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BYTE STREAM



COMPUTER SCIENCE AND ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY (ISM)
DHANBAD

MONTHLY NEWSLETTER

An Insight into the
Department of Computer
Science and Engineering,
IIT (ISM)

“Computer Science is
no more about
computers than
astronomy is about
telescopes.”

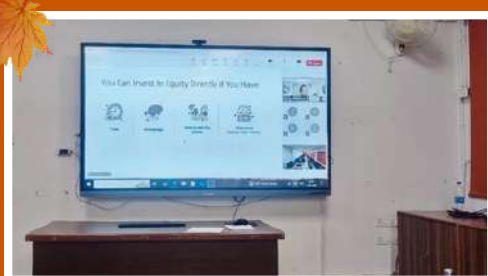
— Edsger W. Dijkstra

Alumni Talk on "Importance of Building Financial Roadmap and Investments" by Raj Kumar Jain

As part of the ongoing Centenary Celebrations, the department organized an insightful Alumni Talk on "The Importance of Building a Financial Roadmap and Investments" on September 3, 2025. The session, held from 6:45 PM to 7:50 PM in hybrid mode, was delivered by our esteemed alumnus, Mr. Raj Kumar Jain of the 2003 batch. The presence of Head of the Department Prof. Chiranjeev Kumar, and Prof. Rajendra Pamula graced the event.

Mr. Jain commenced the talk by introducing the Wealth Cycle Pyramid, emphasizing the foundational importance of wealth protection, especially against the erosive effects of inflation. He provided a practical framework for financial discipline with the 50/30/20 rule, allocating 50% of income to needs, 30% to wants, and a crucial 20% to savings.

The session explored various investment options, focusing mainly on mutual funds. Mr. Jain clarified this concept and passionately supported Systematic Investment Plans (SIPs). He used a strong case study to show the benefits of regular investing with the rupee cost averaging strategy. He also clearly explained the advantages of Top-up SIPs and how a Systematic Withdrawal Plan (SWP) can support future financial stability. He gave useful advice on avoiding common financial mistakes, urging students to ignore social media distractions and to keep their investments separate from their insurance at all times.



A highly interactive Q&A session followed the talk. Students posed thoughtful questions regarding the differences between debt and equity funds, the effectiveness of SIPs against inflation, portfolio allocation for different time horizons, and the taxation rules for mutual funds.

The session concluded with a formal vote of thanks proposed by Mr. Karthik Mohan, CSES Secretary, expressing gratitude to Mr. Jain for sharing his profound knowledge and practical wisdom.

Swachhata Pledge on the occasion of Swachhata Hi Sewa (SHS) campaign



In observance of the directives from the Ministry of Education, Government of India, IIT (ISM) Dhanbad participated in the nationwide Swachhata Hi Sewa (SHS) Campaign, held from September 15th to October 2nd, 2025.

As a key part of this initiative, the Department of Computer Science and Engineering organized a pledge-taking ceremony on September 17th, 2025. The event brought together faculty, staff, and students to formally affirm their commitment to the principles of environmental hygiene and cleanliness.

The pledge centered on the core commitment to volunteer 100 hours annually for cleanliness, to neither litter nor permit it, and to actively promote a clean environment, starting from our own workspaces and localities. The ceremony served as a formal reminder of the importance of individual responsibility in achieving collective environmental goals.

This event successfully demonstrated the department's strong resolve to foster a lasting culture of cleanliness and contribute to a more sustainable and healthy campus environment for the future.



Insights from Microsoft Leaders: A Glimpse into the Future of AI and Engineering

In a thought-provoking session that gave a realistic overview to students about the current job market in the ever-evolving face of AI, the department had the privilege of hosting two distinguished Microsoft leaders - Mr. Sanjib Biswas, Partner Group Engineering Manager for Office AI, and Mr. Ashay Sinha, Senior Product Manager and alumnus of the 2016 B.Tech CSE batch. The event was attended by Head of Department Prof. Chiranjeev Kumar, Prof. Partha Pratim Roy, and CSES Secretary Mr. Karthik Mohan.

Mr. Sinha gave an introduction and overview of the evening, and then Mr. Biswas took over. With over two decades of experience in leading Copilot globally, Mr. Biswas put emphasis on how, even though AI models are proliferating and tools like ChatGPT are somewhat essential, AI cannot completely take over, owing to the fact that AI cannot independently run complex systems like Windows or Linux. His mantra, he says, is: "Jobs won't be run by AI, but by people who know AI."

