JUNE 2026

# 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)

> "Our intelligence is what makes us human, and AI is an extension of that quality."
>
> — Yann LeCun

## Confluence 2026

Confluence, known as an Alumni Interaction Meet, united the extended departmental community this year on June 13th, 2026, at the Zephyr Club House in Bengaluru. The event aimed to strengthen and continue the relationship between the alumni and the Department of CSE, IIT (ISM), Dhanbad. Attendees were welcomed by the Head of the Department, Prof. Chiranjeev Kumar, and the Faculty-In-Charge of the CSES, Prof. Dharavath Ramesh. It was anchored by Ms. Sucheta Ghosal and managed by the student organizing team.


The proceedings opened with a screening of the Institute Video, followed by insightful reflections from the IIT (ISM) Alumni Association Bengaluru chapter members, who shared memories of the institution's evolution. Prof. Dharavath Ramesh highlighted the department's recent growth, including faculty expansion and the launch of new Special Interest Groups (SIGs).
Mr. Aravind Dwibhashyam detailed the organizational divisions of CSES and shared pivotal information regarding the upcoming RAIT 2027 conference. Mr. Pratham Aggarwal demonstrated the features and development of WebCSE. Mr. Alok Raj and Mr. Rudraksh Sachin Joshi presented the core ideas, long-term vision, and technical aims behind the Computer Science and Artificial Intelligence (CSAI) initiative. Mr. Vedaansh Lakhani introduced the Student Alumni Relationship Cell (SARC), which serves as a vital bridge for networking opportunities.

Prof. Chiranjeev Kumar then offered a comprehensive overview of the milestones being achieved by the department and the society since 2005. The evening concluded with a batch-wise group photo session and a shared commitment to the future, with all looking forward to "Confluence 2027."

## AI and Data Science for Smart Healthcare

The AICTE-sponsored 24-week QIP-PG Certificate Programme on AI and Data Science for Smart Healthcare aims to provide the foundational knowledge and practical skills needed to apply AI and Data Science in the healthcare sector. Coordinated by Prof. Haider Banka, IIT(ISM) Dhanbad, the six-month programme is scheduled from 1 August to 15 December 2026 with 200 hours, excluding evaluation through both online and offline sessions. The programme stems from the growing demand for AI-driven solutions in healthcare to improve patient care, enhance operational efficiency, and address healthcare inequities.

This course begins with Fundamentals of Computing and Problem Solving (CS Core 1), covering algorithms, C/Python Programming, Data Structures, Data manipulation, and Data visualization. It includes Fundamentals of Machine Learning and Data Science (Domain core) which introduces Foundations of AI and Healthcare Data, Machine Learning for Healthcare, Deep Learning in Medical Imaging, Natural Language Processing in Healthcare, Time Series analysis for Healthcare, and Explainable AI and Interpretability. The Programme also covers Fundamentals of Deep learning and NLP (CS Core 2), explaining the data science methodologies, Exploratory Data Analysis (EDA), Fundamentals of Genetic Algorithms and Artificial Neural Networks. The specialized domain on Applications of AI/ML in Healthcare and related applications focuses on Big Data and Cloud Computing in Healthcare.

The curriculum emphasizes practical learning through projects such as an AI-Powered Medical Chatbot, Disease Prediction System, AI-Assisted Medical Imaging Analysis, Smart Health Monitoring System, AI-Based Drug Discovery and Development, Personalized Healthcare Recommendation System, AI-Powered Electronic Health Records (EHR) System, AI-Driven Mental Health Assessment, Automated Medical Report Generation, AI-Powered ICU Patient Monitoring System.

This course will prepare students to drive innovation and improve patient outcomes in the healthcare sector. By applying AI in real-world healthcare scenarios, learners will develop the ability to tackle practical healthcare problems and stay informed on emerging AI trends.

## Celebrating 25 Years of Excellence: Prof. P. K. Jana's Retirement


On 30th June 2026, Prof. P. K. Jana retired as Professor (HAG) from IIT(ISM) Dhanbad, marking the culmination of 25 years of dedicated service to the institute. He joined IIT(ISM) in 2000, soon after completing his Ph.D. in Computer Engineering from Jadavpur University (jointly supervised with ISI Kolkata), and since then has contributed immensely to teaching, research, and academic administration.

Over the course of his career, Prof. Jana has made remarkable contributions to academia. He co-authored six books, including two with CRC Press, along with four book chapters and three edited volumes. His prolific research output includes 219 publications – 94 journal articles and 125 conference papers – which have collectively received 9,366 citations on Google Scholar. His mentorship has been equally impactful, having supervised 22 Ph.D. scholars and 59 M.Tech dissertations, nurturing generations of researchers. He successfully completed three R&D projects and one FIST (DST) project, delivering significant research and technological outcomes. Additionally, he conducted seven short-term courses, sharing his expertise with students, faculty, and professionals.

