organized a "TechShowCase" on 28th March 2024 at H Block third floor which served as a platform for students to showcase their innovative projects. The event commenced with an inaugural ceremony graced by the presence of the Honorable Pro Vice Chancellor Mam, Dr. Sangita Banga and Registrar Sir, Mr. R.K. Arora.

Tech ShowCase witnessed an impressive array of innovative projects presented by B.Tech students covering a wide area of technology. The projects were evaluated by a distinguished panel of judges, including Dr. Abhiruchi Passi, Professor, ECE, MRIIRS, Mr. Vijay Gill, Assistant Professor, ECE, MRU, and Dr. Jai Prakash Sharma, Associate Professor, MRU. Their expertise and insights played a crucial role in assessing the projects and selecting the winners. The winners were announced amidst much anticipation and excitement. The team "Solar Works" received the cash prize for their outstanding project. The first prize was awarded to team "Proper 12," the second prize to team "Team Explorer," and the third prize to team "Solo Leveling." Each winning team was commended for their creativity, ingenuity, and hard work.

The judges were felicitated for their valuable contribution to the event by Dr. Shruti Vashist, Dean Academics, MRU, and Dr. Meenakshi Gupta, Associate Head, ECE, MRU. Their guidance and support were deeply appreciated by the organizing committee and participants alike. Mr. Bhanu Pratap Chaudhary, Assistant Professor, ECE, MRU, efficiently coordinated the event, ensuring smooth organization and execution. His dedication and efforts were instrumental in the success of the

exhibition.

The Tech ShowCase Project Exhibition was a resounding success, thanks to the collective efforts of the organizing committee, participants, judges, and guests. The event provided a platform for students to unleash their innovative potential and showcased the remarkable talent. Few glimpses for the session are attached.

Innovate with Technology

INNOVATE AND ELEVATE 1.0 MASTERING FULL STACK DEVELOPMENT

Orientation cum Refreshers' Session on Institution's Innovation Council Objectives, Structure, Operation for IIC Institutions

Strengthening IIC Linkages with ATLs and SICs in Schools and Framework for providing Mentorship Guidance

Technical Innovation- Biomimicry: It’s Time to Ask Nature

Leveraging MOUs for Entrepreneurial and Professional Growth

Independence Day Celebration at Manav Rachna University

Applications of Mathematics in Data Sciences

Industrial Visit: Haier Appliances India Pvt. Ltd

Participation by MRU team in Startup Maha Kumbh- Pragati maidan

GUEST LECTURES

Report on Session : Exploring Opportunities in the healthcare sector

SMC under the flagship of Manav Rachna university organized an online instagram live show on 19th June, 2023 to niche BBA s to our students and BBA - Global healthcare Management .

Following experts from Health care industry joined the programmer :-

- Miss Netra Tandon (Zonal Head Service delivery Marengo Asian Healthcare QRG)
- Dr. Vandana Bhardwaj (Operations Head Sarvodaya Hospital and Research Centre
- Kanika Kapoor (Manager Operations with Marengo Asian Healthcare QRG)
- Dr. Parul Jahjahria (Dean - SMC, MRU)
- Dr. Ritika Kharbanda (Communication Head, MRIIRS)

The features of the show was to market the program BBA Global Health Care Management to highlight the growth of the healthcare industry and the dearth of career opportunities for our GHCM graduates available with decent packages. Experts highlighted the Pre and Post covid 19 health scenario and arising demands of patients centric care. They drew attention to the implementation of various health care policies that the government initiated with the help of private NGOs and other organizations. About 150 above aspiring students had joined online to know about the curriculum, its eligibility, duration, training and Placement. All the experts further highlighted the current scenario of healthcare and focused on the future growth and career opportunities in industry. Experts also threw light on requirements of Admin / HR/ Operation Managers to keep pace with industry needs. That is why Studying Health Care management becomes necessary to develop managerial skills to meet the growing challenges in health care. Because these courses play a vital role in meeting the industry's evolving demands and are valuable in providing efficient health care services.

Event Report

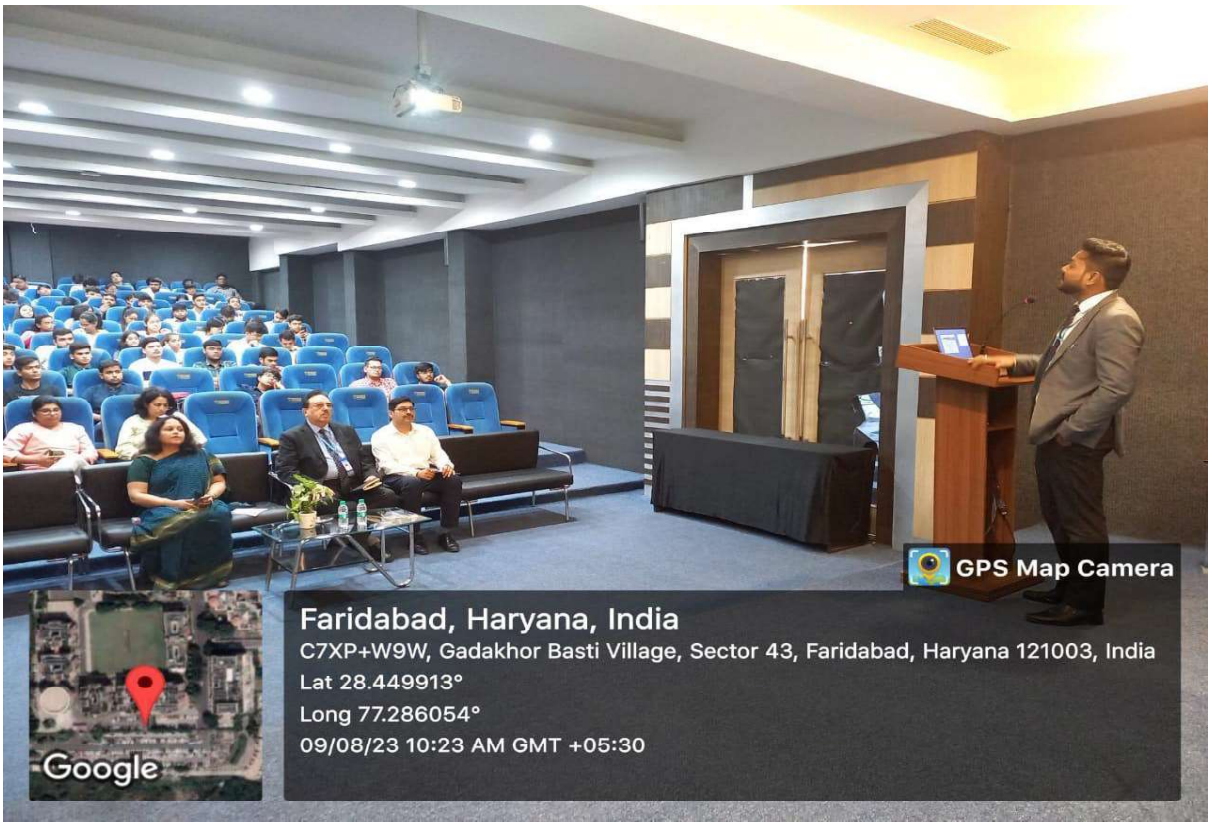
Title: "Career Prospects in Banking Industry"

Date: 9th August 2023, Time:10:00AM-11:30 AM

Event Coordinator: Dr Sunil Kadyan, Associate Professor SMC, Manav Rachna University

School of Management and Commerce, Manav Rachna University Faridabad organised an informative guest lecture on the topic "Career Prospects in Banking Industry" for UG and PG students at I Block Auditorium, Manav Rachna University on 9th August 2023. Prof (Dr) N K Bhasin, Head, Professional Development Centre (PDC), Indian Institute of Banking & Finance (IIBF) New Delhi was keynote speaker for this event. The main objective of this guest lecture was to sensitize the students regarding career prospects, various new job roles available in the Banking Industry. To make them aware about the role of Banking Professional Certification in their career path.

The program was initiated with a warm welcome from the organizers. The speaker talked about various IIFB certifications available for students. He also talked about the scope of these certifications. He laid emphasis on required skill set required for Banking jobs. He said there are lot of job opportunities in Banking sector.



100 students from the BBA FAA and MBA BA programs along with 5 faculties actively attended the session. The official vote of thanks was presented by Prof (Dr)Tanushri Purohit HOD SMC MRU.

A meeting was held after the guest lecture in longue which was attended by IIBF officials Dr N K Bhasin, Head PDC, Mr Aman Dhar Executive CDC with Dr Parul Jhajharia Dean SMC, Prof (Dr)Tanushri Purohit HOD SMC, Dr Pragati Chauhan Associate Professor SMC, Dr Sunil Kadyan Associate Professor SMC for future MOU and professional collaborations with IIBF New Delhi.

The event received positive feedback from both students and faculty members, indicating a strong demand for such informative sessions in the future. The organizers expressed their commitment to continuing these efforts to empower students with the knowledge and skills required to get job in BFSI domain effectively.

