

OCTOBER 2025

# 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)



It's hardware that makes  
a machine fast. It's  
software that makes a  
fast machine slow."

— Craig Bruce

## Guest Talk: “Road to ICPC” with Mr. Yash Daga

As part of its continuous efforts to inspire and guide budding programmers, CodeISM, under the CSE Society of IIT (ISM) Dhanbad, organized an insightful guest talk titled “Road to ICPC.” The session featured Mr. Yash Daga, a distinguished alumnus of the CSE batch of 2023, who is currently a Software Engineer at Rubrik, and an ex-Googler. A Grandmaster on Codeforces (2400+ rating) and an ICPC World Finalist, Mr. Daga brought with him a wealth of experience in competitive programming and real-world problem-solving.

During the session, Mr. Daga shared his personal journey through the competitive programming landscape - from his early struggles and learning strategies to representing IIT (ISM) at the ICPC World Finals. He offered an in-depth roadmap for ICPC preparation, covering essential topics, effective problem-solving approaches, and resource recommendations.

He also highlighted common pitfalls that many aspirants face, such as poor time management, lack of consistency, and inefficient team dynamics, and recommended best practices to overcome them. He emphasized on building strong fundamentals, practicing regularly on platforms like Codeforces and CodeChef, and maintaining a balanced mindset during contests.

The session concluded with an engaging Question-and-Answer, where students interacted with Mr. Daga about coding strategies, career paths in software engineering, and balancing academics with competitive programming.

The “Road to ICPC” talk was both motivational and practical, leaving attendees inspired to push their limits and aim for excellence. CodeISM’s initiative once again reinforced its commitment to nurturing a strong coding culture within the CSE community.



## Hackology 2025: A Deep Dive into Digital Defense



As part of the Centenary Celebration, the Department of Computer Science and Engineering organized a technical talk titled “Hackology 2025: From Phishing to IoT Exploits” on 8th October 2025 (Wednesday) at 6:30 PM in the CSE Department. The session featured Mr. Hrithik Lall, Cybersecurity Lead at Softcell Global Technologies, a renowned expert in offensive and defensive security practices.

Mr. Lall delivered an engaging and insightful session that explored the evolving landscape of cyber threats- from traditional phishing techniques to advanced exploits targeting Internet of Things (IoT) devices. He illustrated how the convergence of connected systems has expanded the attack surface, making security-by-design principles and proactive defense strategies more critical than ever.

Through live demonstrations and real-world case studies, the speaker highlighted emerging trends such as AI-driven social engineering, IoT botnets, and zero-day vulnerabilities. The session also emphasized the role of ethical hacking and responsible disclosure in strengthening digital resilience.

The talk attracted enthusiastic participation from students, researchers, and faculty members, fostering meaningful discussions on the future of cybersecurity and inspiring the next generation of ethical hackers and security professionals.

## How to Not Ace Your Career - An Intriguing Talk by Mr. Spandan Kundu

On 17th October 2025, the Department of Computer Science and Engineering hosted a memorable alumni speaker session titled “How to Not Ace Your Career”, delivered by Mr. Spandan Kundu, CSE alumnus of the 2025 batch and presently an SDM at Aeroqube. The title itself set the tone: this was not a conventional roadmap to success, but a refreshing exploration of the value of detours, defiance, curiosity, and self-belief.

Instead of offering a standard formula for career planning, Mr. Kundu spoke about the importance of questioning norms and learning through lived experience. He reflected on the early pressures of choosing a “perfect” career path and instead emphasized how giving oneself permission to explore can lead to greater clarity and fulfillment. With warmth and candour, he shared moments from his student life at IIT (ISM) Dhanbad, explaining how stepping outside rigid expectations allowed him to discover passions, build confidence, and eventually find a role aligned with his interests.



A heartfelt portion of his talk was dedicated to the role played by the CSE Society (CSES) in shaping his journey. Calling it his “science lab”, he described it as a space where ideas were nurtured, collaboration was natural, and creativity thrived. It was, as he put it, not just a society but a family that helped him grow personally and professionally, all while maintaining academic excellence, reflected in his CGPA of 9.46.