Students in the session were urged to master the basics - debugging, writing code without autocomplete, and cultivating curiosity as to why and how the code works. Soft skills were highlighted as well, i.e., listening to questions attentively, reading in between the lines, handling time pressure, and clearly articulating logic. This came up as Mr. Biswas remembered how, in one of his interviews, he asked for applications of the Tower of Hanoi problem. Only 30% of people could respond with conceptual insight, while most people answered with the code of the problem. Hence, listening to questions carefully was deeply emphasized.

The session also included a simplistic explanation of the pre-placement offer process: performance during internships, depth of project understanding, and attitude, which matters more than interview theatrics. "Eight weeks of effort outweigh four hours of questioning," Mr. Biswas noted.

To conclude the event, Prof. Chiranjeev Kumar offered a token of appreciation to Mr. Ashay Sinha. Their contributions are not only exemplary in their respective fields but are also inspiring the next generation of engineers.



CELEBRATING EXCELLENCE IN AI: Dr. ACS Rao among top 2% scientists

Prof. Annavarapu Chandra Sekhara Rao is being spotlighted by the CSE Department with great pride, as a position in the prestigious Top 2% Scientists list-curated by Elsevier and Stanford University, has been earned through his groundbreaking work in Artificial Intelligence and Image Processing

A rank of #9324 has been assigned to Prof. A.C.S. Rao in his specialized sub-field, categorized under the broader domain of Information & Communication Technologies. An H-index of 13 and an Hm-index of 7 have been recorded, and this recognition has been attributed to years of impactful research and innovation.

This honour, based on single-year data from 2025, has been regarded as globally significant for IIT (ISM) Dhanbad. It has been viewed as a beacon for aspiring scholars in the field. Not only has individual brilliance been celebrated, but the institute's commitment to excellence in computer science and technology, especially within the evolving landscape of intelligent systems and visual computing has also been reaffirmed. Prof. Rao's achievement stands as a testament to visionary scholarship- igniting curiosity, shaping ambition, and inspiring the next generation of pioneers in Artificial Intelligence.



Prof. Saurabh Srivastava Leads New Institute Project to Advance Automation and Digital Infrastructure

Prof. Saurabh Srivastava of the Department of Computer Science and Engineering, IIT (ISM) Dhanbad, who serves as the Professor-in-Charge of Automation, has been assigned to launch a new three-year, institute-level initiative titled "Continuous Development and Enrichment of Abhikalp." The project aims to strengthen automation and digital management systems across various institutional platforms - including MIS, ARK, and Abhikalp, to ensure smoother, more efficient administrative and academic processes.

The project focuses on enhancing user experience, scalability, and data integration within existing institute portals while introducing new automation modules to support transparent and streamlined workflows. It emphasizes improving backend efficiency and promoting better coordination among academic, administrative, and research divisions through intelligent digital tools.



To support the ambitious scope of this initiative, the project includes the recruitment of skilled personnel, specifically Project Associates and Senior Project Associates. The personnel budget allocation includes ₹46,77,120 for Project Associates and ₹52,61,760 for Senior Project Associates, totaling ₹99,38,880.

By integrating cutting-edge software practices and automation frameworks, this project represents a crucial step toward the institute's vision of a fully digitized and intelligent campus ecosystem. It also reaffirms the commitment to continuous improvement and innovation in its internal systems, ensuring that its digital infrastructure keeps pace with its academic and research excellence.

Strengthening Global Academic Ties Through Strategic International Collaborations

Marking a significant milestone in international academic collaboration, IIT (ISM) Dhanbad has recently signed comprehensive Memoranda of Understanding (MoUs) with two prestigious institutions, the Graduate School of Informatics at Osaka Metropolitan University, Japan and Sookmyung Women's University, Seoul, South Korea.

These landmark agreements were facilitated through the instrumental efforts of Prof. Partha Pratim Roy, CSE Department, IIT (ISM) Dhanbad. It represents a transformative step in the institute's global engagement and underscores its commitment to fostering meaningful cross-cultural academic exchanges. Being a distinguished academic with more than 250 publications, a fellow of IETE and senior member of IEEE, he leveraged his established connections with key faculty members at both institutions. His prior collaborative work and professional relationships with Prof. Masakazu Iwamura from the Graduate School of Informatics at Osaka Metropolitan University and Prof. Byung-Gyu Kim from Sookmyung Women's University provided the foundation for these formal partnerships.



The agreement fosters academic cooperation by enabling both faculty and student exchanges, allowing students to collaborate directly with professors at partner institutions for educational projects and research. It also supports joint academic programs, seminars, and workshops which promote the sharing of resources and creating rich opportunities for enhanced learning.

The MoUs facilitate innovation through exposure to diverse methodologies and advanced resources, helping students build essential

international networks that elevate their academic as well as professional trajectories. By fostering knowledge sharing along with cross-cultural understanding and multidisciplinary teamwork, these partnerships ensure that all participants benefit from innovative research, broader perspectives and enhanced employability in a rapidly evolving technological landscape.