Session Report: Online Session on PivotTable by Dr. Animesh Singh

Date: August 11, 2023

Time: 2:00 PM – 3:00 PM

Mode: Online

Facilitator: Dr. Animesh Singh, Associate Professor, School of Management & Commerce

Program: Management Development Program (MDP) on "Financial Decision-Making Using Excel"

Host: Arun Jaitley National Institute of Financial Management (AJNIFM)

Dr. Animesh Singh, an esteemed Associate Professor in the School of Management & Commerce, conducted an online session on PivotTables as part of the Management Development Program (MDP) on "Financial Decision-Making Using Excel." The session took place on August 11, 2023, and aimed to provide participants with a comprehensive understanding of PivotTables and their application in financial analysis. The online format allowed participants to attend remotely and benefit from Dr. Singh's expertise.

Dr. Singh commenced the session by introducing the concept of PivotTables and their significance in financial analysis. He emphasized how PivotTables serve as powerful tools to summarize and analyze large datasets, making complex financial data more manageable and insightful.

Participants were guided through the step-by-step process of creating PivotTables using Excel. Dr. Singh explained how to select relevant data, arrange fields, and customize the table layout to suit specific analytical needs. Participants learned advanced techniques such as data grouping, calculated fields, and filters within PivotTables. Dr. Singh's clear explanations and real-world examples elucidated the practical application of these techniques in financial decision-making. The session also covered the transformation of PivotTable data into meaningful Pivot Charts for enhanced visualization. Dr. Singh highlighted the importance of visual representation in conveying financial insights effectively.

The session concluded with an interactive Q&A session, during which participants engaged with Dr. Singh, seeking clarifications, sharing experiences, and discussing challenges related to PivotTable usage.

Participants expressed their gratitude for Dr. Singh's expertise and engaging teaching style. They commended his ability to break down complex concepts and appreciated the interactive nature of the session.

Online Guest Lecture on “Decoding Hypothesis Testing: Revealing The Insights"

Event Details:

Title: Decoding Hypothesis Testing: Revealing The Insights
Date: 19th August 2023
Speaker: Dr. Shivoham Singh
Coordinator: Dr. Animesh Singh
Audience: PhD Scholars

School of Management and Commerce of Manav Rachna University organized an online guest lecture on "Decoding Hypothesis Testing: Revealing the Insights" for Ph.D. scholars on 19th August 2023. The lecture aimed to provide a comprehensive understanding of hypothesis testing, a fundamental statistical concept widely used in research and academia. The speaker for the session was Dr. Shivoham Singh, a recognized expert in the field of statistics.

Dr. Shivoham Singh commenced the lecture by elucidating the significance of hypothesis testing in the research domain. He highlighted how hypothesis testing helps researchers make informed decisions about population parameters based on sample data. The lecture was designed to be interactive, encouraging participants to ask questions and share their insights.

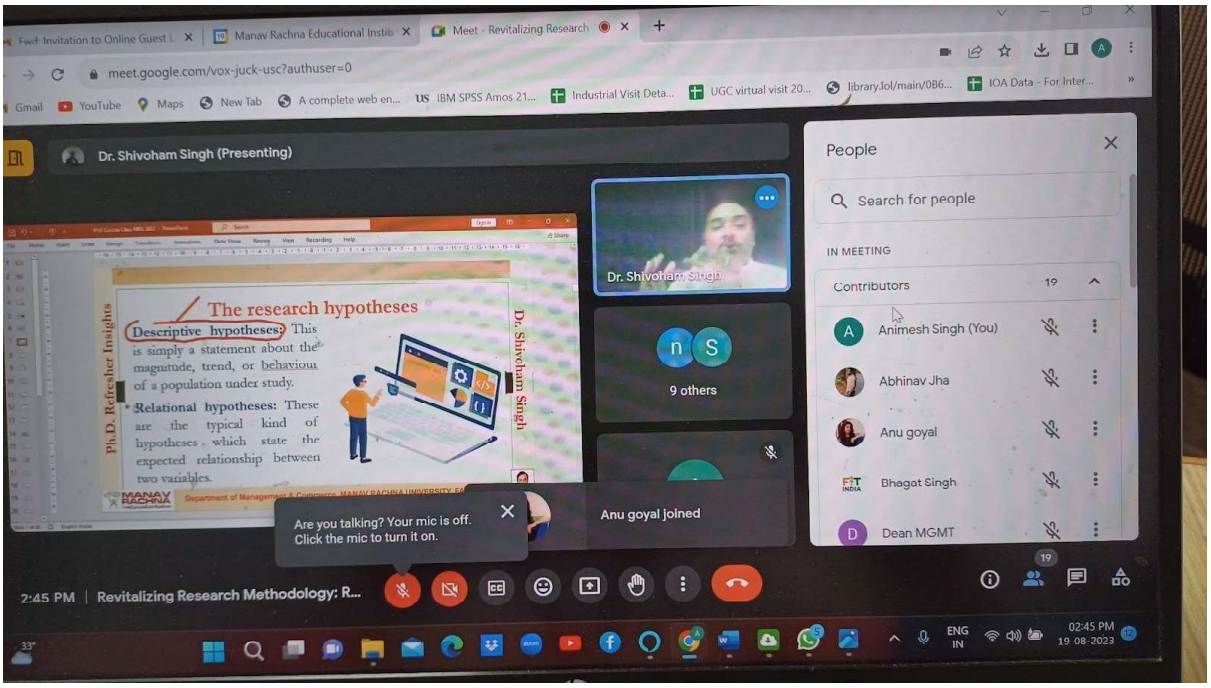
The main points covered in the lecture were:

- Fundamentals of Hypothesis Testing
- Steps in Hypothesis Testing
- Types of Errors
- Interpreting Results
- Real-world Applications

The lecture was highly interactive, with more than 20 PhD scholars actively participating. Participants asked questions, sought clarifications, and shared their research experiences related to hypothesis testing. Dr. Singh addressed each query thoughtfully, fostering a dynamic learning environment.

Conclusion:

The online guest lecture on "Decoding Hypothesis Testing: Revealing The Insights" delivered by Dr. Shivoham Singh and coordinated by Dr. Animesh Singh was a resounding success. The event succeeded in enhancing the participants' comprehension of hypothesis testing, equipping them with valuable insights applicable to their research pursuits. The lecture not only provided a solid foundation in statistical concepts but also facilitated collaborative learning and critical thinking among the attending PhD scholars.



MANAV RACHNA Vidyaparkrishal

MANAV RACHNA UNIVERSITY

Declared as State Private University vide Haryana Act 26 of 2014

SCHOOL OF MANAGEMENT & COMMERCE

PRESENTS

GUEST LECTURE

ON

REVITALIZING RESEARCH METHODOLOGY: REFRESHER INSIGHTS - MODULE I

DECODING HYPOTHESIS TESTING: REVEALING THE INSIGHTS

DATE

SATURDAY 19, AUGUST

TIME

2:30 PM ONWARDS

GOOGLE MEET LINK

https://meet.google.com/vox-juck-usc

SPEAKER

DR. SHIVOHAM SINGH

ASSOCIATE PROFESSOR

MANAV RACHNA UNIVERSITY

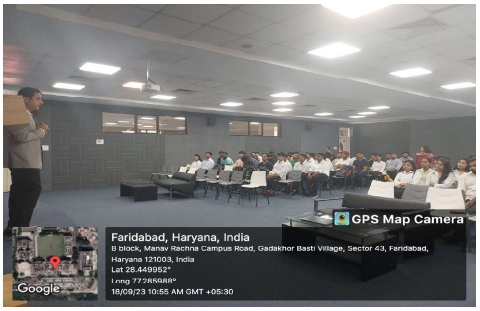
Topic : Role of Fintech in Banking Sector

FINTECH : DISRUPTIONS IN THE GLOBAL FINTECH SCENARIO

The School of Management and Commerce had invited Mr Amit Pradhan - Vice President from the London Institute of Baning and Finance (LIBF) to give a guest lecture on "Role of Fintech in Banking Sector" on September 18, 2023. This session was attended by First Semester students of BBA and MBA First and Third semester students. The speaker talked about recent trends in the Fintech industry across the globe. He discussed very innovative topics like Embedded finance, UPI Payments, Neo Bankingk, BNPL and Generative AI. The session was very informative and students interacted with esteemed guest very actively.

The Vote of thanks was proposed by the HOD - Dr Tanushri Purohit .

Resource Person : Dr Sunil Kadyan



SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

EVENT REPORT

TITLE: "Role of Flow Structures in Heat Transfer Enhancement"

Date: 25th July 2023

Venue: HF-03

Time: 11:30 am

Speaker: Dr. Naveen Sharma, Assistant Professor at the Department of Mechanical Engineering, Netaji Subhas University of Technology, New Delhi.

Total Participants: 15

Dr. Naveen Sharma is an Assistant Professor at the Department of Mechanical Engineering, Netaji Subhas University of Technology, New Delhi. He received his PhD in Thermal Engineering from Indian Institute of Technology Roorkee (2018), M. Tech. in CFD & HT from NIT Hamirpur (2011) and BE in Mechanical Engineering from MDU university (2009). He has over 4 years of teaching and research experience in the field of Mechanical Engineering. He has authored/co-authored over 40 international publications including, journal articles, conference proceedings, and book chapters. Dr. Sharma is actively involved with the use of optical techniques, namely Liquid Crystal Thermography and Particle Image Velocimetry in heat transfer and fluid flow research. He shares his experiences of research and the nest possible ways to begin with it.

He further discussed heat transfer enhancement of forced internal single-phase flow enabled by additively manufactured internally finned channels. Which are considered for internal liquid coolant flow through a tube with constant heat flux applied to the exterior surface. The thermal resistance for laminar flow or convection thermal resistance for turbulent flow are discussed.