The session also brought practical wisdom for students preparing for placements. Through a clever real-time puzzle challenge, he demonstrated how panic, assumption, and over-analysis often do more harm than good. True preparation, he suggested, lies in staying calm, thinking clearly, and understanding context rather than chasing intensity or perfection. He urged students to commit to their routines, avoid distractions masquerading as “stress relief,” and trust in consistent effort over rushed last-minute sprints.

In closing, Mr. Kundu reminded the audience that success rarely unfolds in a perfectly straight line. Detours do not derail careers, they often define them. His talk resonated deeply with students, not as a checklist to follow, but as reassurance that discovering one's own pace, process, and purpose is not a weakness, but a strength.

The department extends its sincere appreciation to Mr. Spandan Kundu for returning to his alma mater with such openness and sincerity. His reflections served as a timely reminder that the best journeys are not always linear and that sometimes, not “acing” everything is exactly how you build a career worth having.

## Essay Competition: “WriteToWin” by CSETimes

To celebrate the fusion of creative writing and computational thought, CSETimes organized “WriteToWin”- an essay competition themed around the Internet. Held on 30th October at 7 PM in the CSE Department, the event welcomed participants from all years of B.Tech, alongside M.Tech and PhD scholars, fostering a vibrant mix of perspectives.

Topics were revealed on the spot, challenging participants to write 500-750 words within 90 minutes on either: “If I could redesign one aspect of the



internet” or “What if your search history was your autobiography?”. With pens racing and minds ignited, participants showcased originality, wit, and depth- making the judging process delightfully difficult. The first prize was awarded to Sushanth Shridhar Sharma (Double Major, 2027), followed by Devarsh Nayyar (B.Tech, 2029) and Rishap Yadav (B.Tech, 2029). Special mentions were given to Prabidush Kr Lal (B.Tech, 2027) and Debanjali Bagchi (B.Tech, 2028) for their compelling narratives.

CSETimes congratulates all participants for their thoughtful contributions and spirited engagement. The success of “WriteToWin” reflects the community's enthusiasm, and CSETimes looks forward to curating more such intellectually enriching events.

## Research-a-thon 1.0

The CSAI Division of the CSE Department organized the Research-a-thon 1.0, which turned out to be a great success. It ran through a structured three-phase process. Participants were given a curated set of problem statements to work on, providing direction while still leaving room for original thinking and experimentation. Submissions opened on October 12 and the teams had roughly 24 hours to get their papers in.

After that, the mentors took over. On October 13th and 14th, they ran a double blind peer review, scoring papers on originality, methodology and clarity. The mentors also gave feedback for improvement. Each mentor independently evaluated the work, so everyone got fair treatment regardless of who submitted what.



The live presentations happened on October 14. Each participant got a 30 minute slot, 15 minutes to present the research and then 15 minutes of Q&A with the judges and mentors. Students were evaluated on three key things, how well they reasoned through their work, the quality of their experimental results and whether they could explain it all concisely. The presentations went fairly well. The mentors' reviews were solid. Students managed to draft realistic experiments based on their hypotheses and draw actual conclusions from what they found.

Suryansh Kulshreshtha, B.Tech 2028, stood 1<sup>st</sup> in the competition whereas Sriyukthika Srighakollapu, B.Tech 2027, took away the 2<sup>nd</sup> spot. On 3<sup>rd</sup> position was Raj Priyadarshi , B.Tech 2028.

The session was interactive and engaging, with mentors sharing valuable insights and constructive feedback. They discussed potential improvements through related research papers, experiments, and ablation studies, showing good promise for future research directions.



## Codesesey 2.0: A battle of Logic and Code

The Department of Computer Science and Engineering, IIT (ISM) Dhanbad, witnessed an electrifying display of programming prowess in the form of Codesesey 2.0, a flagship competitive programming event organized by CodeISM under the CSE Society. The event saw a great deal of enthusiasm from students across all years and programs, divided into three divisions:

Division A: for 3rd & 4th-year B.Tech, Double Major, Dual Degree, M.Tech, and Ph.D. students

Division B: for 2nd-year CSE students

Division C: for 1st-year CSE students.

The following candidates emerged victorious from each division with their exceptional performance and problem solving brilliance.