Prof. Soumen Bag's Research Project: AI/ML-Based Cheque Clearing

The project "Design and Development of a Deep Learning Assisted Smart Phone based Application Towards the Automated Cheque Clearing Process in Banking System" is being undertaken by Prof. Soumen Bag, CSE Department, IIT (ISM) Dhanbad with Prof. Prabhat Dansena, Assistant Professor, C.V. Raman Global University, Bhubaneswar as Co-Principal Investigator. The project is being funded by the IIT Bhilai Innovation and Technology Foundation (DST) with a sanctioned amount of ₹27,95,680.



Even as India's banking industry has quickly adopted digital change, cheque clearing is still partially manual. Now, only images of cheques are sent electronically, whereas checks and fraud detection are handled by human operators. This makes processing slower and poses significant difficulties, especially in rural and tribal regions where the availability of banking services is low to begin with and dependence on cheques continues to be high.

The project fills this void by creating a deep learning-powered mobile app that has the capability to automate the whole procedure. By utilizing only a smartphone camera, the app will scan cheque images, compensate for distortions like skew, fold, or shadows, and segment the cheque into important areas. It will then recognize and identify handwritten text, in addition to detecting forged changes like inserted or altered text which are functions that are hard to automate currently. An onboard OCR engine will also verify cheque information for end-to-end processing.

This system promises to provide real-time clearing of cheques with improved security. By minimizing delays, guaranteeing authenticity, and providing a secure solution in distant areas, it can be a prime driver for financial inclusion. In addition to enhanced efficiency, the project will also reduce cheque-related fraud, ushering in a smarter, safer, and swifter solution to India's banking industry.

Workshop on Cyber Security in the Age of Artificial Intelligence

The Department of Computer Science and Engineering was pleased to announce an expert lecture under the Centenary Celebrations on the topic "Cyber Security in the Age of Artificial Intelligence: Defending Tomorrow's Digital World". The session was delivered by Mr. Aabhishek Mitra, Founder and CEO of Indian Cyber Security Solutions (ICSS) and Indian Institute of Cyber Security (IICS), on September 9th, 2025, at 6:30 PM in the Seminar Hall of the Computer Science and Engineering Department.

The session focused on how cybersecurity is changing with the rise of Artificial Intelligence. Mr. Mitra spoke about how attackers are using Artificial Intelligence to launch smarter and more targeted attacks, and at the same time, how defenders are also using AI tools to detect and respond faster. He

explained how traditional security measures are no longer enough, and why AI-driven systems are becoming important in today's digital world. He also discussed real use cases, like how AI is being used in Security Operations Centers (SOCs). He gave an overview of tools that help identify threats before they cause serious damage.

Mr. Mitra is a cybersecurity expert with over a decade of experience in ethical hacking and Artificial Intelligence-based defense. Through his companies ICSS and IICS, he has trained law enforcement teams, worked with companies like Ericsson and Adani, and is known for the ethical counter-hack of Islamabad Airport in 2016. He has conducted workshops across several countries and trained thousands of students and professionals.

The session was highly informative and engaging, offering a clear picture of how AI is transforming the cybersecurity landscape. It gave students and faculty a better understanding of the real-world impact of AI in this domain and the growing need for adaptive skills and strategies. Overall, it was a valuable learning experience for anyone looking to explore the future of digital security.



Teacher's Day Celebration

The Department of Computer Science and Engineering, IIT (ISM) Dhanbad celebrated Teachers' Day with great enthusiasm on the evening of September 4, 2025. The event was organized by the students to express their heartfelt gratitude and appreciation towards the faculty for their constant guidance, support, and inspiration.

The celebration began with the lamp invocation ceremony, symbolizing the light of knowledge and wisdom. This was followed by an inspiring message from the Head of the Department, Prof. Chiranjeev Kumar, which highlighted the department's growth and excellence.



Students presented a vibrant cultural program featuring songs, dances and a humorous skit highlighting the vital role teachers play in shaping students' academic and personal journeys. The evening was further enlivened by fun games and interactive sessions with teachers, which brought smiles and laughter to both students and faculty.

The event was concluded with a vote of thanks and the presentation of tokens of appreciation to the faculty members. The celebration beautifully captured the spirit of gratitude, respect, togetherness which made it a memorable evening for everyone.

Research Project on Secure Medical Image Transmission to Prof. Partha Pratim Roy

A research project titled "Design and Implementation of High-Capacity Reversible Data Hiding Schemes for Medical Image Transmission" has been sanctioned under the Teachers Association for Research Excellence (TARE) scheme by the Anusandhan National Research Foundation (ANRF), Government of India to Prof. Partha Pratim Roy, Department of Computer Science and Engineering, IIT (ISM) Dhanbad. The project, with a total outlay of Rs. 18,30,000, is being carried out over a period of three years (01-Nov-2022 to 31-Oct-2025).