The meeting was opened to questions from students and faculty towards the end of the talk. After this Prof. (Dr.) Ajit delivered the vote of thanks to the speaker, wishing him for a bright future.

Speaker enlightening the session

Speaker enlightening the session

Faculty presenting token of appreciation

MANAV RACHNA CENTRE FOR PEACE AND SUSTAINABILITY

Canva workshopfor freshers to learn AI designing

Title: Canva workshopfor freshers to learn AI designing

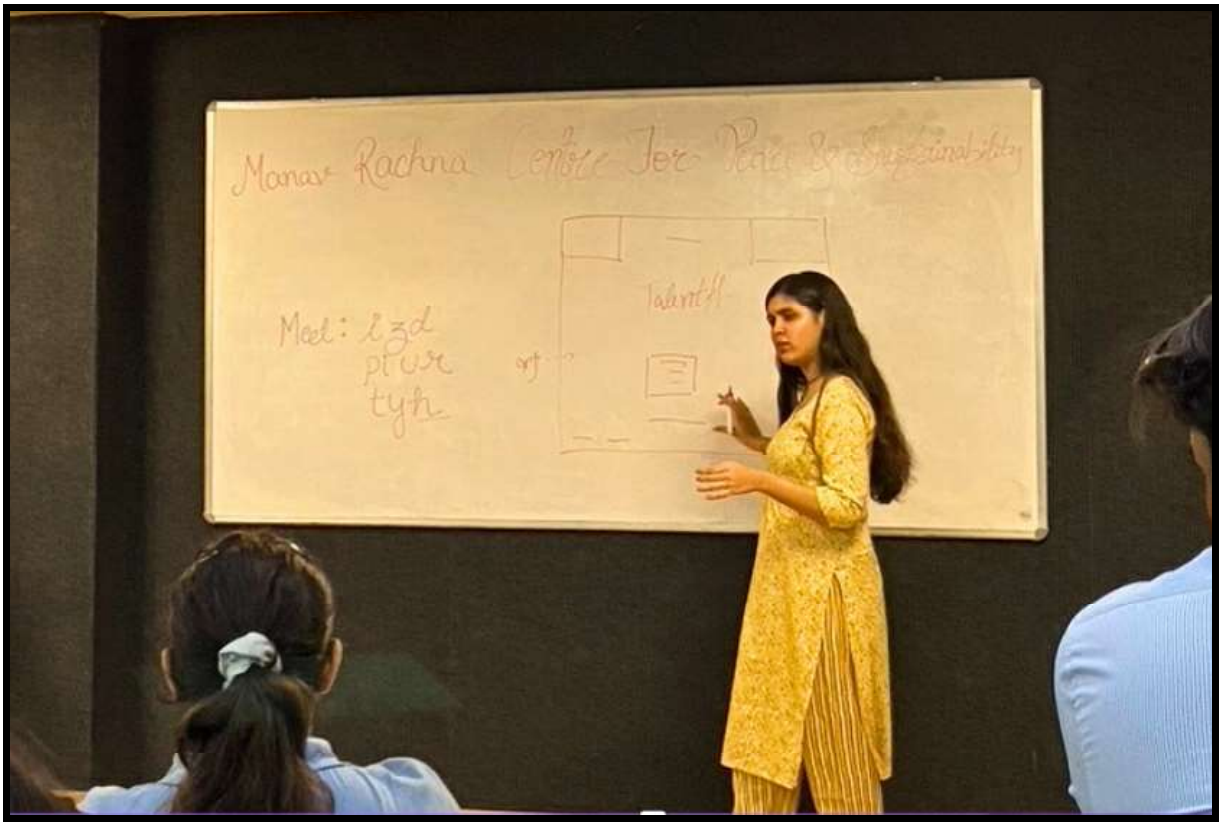
Date: July 27, 2023

Venue: J block JS02, Manav Rachna University

The Manav Rachna Centre for Peace and Sustainability recently hosted an interactive workshop focused on hand-based flyer design, a creative endeavor led by Ms. Avni Bhatia. The workshop drew the participation of both enthusiastic freshers and members of the creative team, creating a diverse and engaging learning environment. Ms. Bhatia's expertise shone as she delved into essential design principles, color theory, and typography, providing participants with a solid foundation for practical application.

Throughout the session, attendees were guided in creating captivating layouts and encouraged to experiment with various design elements. The workshop's emphasis on interactive learning fostered a collaborative atmosphere, allowing participants to exchange ideas and insights. The culmination of the event saw participants putting their newfound skills into action, crafting effective and visually appealing flyers that showcased their creativity and understanding of design concepts. This workshop not only reflected the commitment of Manav Rachna to innovative expression but also underscored the institution's dedication to providing hands-on learning experiences that nurture creativity.

The resounding success of the workshop serves as a testament to the importance of practical, hands-on learning in the realm of creativity. As Manav Rachna continues to champion innovative approaches to education, events like these contribute significantly to the holistic development of its students, preparing them for real-world applications of their skills and fostering a culture of creative excellence.



Students learning format of the flyer

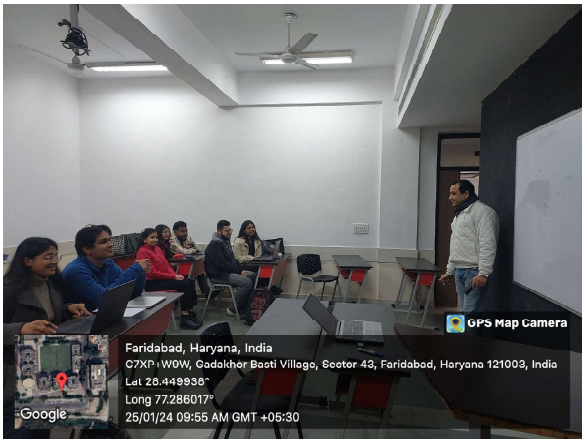
Interaction with expert

WORKSHOPS & TRAININGS

Data Analytics Workshop using Python

The Data Analytics Workshop using Python was organized for MBA Business Analytics (BA) Sem IV students at Manav Rachna University (MRU) from January 24 to January 25, 2024. The workshop was conducted by Mr. Shiv Kumar Singh Pundhir, Assistant Professor at the School of Management and Commerce (SoMC), MRU. The objective of the workshop was to equip students with practical skills in data analytics using Python, a highly versatile and widely-used programming language in the field.The workshop was well-received by the participants, who appreciated the practical approach and the clarity of instruction provided by Mr. Shiv Kumar Singh Pundhir. The interactive sessions and hands-on practice were particularly highlighted as beneficial aspects of the workshop. The students left with a stronger foundation in data analytics and greater confidence in using Python for their academic and professional pursuits.

In conclusion, the Data Analytics Workshop using Python was a successful initiative that significantly contributed to the students' learning and skill development in the domain of data analytics.



CDSL SEMINAR

School of Management and Commerce in association with Central Depository Services Limited (CDSL) organized a workshop focusing on the fundamentals of investments and depository services on 25th April 2024 at IG03. The workshop aimed to educate students about the importance of investing wisely and utilizing depository services effectively. The session was taken by **Dr. Shikha Gupta, SMART Trainer SEBI**. The sessions were organised and

coordinated by **Dr. Rashi Banerji**, Assistant Professor, SMC, MRU, and a total of **100 Bachelor of Business Administration** students benefitted from the session. **Dr. Parul Jhajharia**, Dean, SMC welcomed and felicitated the guest with a planter.

The workshop addressed following topics:

- Introduction to Investments
- Understanding Different Investment Avenues
- Role of Depository Services in Investments
- Benefits of Depository Services
- Practical Demonstrations and Case Studies

The workshop commenced with an introduction to the basics of investments, including the significance of financial planning and the different types of investment options available in the market. Participants gained insights into various investment avenues such as stocks, bonds, mutual funds, and other financial instruments.

A significant portion of the workshop was dedicated to elucidating the role of depository services in modern investment practices. The facilitators elaborated on how depository services streamline the process of buying, selling, and holding securities electronically, thus eliminating the need for physical certificates and enhancing efficiency and security in transactions.

The workshop concluded with an interactive Q&A session, allowing participants to seek clarification on any doubts or queries they had regarding investments and depository services. The CDSL workshop on the basics of investments and depository services provided attendees with valuable knowledge and insights essential for making informed investment decisions. By demystifying complex financial concepts and emphasizing the importance of leveraging depository services, the workshop contributed to empowering students to navigate the world of investments with confidence and competence.


CDSL
MANAV RACHNA UNIVERSITY
SMC
CERTIFICATE
OF PARTICIPATION
THIS CERTIFICATE IS GIVEN TO
Arpit Kumar
for their participation in CDSL Seminar organized by School Of Management and Commerce, MRU held on 25th April,2024.
Dr. Rashi Banerji
Assistant Professor, SMC
Prof.(Dr).Parul Jhajharia
Dean(SMC)


GPS Map Camera
Faridabad, Haryana, India
I-Block, Manav Rachna Campus Rd, Gadakhor Basti Village, Rocky Area, Faridabad, Haryana 121003, India
Lat 28.450055°
Long 77.285916°
25/04/24 09:58 AM GMT +05:30
Google


MANAV RACHNA UNIVERSITY
SMC
CDSL
SEMINAR
ON Basics of Investments & Depository Services
25 APRIL, 2024
10:00 AM
IGO3
DR. SHIKHA GUPTA
FINANCIAL EXPERT
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Students & Faculty Projects

Real-Time Vehicle Tracking System

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Abstract- Our idea is to develop an innovative and automated real-time vehicle training system that mainly focuses on public buses. The app software will comprise connectivity of services like GPS tracker and Geographic Information System (GIS). Our approach is that first we will collect location coordinates from the GPS tracker and we will be storing these coordinates data in our cloud server using the cloud server address and API. Now we have to show the location of the public buses with the marker on Google map. So, we will fetch the coordinates data from the cloud server and integrate this into our app software. We will also connect Google Maps using a maps API essential credential. Now talking about our app software, we have given some useful features:
Users will be able to track the public bus and get an idea when it will come or if the bus is stuck in traffic, it will give an estimated arrival time and traffic information. Moreover, users will be able to get route information where there is a problem in the route. It will help in enhancing the user experience.