Div A - Obbareddy Leela Sai, Mohd. Ashaz Khan

Div B - Sreenandan Shashidharan, Animesh Roy, Anurag Dwivedi

Div C - Agam Patel, Shivam Thakur, Sujal Raj



The fierce coding contest spanned two intense days and began with an ICPC-style preliminary round, where participants battled through algorithmic challenges of varying difficulty. The top 16 performers from each division advanced to the 1v1 lockout rounds held on the following day.

Day two brought thrilling and nerve-racking showdowns, structured over four elimination rounds from- 16 to 8, 8 to 4, 4 to 2, and finally, to the champion of each division. With each problem carrying points based on difficulty, competitors demonstrated not only their coding skills but also strategic problem selection and time management.

## Research Collaboration of Rudraksh Sachin Joshi at ICCV 2025

We are proud to announce that Rudraksh Sachin Joshi, an undergraduate researcher (B.Tech, Class of 2026) from the Indian Institute of Technology (ISM) Dhanbad, has had his work accepted at the ICCV 2025 Knowledge-Intensive Multimodal Reasoning (KnowledgeMR) Workshop. The paper, titled "Segment Anything to Explain Anything: Concept-Level Attribution with Foundation Models under Limited Supervision," was carried out in collaboration with Ayush Somani and Prof. Dilip K. Prasad from UiT – The Arctic University of Norway. The paper was presented in the US (Hawaii) on 19th October 2025.

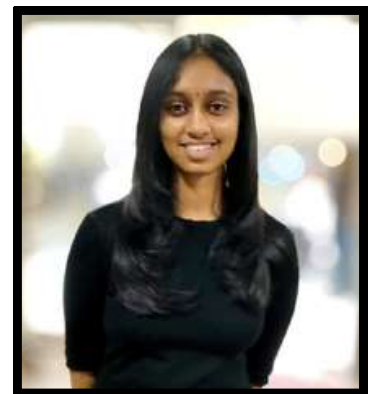
The work introduced Segment-Concept Explanations (SCE), a new post-hoc explainability framework that blends vision-language models with segmentation to deliver semantically grounded, human-aligned insights for visual AI systems. Rudraksh played a key role by integrating lightweight vision-language models, improving semantic grounding and efficiency. This enabled SCE to group coherent concept regions even in zero-shot settings. Tested across datasets like CUB-200, Oxford Pets, and Kvasir-SEG, SCE outperformed existing methods in faithfulness and localization, showing strong potential for medical anomaly detection and other safety-critical applications.



This achievement showcases not only cutting-edge research in explainable and multimodal AI, but also the spirit of innovation and collaboration across institutions. Congratulations to Rudraksh Sachin Joshi, Ayush Somani, and Prof. Dilip K. Prasad for representing UiT Norway and their research community on the global stage at ICCV 2025.

## INTERNSHIP EXPERIENCES

At Aeroqube, I joined as a Software Engineering Intern, where over the course of seven months, I had the opportunity to contribute to two innovative products across different domains. My first project involved the News Reader Avatar, where I developed voice cloning and text-to-speech systems to narrate news in the style of a reporter across nine Indic languages. The challenge of accurately capturing distinct linguistic nuances and speech patterns was both demanding and rewarding. In my second project, I worked on building an end-to-end agentic email system for Buildmapper.ai, gaining valuable experience in full-stack development and product integration. Weekly meetings with colleagues helped me exchange ideas, learn, and receive valuable feedback. The most cherished moment was presenting the developed product in the presence of the entire team. I enjoyed it a lot. Overall, I had a really rewarding experience. Aeroqube's supportive environment and emphasis on innovation enhanced my technical and collaborative skills, helping me grow both as a developer and as a problem-solver.



Srigyakollapu Sriyukthika (B.Tech, 2027 Batch)



Nidhi Mithiya (B.Tech, 2028 Batch)

During a 2.5-month internship at Aeroqube Inc., an AI-powered software solutions startup, I contributed to the Daily Digest Agent for BuildMapper.ai. My responsibilities included extracting critical information, such as upcoming meetings, high-priority leads, and unreplied emails, from a large Odoo database. I also participated in frontend development, application deployment, and gained practical experience with version control, staging and production environments, API keys, and SQL, all while collaborating closely with the team. The organizational culture fostered an open and supportive environment, characterized by regular sync-ups, immediate feedback, and a flat hierarchy, which facilitated learning and inquiry from senior colleagues. This experience significantly enhanced my technical and problem-solving abilities, in addition to cultivating my confidence, collaborative spirit, and adaptability as a team member.