The project aims to develop advanced techniques for secure and efficient medical image transmission using Reversible Data Hiding (RDH). RDH is an emerging research area that focuses on embedding additional data within a cover medium in such a way that both the embedded data and the original content can be completely recovered later. In the context of healthcare, this technology enables patient information and medical reports to be securely embedded within medical images themselves, ensuring that only a single file needs to be transmitted instead of separate image and report files.



Existing RDH techniques, however, face limitations in terms of embedding capacity, which restricts their use in real-time medical applications. This project seeks to design new RDH schemes capable of achieving higher embedding capacity without compromising the accuracy of data extraction or the quality of image restoration. The outcomes of this research are expected to contribute significantly to the field of secure medical data management, paving the way for safer, faster, and more efficient healthcare communication systems.

R&D Projects approved in the month of September 2025

TITLE	FACULTY	AMOUNT	FUNDING ORGANIZATION
Neural Decoding of Visual Stimuli Using EEG and Computer Vision	Prof. Partha Pratim Roy	INR 20,00,000	FRS, IIT (ISM) Dhanbad
Special Grant to Establish Advanced Lab for UG/PG, IIT (ISM) Dhanbad	Prof. Partha Pratim Roy	INR 30,00,000	IIT (ISM) Dhanbad

Recently accepted research work for publication

Title: Deep feature extraction and swarm-optimized enhanced extreme learning machine for motor imagery recognition in stroke patients

Authors: Vaishali R. Shirodkar, Damodar Reddy Edla, Annu Kumari, and Ramesh Dharavath

Accepted at: Journal of Neuroscience Methods, Volume 424, 2025, 110565

Title: Machine Learning for Roof Convergence Safety in Underground Coal Mines: A Conceptual Framework

Authors: Srikanth Banda, Ramesh Dharavath

Accepted at: Journal of Mining, Metallurgy & Exploration, Springer

Research Scholars joined in the month of September 2025

Scholar	Supervisor
Arijit Barat	Prof. Ayan Das
Arunish Attri	Prof. Nikhil Tripathi
Dhiraj Sharma	Prof. Saurabh Srivastava



Ph.D. Thesis Submitted

Name of Scholar	Supervisor(s)	Thesis Title
Tapan Kumar Nayak	Prof. A.C.S Rao	ANALYSIS, CLASSIFICATION AND INTERPRETATION OF MEDICAL IMAGING DATA USING DEEP LEARNING TECHNIQUES

Fueling Innovation: Inside CSAI's Research-a-thon 1.0

CSAI, the official Machine Learning and Artificial Intelligence division under the Computer Science and Engineering Society (CSES), recently launched its flagship event, Research-a-thon 1.0 - an intensive competition designed to bridge the gap between classroom learning and real-world research. The problem statement walkthrough, conducted by CSAI Coordinator - Rudraksh Sachin Joshi and his team, was held on 26th September in the Department, setting the stage for participants to dive into diverse domains such as Agentic AI, Computer Vision, and Federated Learning.



The event officially commenced on 28th September, 2025 with the start of the 15-day Build Phase, where students are tasked with researching, prototyping, and drafting formal research papers in IEEE ICASSP format. To ensure participants stay on track and refine their ideas, regular mentoring sessions are being conducted throughout the competition, offering continuous guidance, constructive feedback, and technical support from experienced mentors. This mentorship-driven approach encourages participants to think beyond conventional boundaries and come up with solutions that are both innovative and impactful.

With evaluation criteria emphasizing research novelty, technical implementation, paper quality, and presentation skills, Research-a-thon 1.0 promises to be a holistic and enriching experience. Beyond exciting prizes and recognition, the event also provides a direct pathway for outstanding participants to join the CSAI team, offering them a platform to showcase their expertise and creativity.

The journey continues with interviews scheduled for 13th October, followed by the eagerly awaited results announcement in mid-October. More than just a competition, Research-a-thon 1.0 embodies the spirit of exploration and discovery, fostering a culture of research-driven innovation within the CSE community and inspiring young minds to contribute meaningfully to the ever-evolving landscape of technology.

Contact Us:

Prof Chiranjeev Kumar
 Head of the Department
 Email: cse@iitism.ac.in
 Phone: +91-326-2235273 (O)

Credits:

Prof Nikhil Tripathi (Faculty Coordinator)
 Shyam Sunder (22JE0945)
 Apurva Arya (24JE0593)
 Kasam Pramodha (23JE0463)

Share your ideas, stories, or articles by mailing us at bufferedReader@iitism.ac.in

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