Keywords- Real-time Vehicle Tracking, GPS, Vehicle Tracking, Bus Tracking.

Introduction

Buses are road vehicles that carry more passengers than regular cars or trucks. It is most commonly used in public transportation. Every day, more than 25 million people use public transport (buses) for comfort. Irregular bus schedules and late arrivals make it difficult for people to reach their destinations. Our project and research work focuses on this issue.

This project introduces real-time bus tracking designed to revolutionize the public transportation experience. Leveraging advanced GPS technology and Geographic Information System (GIS) integration, the system provides passengers with real-time bus tracking, route planning, traffic information, and Estimated Time of Arrival (ETA). Passengers can easily track the exact location of public buses, access detailed route information, and receive up-to-the-minute ETAs through user-friendly interfaces such as the app mobile and web platforms. Integrating real-time traffic data into the system ensures buses follow optimized routes, thereby minimizing delays and improving overall operational efficiency.

Additionally, this project emphasizes sustainability and environmental responsibility by reducing traffic congestion and fuel consumption. It also provides transportation authorities with valuable data analytics tools to make informed decisions about ridership, service optimization, and maintenance requirements. Integrating real-time traffic data further enhances the system's capabilities. By dynamically adjusting routes based on current traffic conditions, the project will minimize delays and optimize travel time. This not only improves passenger satisfaction but also contributes to the sustainability of public transport by reducing fuel consumption and emissions. Real-time bus tracking and route planning system not only provides passengers with greater convenience but also contributes to an efficient, sustainable, and data-driven urban transportation system. This innovative solution represents an important step towards a smarter, more accessible, and user-centric public transport network.

Objective

- Real-time tracking of buses for ease of public.
- User should get the traffic information regarding a particular route or on route on which they are travelling.

- Expected Arrival Time (ETA) should also be there so that the people get to know when their bus will arrive.
- To make a user-friendly application and web software for real time tracking of buses.

Literature review:

1. The thesis [1] focuses on designing a vehicle tracking system using GPS and GSM technology. The system will be primarily focused on tracking a Solar Assisted Rickshaw Van using an Arduino Uno R3 and GSM module sim908. The Arduino Uno R3 is interfaced to a GSM modem and GPS receiver, which sends the vehicle's position from a remote location. The GPS modem uses satellite technology for navigation, providing data like longitude, latitude, speed, and distance traveled. When a user sends a request via SMS, the system automatically sends a response to the mobile. The vehicle's position will also be displayed on a Google Map using software XAMPP and Google Map API. XAMPP is a free and open-source web server solution stack package, while Google Maps API embeds Google Maps onto web pages using a JavaScript interface. The MySQL database stores GPS data, and the Google Map API displays location information. The system will also allow for vehicle control in case of theft.

2. Real-time highway traffic monitoring systems [2] are crucial for managing traffic and preventing accidents. These systems rely on online traffic flow information from vehicle trajectories. General-purpose object detectors like Yolo, SSD, and EfficientNet are used, but their average vehicle classification accuracy is below 57%. This study proposes improving Yolo's classification accuracy and developing a novel bounding box-based vehicle tracking algorithm. A new vehicle dataset was prepared by annotating 7216 images with 123831 object patterns from highway videos. Nine machine learning-based classifiers and a CNN-based classifier were selected, and one out of ten with the highest accuracy was combined with Yolo. The Yolo-based vehicle detector's classification accuracy was increased from 57% to 95.45%. Vehicle detectors 1 and 2 were applied to categorical/total vehicle counting tasks on 4 highway videos. The developed approach improved vehicle counting accuracy by 13.25%, outperforming other systems.

3. Shanghai Grid (SG) [3] is implementing intelligent transportation systems to improve traffic conditions. One challenge is accurately locating moving vehicles in real time. An innovative scheme, HERO, is proposed to address this issue. HERO logs vehicle location information in local nodes, updating it only in nearby nodes. By limiting the number of hops for queries, HERO ensures real-time constraints for each vehicle. Extensive simulations and trace data from Shanghai demonstrate the efficacy of HERO.

4. Vehicle tracking, monitoring [4], and alerting systems are challenging due to issues with real-time vehicle location and alerting systems. GPS is the most widely used technology for tracking and monitoring vehicles, while RFID is used for bus monitoring. GSM is the most widely used for alerting systems, providing location and vehicle information to passengers, owners, or users. These systems aim to manage and control transport using GPS transreivers and RFID technology.

5. Vehicle tracking systems [5] use GPS to locate vehicles in real-time, providing accurate location information. This project uses IoT to achieve better results than conventional methods. The system interfaces with buses using OBD/CAN interfaces and communicates parameters to a central server using wireless sensor network technology.

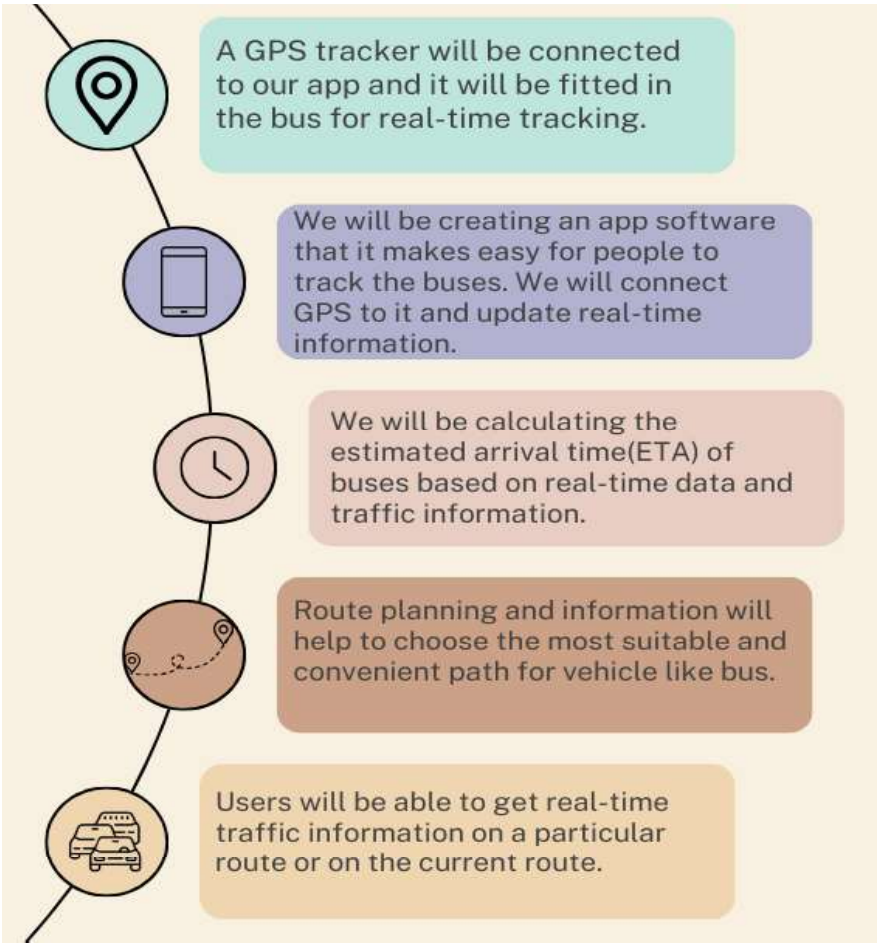
6. This paper [6] presents an algorithm for tracking vehicles through an image sequence using a model based on the characteristic edges of an intensity image. The algorithm uses Kalman filtering to control model position and scale, a multiple hypotheses strategy to avoid mismatches to local edges with similar structures, and dynamically adapting each model to the vehicle it is matched to. These refinements contribute to better overall performance of the tracking algorithm. The method can track vehicles in real-time with off-the-shelf processing capabilities and can track objects in ambiguous situations. Experiments based on practical data are presented to support these conclusions.

7. The thesis [7] focuses on designing a vehicle tracking system using GPS and GSM technology. The system will be primarily focused on tracking a Solar Assisted Rickshaw Van using an Arduino Uno R3 and GSM module sim908. The Arduino Uno R3 is serially interfaced to a GSM modem and GPS receiver, which sends the vehicle's position from a remote location. The GPS modem uses satellite technology for navigation, providing data like longitude, latitude, speed, and distance traveled. When a user sends a request via SMS, the system automatically sends a response indicating the vehicle's position via SMS. The position of the vehicle will be displayed on a Google Map using software via the internet. The system will also allow for controlling the vehicle if it is stolen. The GPS and Google Map API will be used to provide real-time location information and enhance the tracking process.