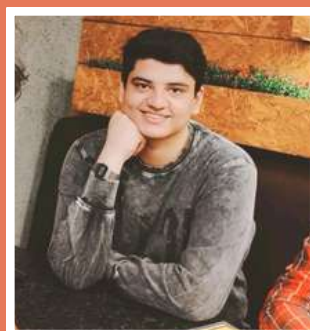
## Amazon ML Challenge Finalists - Mr. Rudraksh Joshi and Mr. Alok Raj

Mr. Rudraksh Sachin Joshi and Mr. Alok Raj from the Department of CSE of batch 2026 have achieved a standout performance in the Amazon ML Challenge 2025, securing the 6th overall national rank. Their team SPAM\_LLMs, was comprising of interdisciplinary members Mr. Manav Jain (ECE) and Mr. Prasanth Karaka Naidu (EE) who together achieved this accomplishment. This 72-hour nonstop hackathon is one of India's most demanding AI competitions, drawing a massive field of over 5,000 teams.

This year's problem statement was exceptionally difficult, pushing participants far beyond standard modeling. The task was to predict an item's price using only its natural language description and product images, with no structured tabular data. This required a sophisticated, multi-modal fusion of Natural Language Processing (NLP) and Computer Vision (CV).

To tackle this, the team engineered an advanced architecture. Their solution used separate neural "towers" to process the text and image data independently, generating deep embeddings for each. These embeddings were then intelligently fused in a unified latent space and fed into a final regression model.

A critical part of their success was a log-normalized target regression pipeline. This, combined with extensive data analysis and preprocessing, allowed them to effectively handle the high skew and variance common in real-world e-commerce data. Their approach also included novel concepts like semantic fusion and KNN correction, setting their work apart from standard baselines.



From left to right Rudraksh Sachin Joshi & Alok Raj

For the finalists, this top-tier finish opens significant professional doors. Their achievement has directly led to high-value career opportunities, including pathways to potential placements and research collaborations as Applied Scientists with Amazon's core machine learning teams. This success from the team was part of a larger, outstanding performance by the institute. In total, five teams from IIT (ISM) Dhanbad ranked in the top 25 nationally, highlighting the institute's growing strength in the AI research landscape.

Team_id	Team Name	Organisation	Final Ranking
40274953	Messl	Indian Institute of Technology (IIT), Madras	1
39555019	Zenith	Indian Institute of Engineering Science and Technology (IEST), Shibpur	2
40235522	00_Team_Rocket	Indraprastha Institute of Information Technology (IIIT), Delhi	3
39508785	royal_recruits	Indraprastha Institute of Information Technology (IIIT), Delhi	4
39516916	Test Data	Indian Institute of Technology (IIT), Patna	5
39516986	SPAM_LLMs	Indian Institute of Technology, Indian School of Mines (IIT ISM), Dhanbad	6
39790895	Aatrix	Thapar Institute of Engineering and Technology (TIET), Patiala	7

## Performance of CSE Students in Concetto - 2025

The students of the CSE Department delivered an outstanding performance at Concetto 2025, securing top positions across events. The team MathFreaks, comprising B.Tech 2028 students Aravind Dwibhashyam, Shubhomoy Dey, and Sreenandan Shashidharan, secured 1st place in Mathalon, conducted by the Mathematics and Computing Department. Following closely, Kuch Bhi - represented by another team of B.Tech 2028 students Neelamber Mishra, Rahul Joshi, and Yash Agarwal achieved 2nd place in the same event, while Good Ppl, consisting of B.Tech 2029 students Vaddanapu Sri Karthik, Ravada Venkata Varaha Satya Sai Yuva Ganesh, and Mannava Hem Charan Sai, earned the 3rd place. Additionally, Begari Jyothika, B.Tech 2029, brought pride to the department by securing 2nd place in Kryptoes. These accomplishments highlight the exemplary talent, analytical skill, and competitive spirit of our students.