CSES and the Department of Computer Science & Engineering extend their heartfelt best wishes to Prof. P. K. Jana for a fulfilling retired life, with hopes that he stays safe and remains connected with the department.

Prof. Jana's excellence has been recognized through numerous awards. He received the Canara Bank Research Publication Awards (2015 & 2017), was listed among the Top 2% Indian Scientists in Artificial Intelligence in the Stanford University survey (2020–2025), and was honored with the Academic Excellence Award 2025 by the University of Engineering and Management, Kolkata. His research papers have earned Best Paper Awards at prestigious international conferences, including ICDCIT 2025, ICDCIT 2023, ICACCI-2018, CEECE-2017, and ICECCS-2013.

Beyond publications and awards, Prof. Jana has delivered 55 invited talks and keynote speeches, and served as Advisory Committee Member, Chair, or Guest of Honour in 15 international conferences. He continues to contribute to the global academic community as Associate Editor of the International Journal of Communication Systems (Wiley).

His research interests span Cloud Computing, Fog Computing, Internet of Things, Machine Learning, Wireless Sensor Networks, and Parallel & Distributed Computing. In administration, he has served as Chairman of the Department Faculty Screening Committee, Convener of the Department Post Graduate Committee, and twice as Head of the Department, strengthening the institute through his leadership.

Prof. Jana's vision, scholarship, and mentorship have left an indelible mark on IIT(ISM) Dhanbad. His retirement closes a distinguished chapter, but his legacy of academic excellence and inspiration will continue to guide students and colleagues for years to come.

## IIT (ISM) Dhanbad Enters QS World University Rankings

Some moments don't just add a line to an institution's history - they redefine how the world sees it. For the Indian Institute of Technology (Indian School of Mines), Dhanbad, that moment has arrived: the Institute has, for the first time in its 100-year history, entered the QS World University Rankings 2027, securing a place in the 701–710 global band. Among Indian institutions featured, it stood 21st out of 52, and 11th among the 13 IITs ranked.

Director Prof. Sukumar Mishra described it as a "historic milestone" reflecting the Institute's growing academic and research stature. The numbers back the claim: a strong Citations per Faculty score of 87.3, an International Research Network score of 43.2, and a Sustainability score of 57.5 - alongside an earlier 110th rank in QS Southern Asia 2026.

But if the overall debut is historic, the subject rankings confirm something the mining world has long known. In the QS World University Rankings by Subject 2026, IIT (ISM) was ranked 21st globally and 1st in India in Mineral & Mining Engineering — from 20th the previous year and 41st the year before that. The Institute also featured in Petroleum Engineering (151–175 globally) and Mechanical Engineering (501–575 globally), proof that its strength now reaches well beyond its founding discipline. For an institute born in 1926 to train manpower for India's mining sector, this is validation that its founding vision has only sharpened with time.

Director Prof. Sukumar Mishra's words capture the moment best: "I believe profoundly in the strength and promise of IIT (ISM) Dhanbad... let this methodical and comprehensive way of thinking serve as a guide and inspiration for our endeavours."
With initiatives like TEXMiN's new MoU with UiT, The Arctic University of Norway, widening its global research footprint, this ranking isn't a finish line - it's a launchpad. For every student and alumnus who has called this Institute home: this is what we built, and this is only the beginning.



## Announcing RAIT 2027

The Department of Computer Science at IIT (ISM) Dhanbad is thrilled to announce the 7th International Conference on Recent Advances in Information Technology (RAIT 2027). Scheduled for March 12–13, 2027, this premier event will convene researchers and industry professionals to explore breakthrough advancements across AI, data systems, signal processing, and applied IT frontiers. A significant draw for this year's conference is the robust publication opportunity. All accepted and presented papers will be officially published in IEEE Xplore. Furthermore, selected top-tier papers will receive an invitation for publication in Springer SN Computer Science (a prestigious Q2 journal). Submissions are currently encouraged for papers across four major tracks:

- AI, Information Systems & Robotic Process Automation
- Signal and Image Processing & Computer Vision
- Big Data Analytics, Cloud Computing & Cybersecurity

IoT in Industry, Advanced Computing & Intelligent Networks

Prof. Partha Pratim Roy, Prof. Soumen Bag, and Prof. Pranay Kumar Saha will serve as the General Chairs of the conference committee while Prof. A.C.S. Rao and Prof. Anjan Chowdhury are the Organizing Chairs.