Methodology

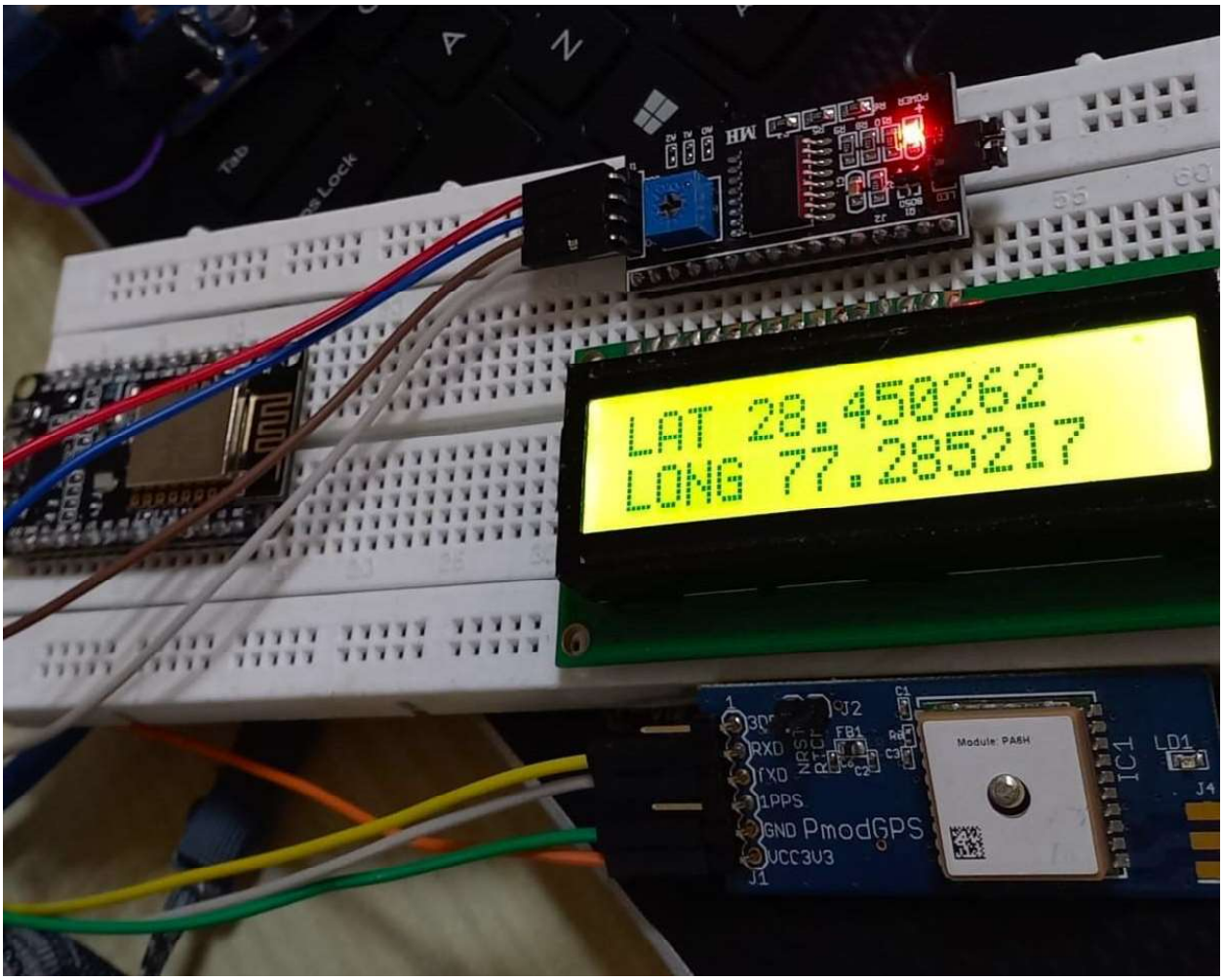
Buses are road vehicles that carry more passengers than regular cars or trucks. It is most commonly used in public transportation. Every day, more than 25 million people use public transport (buses) for comfort. Irregular bus schedules and late arrivals make it difficult for people to reach their destinations.

To achieve this, we proposed an idea wherein there will be app or web software for the best user experience. This process involves several steps, each of which plays a crucial role in ensuring accurate and real-time tracking of vehicles or assets.



Step 1: GPS Connection

The first step in this process involves establishing a connection between the GPS device and the Trackit app. The GPS (Global Positioning System) is a satellite-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. In the context of vehicle tracking, the GPS device is typically installed in the vehicle and is responsible for determining the vehicle's current location. This is achieved by calculating the time delay between the transmission and reception of signals from multiple GPS satellites. Once the GPS device has determined its location, it then connects to the Trackit app. This connection can be established using various communication technologies such as cellular networks, Wi-Fi, or even satellite communication in some advanced systems.



Step 2: Data Transmission

After establishing a connection with the Trackit app, the next step is data transmission. In this step, the GPS coordinates determined by the GPS device are sent to a cloud database. The term “cloud” refers to servers that are accessed over the Internet, and the software and databases that run on those servers. By using cloud technology, users can access software and servers located anywhere in the world. Data transmission typically occurs in real-time or at regular intervals, depending on the specific requirements of the tracking system. For example, a delivery company might require real-time tracking to monitor their delivery trucks closely, while a car rental company might only need updates every few minutes.

Step 3: Data Retrieval

Once the data has been transmitted to the cloud database, it needs to be retrieved so that it can be used by the Trackit app. This process is known as data retrieval. During data retrieval, the Trackit app communicates with the cloud database to fetch the latest GPS coordinates. This communication is typically facilitated through APIs (Application Programming Interfaces), which allow different software applications to interact with each other.

Step 4: Update on App

The final step in this process is updating the location information on the Trackit app. Once the app has retrieved the latest coordinates from the cloud database, it updates its display to reflect this new information. This allows users to view fleet locations in real-time on their mobile devices or computers. Depending on the features offered by the tracking system, users might also be able to view historical location data, set up geofences (virtual boundaries), receive alerts for specific events (like a vehicle entering or leaving a designated area), and generate reports.

In conclusion, this process methodology enables real-time tracking of any vehicle in your fleet from a mobile device or computer. It’s important to note that actual implementation details might vary based on specific use cases and configurations. For more precise information, you may want to refer to official documentation or support resources of your tracking system.

3.1. GPS installation and data collection

The GPS tracking process involves a series of meticulously arranged steps. It starts with a GPS device, typically installed in the vehicle, that consistently collects real-time location data, including precise latitude and longitude coordinates.

3.2. Setting up communication

The collected data is then relayed to a dedicated mobile application on a smartphone or tablet via cellular or satellite communications, which serves as the user interface for real-time monitoring.

3.3. User interface

The mobile app supports processing incoming location data, which can include tasks such as data formatting, timestamping, and data filtering to ensure accuracy. Processed data is temporarily stored on the mobile device before being sent to a cloud-based server, the central part of this process. The cloud server, equipped with software and databases, serves as an effective data center, receiving, storing, and managing the stream of location data. Here, GPS coordinates and related information, which can include timestamps and vehicle identification, are meticulously organized and accessible to the app.

The mobile app's user-friendly interface provides a real-time display of GPS coordinates, often depicted on a map with location markers and visualizations. To ensure up-to-date tracking information, the app periodically retrieves the latest coordinates from a cloud-based server at regular intervals of time.

Users can interact with the app not only to view real-time location data, but also explore historical tracking records, configure alert systems, or engage in other actions that allow them to Effectively monitor and manage the vehicle being tracked. Additionally, the system can provide reporting and analytics capabilities, allowing users and administrators to better understand vehicle movements, routes, and performance. This comprehensive approach ensures the accuracy, accessibility, and efficiency of real-time GPS tracking, making it a valuable tool for a variety of applications ranging from fleet management to personal location services.

Conclusion

The project aims to revolutionize public transportation by introducing real-time bus tracking. Utilizing advanced GPS technology and Geographic Information System (GIS) integration, the system offers passengers real-time bus tracking, route planning, traffic information, and Estimated Time of Arrival (ETA). This user-friendly interface allows passengers to track the exact location of public buses, access detailed route information, and receive up-to-the-minute ETAs. The integration of real-time traffic data ensures buses follow optimized routes, minimizing delays and improving operational efficiency. The project also emphasizes sustainability and environmental responsibility by reducing traffic congestion and fuel consumption. It provides transportation authorities with valuable data analytics tools for informed decisions about ridership, service optimization, and maintenance requirements. By dynamically adjusting routes based on current traffic conditions, the project minimizes delays and optimizes travel time, improving passenger satisfaction and contributing to the sustainability of public transport by reducing fuel consumption and emissions. This innovative solution represents a significant step towards a smarter, more accessible, and user-centric public transport network.

References:

S. Ahmed, A. K. M. Abdul, and M. Azad, “Real-Time Vehicle Tracking System,” 1212.

J. Azimjonov and A. Özmen, “A real-time vehicle detection and a novel vehicle tracking systems for estimating and monitoring traffic flow on highways,” *Advanced Engineering Informatics*, vol. 50, Oct. 2021, doi: 10.1016/j.aei.2021.101393.

2008 Proceedings IEEE INFOCOM. I E E E, 2008.

S. S. Dukare, D. A. Patil, and K. P. Rane, “Vehicle Tracking, Monitoring and Alerting System: A Review,” 2015.

K. Hemachandran, S. Tayal, G. S. Kumar, V. Boddu, S. Mudigonda, and M. Emudapuram, “A Technical Paper Review on Vehicle Tracking System,” in *Lecture Notes on Data Engineering and Communications Technologies*, vol. 49, Springer Science and Business Media Deutschland GmbH, 2020, pp. 698–703. doi: 10.1007/978-3-030-43192-1_77.