## PhD Theses submitted in the month of October 2025

Awardee	Supervisor	Thesis Title
Sreenu Naik Bhukya	Prof. A.C.S Rao	Energy Efficient Clustering Algorithms using Metaheuristic Approaches for WSNs and IoTs

## Recently accepted Research Work for publication

**Title: *Weighted Color-Morphology Feature Fusion for Tuberculosis Bacilli Detection from Cytopathology Images***

Authors: P. Kapoor, Y. Bansal, D. Myra, S. Jacob, V. K. Iyer, L. Singh, A. Khan, P. P. Roy

Accepted at: Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), 2025.

**Title: *Optimal real-time inter-zone message communication via ethernet backbone in software defined vehicles***

Authors: R. M. C. Kota, A. R. Molla, J. Mayank, A. Sarkar, A. Mondal, and S. Dey

Accepted at: 23rd ACM International Symposium on Formal Methods and Models for System Design (MEMOCODE, ESWEEK), ACM, 2025, pp. 1–6.

**Title: *Minimizing backbone ethernet traffic for enabling inter-zonal messages in software-defined vehicles***

Authors: A. R. Molla, R. M. C.Kota, J. Mayank, A. Sarkar, A. Mondal, and S. Dey

Accepted at: IEEE Embedded Systems Letters, 2025

**Title: *GRASP-former: A Lightweight Global-Random Sparse Attention for Domain-Aware Multi-Class Obscenity Detection***

Authors: M. Shukla, A. K. Pal, S. H. Islam, and D. Samanta

Accepted at: 40th Conference on Image and Vision Computing New Zealand (IVCNZ), 2025

**Title: *Finding a Minimum Source Set in Temporal Graphs***

Authors: S. Yadav, P. Sharma, S. Gaur, S. Swain, and S. Mandal

Accepted at: Theoretical Computer Science journal, 2025

## Writer's Pen

### Beyond Convolutions: The Capsule Revolution

Capsule Networks (CapsNets) are a new type of neural network architecture presented by Geoffrey Hinton and colleagues in 2017 to address limitations of classical convolutional neural networks (CNNs). In particular, CNNs are good at image recognition in 2D space, but they do not encode the hierarchical relationships or spatial orientations of objects well, and often fail when objects are rotated, occluded or viewed at a different angle. Capsule Networks aim to unify object recognition by encoding both the presence of features as in classical CNNs, as well as spatial relationships.

Capsules are the core building blocks of CapsNets. A capsule will be a group of neurons that will output a vector (or sometimes a matrix), instead of a scalar like a traditional neuron. The length of the vector represents the probability that a feature is present, while the orientation of the vector represents pose information, such as position, orientation, and size. This wealth of information and representation will allow the network to encode the instantiation parameters of the objects and the parts of the objects, enabling it to generalize to observing the objects from new viewpoints.

Capsule Networks use a routing-by-agreement mechanism instead of traditional max-pooling layers. This dynamic routing algorithm iteratively adjusts the weights between capsules in lower and higher layers based on how well their outputs agree. Capsules that strongly agree on the pose of an object increase their coupling, which allows the network to recognize parts as belonging to the same whole and reduces the loss of spatial information.

This architecture provides many benefits over CNNs when it is vital to comprehend spatial hierarchies among objects, such as in 3D object recognition, medical imaging, and pose estimation. Also, since routing preserves spatial relationships, CapsNets have a much greater capacity to manage representations that are robust to affine transformations, and they require fewer training samples to achieve equal accuracy than a CNN.

CapsNets are subject to challenges in computational complexity and scaling. The dynamic routing algorithm is resource intensive when compared to simple pooling in CNNs, therefore it limits the application of CapsNets to large-scale problems, or systems which require real-time processing capabilities. Ongoing research is being conducted to innovate routing algorithms, and to develop capsule concepts in conjunction with current architectures.

Overall, Capsule Networks could represent a significant step-forward in deep learning by offering a method of modelling spatial relationships in data with an intrinsically interpreted structure. The performance characteristics of CapsNets to maintain viewpoint invariance, and to encode hierarchical part-whole relationships could help redefine performance standards and benchmarks for computer vision and beyond.

- Bitra Sri Pragna (22JE0259)

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