Submission and Conference Timeline:

- Paper Submission Deadline: October 2, 2026
- Notification of Acceptance: November 30, 2026
- Camera-Ready Deadline: December 15, 2026
- Conference Dates: March 12–13, 2027

Researchers are encouraged to submit their papers at RAIT 2027. Submissions are now open. The conferences invites innovative contributions, exchange of ideas and welcomes sponsorships. Visit the site for more details: https://people.iitism.ac.in/~rait

## New R&D Projects

### DARSI: Demand-Aware Rooftop Solar Mapping and Installation Optimization with Limited Satellite Data and Model Debiasing

Rooftop solar is scaling rapidly in India, but "where" and "how much" to install still often depends on coarse surveys or expensive, high-resolution satellite imagery—leading to suboptimal panel placement, avoidable shading losses, and a gap between installed capacity and real energy output. DARSI (Demand-Aware Rooftop Solar Mapping and Installation) is a newly accepted project that tackles this problem end-to-end by combining satellite-image intelligence with electricity-demand awareness, while explicitly addressing the realities of limited/low-quality imagery and geographic model bias. The project's Principal Investigators are Dr. Pranay Kumar Saha, IIT (ISM) Dhanbad, and Dr. Pratik Mazumder, IIT Jodhpur. The total sanctioned amount is ₹95,03,040, with ₹41,51,520 for IIT (ISM) Dhanbad and ₹53,51,520 for IIT Jodhpur.

At the core of DARSI is a pipeline that starts with data-efficient rooftop and obstruction segmentation. Instead of assuming abundant, clean imagery, the project develops segmentation methods designed to remain reliable under low-resolution or scarce data, and it incorporates debiasing and domain adaptation so models pretrained on other regions generalize to diverse Indian urban and rural rooftop patterns. Next, DARSI estimates solar potential using a robust, multimodal approach that leverages segmentation outputs plus physical parameters, aiming to reduce the brittleness of rule-based methods and improve performance even when image quality is poor.

The final step is where DARSI becomes "demand-aware": it formulates a robust optimization model that jointly considers uncertainty in both electricity demand and solar generation, producing placement and sizing decisions that remain cost-effective under worst-case conditions (a two-stage min-max design). Importantly, the project delivers more than research prototypes: it plans an integrated DARSI Planner tool with visualization (rooftop maps, heatmaps, demand profiles, and optimized layouts) and pilot deployments across representative urban and rural sites–targeting real stakeholder use, from policymakers to installers.

### SANCHARI: An Efficient Generic Software Tool for the Synthesis and Validation of Cost-Effective Time-Sensitive Networks

The research project titled "SANCHARI: An Efficient Generic Software Tool for the Synthesis and Validation of Cost–Effective Time–Sensitive Networks" has been accepted under the ANRF–Advanced Research Grant (ARG) Scheme. The project is led by Dr. Jaishree Mayank, Department of Computer Science and Engineering, IIT (ISM) Dhanbad, in collaboration with Dr. Arnab Sarkar of IIT Kharagpur and Dr. Arijit Mondal of IIT Patna. The project has received a total sanctioned budget of ₹1.5914 crore, with ₹78.4 lakhs allocated to IIT (ISM) Dhanbad.

Modern cyber-physical systems require communication networks with deterministic behavior, high bandwidth, and strong reliability. Time-Sensitive Networking (TSN) enables low-latency, fault-tolerant communication over Ethernet, making it suitable for real-time and mission-critical applications. However, TSN design remains challenging due to manual and fragmented methodologies, limiting large-scale adoption. The SANCHARI project addresses this challenge by developing a unified software platform for TSN synthesis and validation, enabling automated topology generation, scheduling, routing, and adaptive reconfiguration.The project supports initiatives such as Make in India and Atmanirbhar Bharat by promoting cost-effective TSN adoption, strengthening smart infrastructure, and advancing research in time-sensitive networking.

## Publications

**Title: Extracranial vascular association of moyamoya disease: a systematic review and machine learning analysis**

**Authors:** Mondal, Ritwick, Shramana Deb, Nirmalya Ray, Ananya Sengupta, Purbita Sen, Debarati Barma, Jayanta Roy, Anjan Chowdhury, and Julián Benito-León

**Accepted in:** Neurological Sciences 47, no. 7 (2026): 560, doi:10.1007/s10072-026-09168-0, 2026

**Title: Reliability-Constrained Dual-Path Scheduling of CAN-Ethernet Traffic in TSN Architectures**

**Authors**: Swathiga Vaishnave D, Jaishree Mayank, Sivaselvan B

**Accepted at**: IEEE 103rd Vehicular Technology Conference: VTC2026–Spring

**Title: Cost Aware Sector Symmetry and Wafer Cutting Methods for 3D ICs with Heterogeneous Defects**

**Authors**: Tanusree Kaibartta, Saksham Jha, Digvijay Anand and Debesh K Das.

**Accepted at**: ITC 2026

**Title: Clustering Guided Dense Context Sensitive Structure Extractor: A Relaxation Induced Approach**

**Authors**: Ajaharul Hoque; Subhrangsu Mandal; Debaditya Barman; Paramartha Dutta

**Accepted in**: Information Sciences, Elsevier

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