J. Van Leuven, M. B. Van Leeuwen, and F. C. A. Groen, “Real-Time Vehicle Tracking in Image Sequences.”

C. K. Gomathy, C. Reddy, and B. Yaswanth Nikhil Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya, “THE REALTIME VEHICLE TRACKING SYSTEM International Journal of Scientific Research in Engineering and Management (IJSREM) THE REALTIME VEHICLE TRACKING SYSTEM,” 2021, [Online]. Available: www.ijsrem.com

SMART INDIA HACKATHON 2024

Problem Statement ID – 1629

Problem Statement Title - Freelancing Platform

Theme - Smart Education

PS Category- Software

Team ID-

Team Name – NvM

A FREELANCING PLATFORM

@SIH Idea submission- Template

Purpose: A platform connecting freelancers from different fields with project opportunities, simplifying collaboration for clients and professionals.

Features:

Freelancer Profile and Portfolio Management

Rating and review system for completed project

Ensures quick payments using UPI

Enable extensive search and AI insights for job seekers and employers

Multi-lingual interface.

ESCROW for protection of freelancer from exploitation.

Helping users with a smart chatbot

Supports niche professions and enhances

freelancing experience.

TECHNICAL APPROACH

Escrow Logic and

Payment Logic

Set Up the Backend Environment

and connecting database

Project Structure, Designing of

UI, Styling of the Pages

1. Frontend

Development

4. Payment

Integration and

Escrow System

2. Backend

Development

Develop AI Recommendation

System

5. Search and AI

Recommendations

Job Posting and Listing,

Profile Management,

3. Job

Marketplace

Features

SDG-8

ROADMAP

FEASIBILITY AND VIABILITY

@SIH Idea submission- Template

How We Are Different?

Nationwide Reach

Personalized Experience

Minimal Platform Fee

Secure Transactions

Multilingual support attracts clients and freelancers from across the country.

The simple interface ensures quick access to features and services.

The fee deduction for both freelancers and clients is just 2%, significantly lower than the 10% to 12% charged by other platforms.

A mandatory escrow system
ensures safe payments.

Market
FEASIBILITY VIABILITY

The platform caters to a
significant audience who is
looking for job or side gig.

Financial
The platform can generate
sufficient revenue to cover its
costs and achieve profitability.

Competitive
The platform can differentiate
itself from competitors and
maintain advantage.

Economic
The platform can be developed
and maintained within a
modest budget.

Legal
There are no significant legal
orregulatory hurdles to
prevent the platform's
development and operation.

Technical

The platform's technology and design are flexible to fit different needs.

IMPACT AND BENEFITS

@SIH Idea submission- Template

EMPOWERMENT

ECONOMIC GROWTH

Provides opportunities for all skill levels, from students to professionals.

Boosts employment by connecting freelancers with diverse job opportunities.

CAREER GROWTH

Offers AI-driven insights for skill development and marketability.

FREELANCERS

Access to a wide
range of short-term
and project-based

jobs.

EMPLOYERS

Streamlined access
to skilled freelancers
for project-based

work.

GIG ECONOMY

Contributes to the
gig economy,
increasing overall
economic activity

RESEARCH AND REFERENCES

@SIH Idea submission- Template

References:

[1] Rabino, C. (2019). The rise of the freelance economy. ResearchGate, 10(13140), 12070-68165.

[2] A Global Survey on Freelancing

PATENTS

Robot for Air Conditioner Duct Cleaning

Shalu Singh, Anupriya Anupriya, Poonam Poonam, Narender Ranga, Priya Saharan & Vinit Kumar	U.K. Design Patent 6304988

A compact robot designed for cleaning AC ducts internally.Equipped with rotating brushes, suction, and camera sensors.Navigates ducts autonomously while removing dust and debris.Improves indoor air quality and reduces manual effort.

Enhanced Multi-Beam Interference Utilizing Modified Lens System

Dinesh kumar sharma	202311047089A

An optical system designed for improved multi-beam interference accuracy.

Uses advanced lens configurations to control diffraction patterns.

Enhances imaging precision for laser, photonics, or microscopy.

Offers better optical resolution and energy efficiency.

Synthesis and Utilization of Graphene Sheet with Periodic Vacancy for Hydrogen Storage

Jaiparkash, Deepti Maihuri, Shiv Kumar Dixit, Haider Abbas	202311064446A

Develops graphene structures engineered with periodic atomic vacancies.

Increases hydrogen adsorption capacity and stability.

Supports energy storage for clean hydrogen-based technologies.

Provides a step toward sustainable fuel alternatives.

Seat Belt with Heart Rate Recognition for Ignition of Vehicle

Dr. Piyush Charan,Dr. Anshuman Sahai, Dr. Somya Asthana, Dr. Deepti Maikhuri, Dr. Joginder Singh, Dr. Moditma	398635-001

Smart seat belt integrating biometric sensors for driver verification.

Monitors heart rate before vehicle ignition and during driving.

Prevents ignition if abnormal heart activity is detected.

Enhances vehicle safety through integrated health monitoring.

Portable Computer Tab

Dr. Umesh Kumar Singh Dr. Tarun Kumar Rajak **Dr. Piyush Charan** Dr Krishna Kumar Singh Dr. Sushil Kumar Jamariar Mr. Ajay Kumar Mrs. Shabana Sheikh	393644-001

Lightweight tablet computer for work and educational purposes.
Combines processing power with portability and touchscreen input.
Supports connectivity and cloud-based applications.
Useful for professionals and students on the go.

Seat Belt with Heart Rate Recognition for Ignition of Vehicle

Dr. Piyush Charan Dr. Anshuman Sahai Dr. Somya Asthana Dr. Deepti Maikhuri Dr. Joginder Singh Dr. Moditma	398635-001

Integrates biometric recognition with vehicle ignition system.Monitors driver’s pulse rate to ensure alertness before driving.Prevents unauthorized or unsafe vehicle operation.Promotes health-conscious and secure driving environments.

IoT Driven Sensor Network Alert System for Detection of Hydrogen Gas Leakage

Dr. Charu Pathak Dr. Piyush Charan Dr. Joginder Singh	202311039870

Smart IoT-based sensor grid for detecting hydrogen gas leaks.

Continuously monitors pipelines or storage areas for leakage.

Sends instant alerts to prevent accidents or explosions.

Enhances industrial safety and environmental protection.

Cloud Computing Based Digital Forensic Investigation System Implemented with Machine Learning Configurations

1. Sen, Arijeet Chandra, Ambala Cantt, Haryana, IN 2. Indoria,Devadutta,Jeypore,Odisha,IN **3. Charan,Piyush,Faridabad, Haryana, IN** 4. Byeon, Haewon,Gimhae,KR 5. Keshta, Ismail, Riyadh, SA 6. Karmode,Sayali, Navi Mumbai, Maharashtra, IN	20 2024 102 105

A secure cloud-based platform for digital evidence analysis.Uses machine learning to detect anomalies and classify cyber incidents.Ensures data integrity through encryption and access control.Aids law enforcement and cybersecurity professionals in investigations.

FACULTY DEVELOPMENT PROGRAM

School	Year	FDP Title
SOL	2023	SPSS Techniques
SOL	2023	SPSS Techniques
SOL	2023	SPSS Techniques
SOL	2023	Faculty Development Program

RESEARCH PUBLICATIONS

Fuzzy Local Information C-Means based Clustering and Fractional Dwarf Mongoose Optimization Enabled Deep Learning for Relevant Document Retrieval

Gunjan Chandwani	Fuzzy Local Information C -Means based Clustering and Fractional Dwarf Mongoose Optimization Enabled Deep Learning for Relevant Document Retrieval

Integrates fuzzy clustering with metaheuristic optimization for document relevance.
Uses deep learning for semantic understanding and retrieval accuracy.
Fractional Dwarf Mongoose Optimization fine-tunes network parameters.
Improves efficiency and precision in large-scale document retrieval systems.

MissingFoundBlock: Blockchain System to File Missing and Found FIRs

Parneeta Dhaliwal	MissingFoundBlock: Blockchain System to File Missing and Found FIRs

Proposes a blockchain-based system for transparent FIR management.
Ensures data integrity and traceability in missing and found reports.
Smart contracts automate case handling and record updates.
Enhances public trust and efficiency in law enforcement systems.

Dimension Reduction in the Sagittal Plane for Diagnosis of Mild Cognitive Impairment

Harsh Bhasin	Dimension Reduction in the Sagittal Plane for Diagnosis of Mild Cognitive Impairment

Uses sagittal plane imaging to extract brain region features.
Applies dimension reduction for efficient pattern analysis.
Supports early detection of mild cognitive impairment (MCI).
Facilitates faster, data-efficient medical diagnosis.

Systematic Review of the Association between Cancer-Related Dementia and Mality: Systematic Review and Meta-Analysis

Yojna Arora	Systematic Review of the Association between Cancer-Related Dementia and Mality: Systematic Review and Meta-Analysis

Reviews clinical studies linking cancer-related dementia and malignancy.
Performs statistical meta-analysis for consistency across findings.
Highlights neurocognitive decline among oncology patients.
Suggests clinical pathways for managing dual morbidities.

Fire Alarm System Through Smoke Detection

Yojna Arora	Fire Alarm System Through Smoke Detection

Develops an intelligent smoke-based fire detection mechanism.
Integrates sensors with microcontroller-driven alert systems.
Ensures early fire identification and safety measures.
Reduces human and material loss through real-time alerts.

A Language Lending Itself: Mapping Clusters of Contextually Close Cognates in Indo-European Languages

Manpreet Kaur	A Language Lending Itself: Mapping Clusters of Contextually Close Cognates in Indo-European Languages

Explores cognate relationships in Indo-European linguistics.
Applies clustering to identify contextually close word groups.
Visualizes semantic and phonetic similarities across languages.
Aids in historical linguistics and etymological research.

Intrusion Detection System for IoT-Based Healthcare Intrusions with Lion-Salp-Swarm-Optimization Algorithm: Metaheuristic-Enabled Hybrid Intelligent Approach

Deepti Thakral	Intrusion Detection System for IoT-Based Healthcare Intrusions with Lion-Salp-Swarm-Optimization Algorithm: Metaheuristic-Enabled Hybrid Intelligent Approach

Proposes an IDS framework for IoT healthcare environments.
Uses Lion-Salp-Swarm-Optimization for feature selection.
Combines hybrid intelligence to improve threat detection.
Enhances data security and patient privacy in IoT systems.

Handling Illumination Variation for Motion Detection in Video Through Intelligent Method: An Application for Smart Surveillance System

Manoj Kumar & Susmita Ray	Handling Illumination Variation for Motion Detection in Video Through Intelligent Method: An Application for Smart Surveillance System

Addresses motion detection under varying lighting conditions.
Employs adaptive image enhancement and filtering techniques.
Integrates AI models for robust object movement detection.
Optimizes smart surveillance reliability in dynamic lighting.

A Walk-through towards Network Steganography Techniques

Urmila Pilania & Manoj Kumar	A Walk-through towards Network Steganography Techniques

Provides an overview of modern network steganography methods.
Explains data hiding in communication protocols and packets.
Analyzes security threats and detection mechanisms.
Offers insights for counter-steganographic defense strategies.

Impounding Behavioural Connotations for Hate Speech Analysis – A View Towards Criminal Investigation using Machine Learning

Parneeta Dhaliwal	Impounding Behavioural Connotations for Hate Speech Analysis – A View Towards Criminal Investigation using Machine Learning

Uses ML techniques to detect hate speech patterns.
Analyzes linguistic behavior for forensic investigation.
Incorporates contextual emotion and intent analysis.
Supports law enforcement in online crime prevention.

Preserving Security in Internet-of-Things Healthcare System with Metaheuristic-Driven Intrusion Detection

Deepti Thakral	Preserving Security in Internet-of-Things Healthcare System with Metaheuristic-Driven Intrusion Detection

Develops a metaheuristic-optimized IDS for IoT healthcare.
Enhances detection accuracy against complex cyber threats.
Ensures secure transmission of sensitive patient data.
Improves resilience of connected healthcare infrastructure.

Effectiveness of Higuchi Fractal Dimension in Differentiating Subgroups of Stressed and Non-Stressed Individuals

Goldie Gabrani	Effectiveness of Higuchi Fractal Dimension in Differentiating Subgroups of Stressed and Non-Stressed Individuals

Applies Higuchi fractal dimension to analyze EEG signals.
Differentiates between stressed and non-stressed individuals.
Quantifies complexity in brain activity patterns.
Demonstrates potential for mental health monitoring.

Smart Cities Development using Blockchain Technology in India: A Critical Analysis

Sanjay Singh	Smart Cities Development using Blockchain Technology in India: A Critical Analysis

Examines blockchain's role in India's smart city initiatives.
Highlights benefits in governance, transparency, and data sharing.
Analyzes policy, infrastructure, and scalability challenges.
Proposes strategic frameworks for nationwide implementation.

Performance Evaluation of LSB Steganography Based on Multiple Image Formats

Urmila Pilania & Manoj Kumar	Performance Evaluation of LSB Steganography Based on Multiple Image Formats

Tests LSB steganography across various image formats.
Evaluates embedding capacity, imperceptibility, and robustness.
Compares results on PNG, JPEG, and BMP images.
Finds optimal conditions for secure data hiding.

A Novel Approach for Hand-Written Digit Classification Using Deep Learning

Tamanna Sachdeva	A Novel Approach for Hand-Written Digit Classification Using Deep Learning

Implements a deep neural network for digit recognition.
Utilizes convolutional layers for pattern extraction.
Achieves high accuracy on datasets like MNIST.
Demonstrates efficiency in handwritten data classification.

An Efficient Meta-Heuristic Algorithm Based on Water Flow Optimizer for Data Clustering

Jyoti Pruthi, Sanjay Singh	An Efficient Meta-Heuristic Algorithm Based on Water Flow Optimizer for Data Clustering

Introduces a water flow-inspired metaheuristic for clustering.
Optimizes data partitioning with adaptive flow dynamics.
Balances exploration and exploitation during learning.
Improves accuracy and convergence in clustering problems.

Decision Tree Regression Analysis of Proposed Metric Suite for Software Fault Prediction

Jyoti Pruthi	Decision Tree Regression Analysis of Proposed Metric Suite for Software Fault Prediction

Uses regression trees to evaluate software fault metrics.
Identifies key indicators affecting defect occurrence.
Supports early fault prediction and code quality assurance.
Improves reliability of software project management.

Segmentation and Classification of Diabetic Retinopathy using Ensemble Deep Neural Network

Mrinal Pandey	Segmentation and Classification of Diabetic Retinopathy using Ensemble Deep Neural Network

Develops an ensemble DNN for retinal image analysis.
Performs segmentation and grading of diabetic retinopathy.
Improves accuracy through model fusion and feature learning.
Aids in automated ophthalmic diagnosis systems.

Checking Counterfeit Critiques on Commodities using Ensemble Classifiers Enhancing Information Credibility

Ram Chatterjee & Mrinal Pandey	Checking Counterfeit Critiques on Commodities using Ensemble Classifiers Enhancing Information Credibility

Detects fake product reviews using ensemble ML models.
Analyzes linguistic and behavioral cues for authenticity.
Integrates multiple classifiers for credibility scoring.
Promotes transparency in e-commerce consumer feedback.

Optimizing Software Fault Prediction using Decision Tree Regression and Soft Computing Techniques

Jyoti Pruthi	Optimizing Software Fault Prediction using Decision tree Regression and Soft Computing Techniques

Combines regression and soft computing for fault estimation.
Applies fuzzy logic and hybrid optimization for accuracy.
Identifies software vulnerabilities during development.
Supports predictive maintenance in large codebases.

A Novel Hybrid Deep Belief Google Network Framework for Brain Tumor Classification

Urmila Pilania	A Novel Hybrid Deep Belief Google Network Framework for Brain Tumor Classification

Proposes a hybrid Deep Belief + GoogleNet architecture.
Extracts deep features from MRI brain images.
Classifies tumor types with high precision and recall.
Enhances diagnostic support in medical imaging.

A Multi-Layered Assessment System for Trustworthiness Enhancement and Reliability for Industrial Wireless Sensor Networks

Shalu	A Multi-Layered Assessment System for Trustworthiness Enhancement and Reliability for Industrial Wireless Sensor Networks

Designs a multi-tier trust evaluation model for IWSNs.
Assesses node reliability and communication integrity.
Integrates security and fault-tolerance layers.
Improves trust and resilience in industrial IoT systems.

Exploring Transboundary Solutions for Forensic Investigations: An Interdisciplinary Approach to Addressing Criminal Behavioral Challenges

Parneeta Dhaliwal & Sanjay Singh	Exploring Transboundary Solutions for Forensic Investigations: An Interdisciplinary Approach to Addressing Criminal Behavioral Challenges

Analyzes cross-border collaboration in forensic practices.
Integrates psychology, law, and technology for crime analysis.
Addresses behavioral complexities in transnational crimes.
Promotes unified frameworks for global forensic cooperation.

A Novel Three-Phase Hybrid Cryptographic Algorithm for Data Security

Shalu	A Novel Three-Phase Hybrid Cryptographic Algorithm for Data Security

Combines symmetric, asymmetric, and hashing cryptography.
Provides multi-layer encryption for enhanced security.
Balances speed, strength, and computational efficiency.
Ensures data protection in cloud and network systems.

A Framework for Detection of Drone using YOLOv5x for Security Surveillance System

Manoj Kumar & Urmila Pilania	A Famework for Detection of Drone using YOLOv5x for Security Surveillance System

Implements YOLOv5x for real-time drone detection.

Applies deep learning for aerial object identification.
Enhances security monitoring in restricted airspaces.
Achieves high-speed, accurate detection in live feeds.

A Comprehensive Review of Retinal Disease Diagnosis and Open Access Datasets: Fundus and OCT Images

Parneeta Dhaliwal	A Comprehensive Review of Retinal Disease Diagnosis and Open Acess Datasets: Fundus and OCT Images

Surveys retinal disease diagnosis using imaging modalities.
Reviews public datasets for fundus and OCT analysis.
Highlights advances in deep learning-based detection.
Identifies challenges and future research directions.

Ensemble Learning Based Model for Student's Academic Performance Prediction Using Algorithms

Deepti Thakral	Ensemble Learning Based Model for Student's Academic Performance Prediction Using Algorithms

Predicts academic outcomes using ensemble ML methods.
Combines multiple algorithms for better generalization.
Analyzes behavioral and academic performance metrics.
Assists educators in early intervention and guidance.

Integrating Multi-Modal Insights with Transfer Learning for Detecting Metastatic Breast Cancer (MBC-stage IV) Prognostics

Manpreet Kaur	Integrating Multi-Modal Insights with Transfer Learning for Detecting Metastatic Breast Cancer (MBC-stage IV) Prognostics

Uses transfer learning for multi-modal cancer data integration.
Analyzes histopathological and genomic patient data.
Predicts metastatic breast cancer progression and survival.
Enhances precision medicine through AI-driven insights.

Optimization of Erosion Parameters of Coated SS316L using Taguchi Method

Piyush Mahendru,Inder Kumar Bhat	Optimization of erosion parameters of coated SS316L using Taguchi method

Applies the Taguchi optimization approach to minimize erosion wear on SS316L.
Studies the influence of coating thickness, impact angle, and velocity.
Identifies optimal parameter combinations for enhanced surface durability.
Improves corrosion and wear resistance for industrial applications.

Effect of Tool Tip Profile and Tilt Angle on Al8090/TiH2-Al2O3 Foam and its Mechanical Characterization

Smriti Mishra, Jatinder Kumar,Hari Singh	Effect of Tool Tip Profile and Tilt angle on Al8090/TiH2-Al2O3 Foam and its Mechanical Characterization

Investigates how tool geometry and tilt affect foam composite fabrication.
Analyzes Al8090 alloy reinforced with TiH2 and Al2O3 for strength enhancement.
Evaluates mechanical behavior including hardness and compressive strength.
Findings guide tool design for advanced lightweight materials.

Finite Element Analysis of Residual Stresses during Incremental Sheet Forming of Ti-6Al-4V Alloys using Different Tool Path Profiles

Gianender Kajal , M.R.Tyagi, Gulshan kumarl	Finite element analysis of residual stresses during incremental sheet forming of Ti-6Al-4V alloys using different tool path profiles

Uses FEM to simulate residual stress formation in titanium alloys.
Compares different tool path profiles in incremental sheet forming.
Identifies parameters minimizing deformation and stress accumulation.
Improves precision in aerospace-grade Ti-6Al-4V components.

Microstructure and Mechanical Response of SiC and TiO2 Particles Reinforced Friction Stir Welded AA7075 & AA2024

Pradeep Kumar Mouria,Ranganath M. Singari,Reeta Wattal	Microstructure and mechanical response of SiC and TiO2 particles reinforced friction stir welded AA7075 & AA2024

Examines hybrid reinforcement in friction stir welding of dissimilar alloys.
Incorporates SiC and TiO_2 for microstructural strengthening.
Evaluates tensile strength, hardness, and grain refinement.
Demonstrates improved weld performance and integrity.

Impact of Tool Pin Profile on Mechanical & Microstructural Properties of Friction Stir Welded Joints of AA2024 & AZ91D

Pradeep Kumar Mouria,Ranganath M. Singari,Reeta Wattal	Impect of tool pin profile on mechanical & microstructural properties of friction stir welded joints of AA2024 & AZ91D

Studies the influence of pin geometry in joining aluminum and magnesium alloys.
Assesses mechanical properties and microstructural evolution at the weld zone.

Finds that pin profile significantly affects material flow and bonding.
Optimizes weld quality for dissimilar lightweight materials.

Influence of Rotational Tool Speed on Metallurgical Characterization of Friction Stir Welded Joint of AZ91D & AA2024

Pradeep Kumar Mouria,Ranganath M. Singari,Reeta Wattal	Influence of rotational tool speed on metallurgical characterization of friction stir welded joint of AZ91D & AA2024

Analyzes rotational speed's effect on metallurgical properties of dissimilar joints.
Observes grain refinement and intermetallic layer formation.
Higher tool speeds improve mixing but risk thermal degradation.
Provides insight for parameter optimization in FSW processes.

An Experimental Investigation of Gas Tungsten Arc Welding Aspects on Stainless Steel (SS304) using Taguchi Method

Ajit, Gianender Kajal Pratibha Malik,Himanshu Garg, RahulLamba	An experimental investigation of gas tungsten arc welding aspects on stainless steel (SS304) using Taguchi method

Applies Taguchi optimization to GTAW parameters for SS304 steel.
Examines effects of current, gas flow, and electrode angle.
Optimizes tensile strength and bead quality.
Enhances precision welding for stainless steel fabrication.

Investigation of Post-Weld Heat Treatment on Mechanical Properties of Low Frequency Vibration Assisted SMAW Mild Steel Welded Joints

Rajeev Ranjan,Sanjay kumar Jha,Pradeep kumar Mouria,Subhash Mishra	Investigation of post weld heat treatment on Mechanical properties of low frequency vibration assisted SMAW mild steel welded joints

Studies combined effects of vibration and heat treatment on SMAW joints.
Analyzes grain refinement, stress relief, and toughness enhancement.
Shows improved ductility and fatigue resistance after post-weld treatment.
Provides insights for industrial welding process optimization.

Digital Consumer and Legal Compliances in Sustainable Ecosystem: Issues, Challenges and Road Ahead

Prof.(Dr) SK Bose	Digital Consumer and Legal Compliances in Sustainable Ecosystem: Issues, Challenges and Road Ahead
Dr. Aditi Chaudhary	
Dr. Ghazala Abidin	
Dr. Manisha Narula	
Dr. Yamini Atreya	
Ms. Simran Singh	

Examines legal frameworks protecting digital consumers in sustainable ecosystems.

Identifies challenges in e-commerce, data privacy, and regulatory compliance.

Highlights gaps in enforcement and consumer awareness.

Proposes policy measures for a secure and sustainable digital marketplace.

International Human Trafficking in Women and Children for Commercial Sexual Exploitation in the 21st Century

Prof.(Dr) SK Bose	International Human Trafficking in Women and Children for Commercial Sexual Exploitation in the 21st Century

Examines global human trafficking trends targeting women and children.

Discusses legal, social, and policy frameworks for prevention and rehabilitation.

Highlights transnational cooperation challenges.

Suggests strategies for stronger enforcement and victim support mechanisms.

Understanding Jurisdiction with Reference to International Law

Prof.(Dr) SK Bose	Understanding Jurisdiction with Reference to International Law

Explores principles of jurisdiction in international legal frameworks.

Analyzes territorial, personal, and extraterritorial jurisdiction.

Highlights challenges in cross-border legal enforcement.

Provides clarity on resolving disputes in global governance contexts.

Evaluating the Impact of Social Protection Policies on Rural Poverty Alleviation: A Comparative Study in Developing Nations

Prof.(Dr) SK Bose	Evaluating the Impact of Social Protection Policies on Rural Poverty Alleviation: A Comparative Study in Developing Nations

Analyzes effectiveness of social safety nets in rural poverty reduction.
Compares programs across developing countries to identify best practices.
Assesses income support, healthcare, and education interventions.
Recommends policy improvements for sustainable rural development.

Work to Live or Live to Work: A Comprehensive Report on Women and Right to Work

Prof.(Dr) SK Bose	Work to Live or Live to Work: A Comprehensive Report on Women and Right to Work

Explores women's labor rights and workplace equality.

Examines social, economic, and legal barriers to employment.

Highlights the balance between work-life and empowerment.

Provides policy recommendations for equitable workforce participation.

AI, Intellectual Property Rights, and the EU AI Act: Charting a Course for the Future

Prof.(Dr) SK Bose	AI, Intellectual Property Rights, and the EU AI Act: Charting a Course for the Future

Examines AI regulation and its impact on intellectual property.

Analyzes the EU AI Act and implications for innovation.

Highlights challenges in balancing IP protection and AI development.

Proposes legal frameworks for future AI governance.

Human Rights Protection Strategies in India: A Critical Analysis of India's Approach from Legal and Policy Perspectives

Prof.(Dr) SK Bose	Human Rights Protection Strategies in India: A Critical Analysis of India's Approach from Legal and Policy Perspectives

Reviews India's legal and policy mechanisms for human rights protection.

Analyzes successes and gaps in implementation.

Evaluates constitutional provisions and international obligations.

Recommends reforms for strengthening human rights enforcement.

TALKS DELIVEREE BY FACULTIES

Invited Talk on "Recent Technology of AI in Computer Vision", at AECE2023, Noida, India

Invited as Session Chair at International Conference on Advances in computation, communication and information Technology.MRIIRS, Faridabad.

Fractal Patterns and Structures

Resource Person for FDP on Research and Development in Machine Learning/Deep Learning at AKGC, Ghaziabad

AJAY KUMAR GARG
ENGINEERING COLLEGE

United Nations
Academic Impact

CERTIFICATE OF APPRECIATION

This certificate is awarded to

Dr. Mrinal Pandey

Manav Rachna University, Faridabad

for imparting her valuable insights and inspirations as a speaker
in Dr. APJ Abdul Kalam Technical University, Lucknow
Sponsored One Week **Faculty Development Program** on
"Research & Development in Machine Learning/ Deep Learning"
from 5th August to 9th August 2024

Organised by
Department of MCA

Dr. B.K Sharma
HoD MCA & FDP Coordinator

Dr. R. K. Agarwal
Director General, AKGEC

Dr Pooja Kapoor - Session chair for International Conference at School of Management, GD GOENKA UNIVERSITY, Gurgaon