

NOVEMBER 2024

# 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)



A good programmer is  
someone who always looks  
both ways before crossing a  
one-way street.

— Doug Linder

## The Spark of a Journey: IndiaAI Fellowship

Dheemant Dixit (21JE0310) has been selected for the IndiaAI Fellowship Award. The journey began in June during his internship as an AI Engineer at LinkedIn. With Prof. Pranav Bisht becoming his B.Tech project guide in July, he utilized the extended deadline to refine his fellowship proposal. Prof. Bisht's support was instrumental, as he facilitated a collaboration with Prof. Murari Mandal from KIIT. Together, they identified a unique and impactful research direction, creating a strong application that ultimately secured the fellowship.

### Unlearning to Preserve Privacy: The Project's Core

The project, titled "Privacy-Preserving Machine Learning Using Machine Unlearning," focuses on addressing a critical challenge in AI privacy. Machine learning models, especially LLMs, often retain user data from training, posing risks even after users opt out. Retraining models from scratch to exclude such data is computationally unfeasible. Instead, the project explores approximate unlearning methods, enabling models to forget data efficiently while maintaining functionality. This innovation is pivotal for ethical AI and compliance with privacy laws.

### Innovative Techniques for Ethical AI

The team implemented and refined several unlearning techniques, including Gradient Ascent, Fine-tuning with Random Labels, and Unlearning with Adversarial Samples. Building on these methods, they developed an innovative approach combining Gradient Ascent with KL Divergence loss, allowing models to selectively forget subsets of data while maintaining core functionality, such as generating coherent and grammatically correct outputs. This breakthrough balances privacy preservation and model performance, offering a practical, scalable solution to a pressing AI issue.

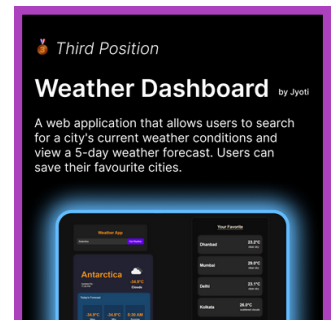
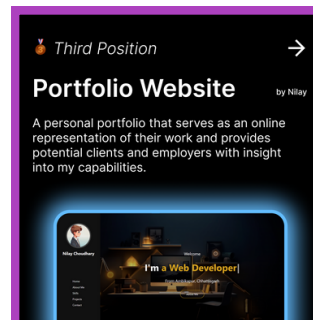
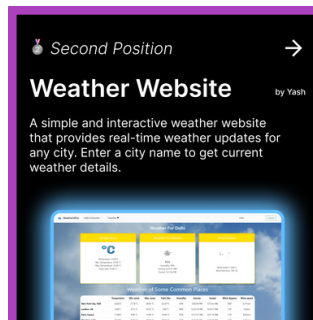
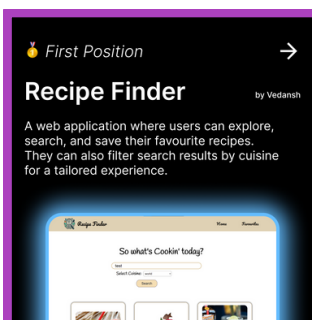


## The Recruitathon – WebCSE's Flagship Recruitment Event

The Recruitathon, organized by WebCSE, was a week-long event that challenged students to showcase their technical and problem-solving skills through a structured, project-based evaluation. Participants selected projects across three complexity levels and were assessed on three key parameters:

- Originality – Creativity and uniqueness in their approach.
- Solution Quality – Technical soundness and functional effectiveness of their solutions.
- Implementation Efficiency – Optimization and performance of their implementations.

To ensure fairness, scores were normalized across project levels for accurate comparisons. With a total prize pool of ₹6000, the event highlighted the exceptional talent within the student community, reinforcing WebCSE's commitment to fostering innovation and excellence.



## Research Scholars joined in the month of November 2024

Scholar	Supervisor
Sayooj Devdas K	Prof Mauajama Firdaus
Shiv Sagar	Prof Soumen Bag

## International Students joined in the month of November 2024

**Name:** Khushi Kumar Jha, Saurav Kumar Yadav, Sumit Kumar Mandal

## PhDs Awarded in the month of November 2024

Awardee	Supervisor	Thesis Title
Nidhi Kumari	Prof Prasanta K. Jana	<i>METAHEURISTIC-BASED OFFLOADING ALGORITHMS FOR FOG COMPUTING IN INTERNET OF THINGS PLATFORM</i>
Ayush Sahu	Prof. Haider Banka (Guide); Prof. Satish Kumar Sinha, Adani University, Shantigram, Gujarat (External Co-Guide)	<i>DETECTION AND PREVENTION OF ROOF FALL IN UNDERGROUND COAL MINES USING ARTIFICIAL INTELLIGENCE</i>
Soumya Mukherjee	Prof. Arup Kumar Pal (Guide)	<i>DESIGN OF EFFICIENT FORGERY DETECTION TECHNIQUES IN DIGITAL IMAGES</i>

## PhD Thesis submitted in the month of November 2024

Awardee	Supervisor	Thesis Title
Priyanka Roy	Prof Soumen Bag	<i>DEVELOPING DIFFERENT STRATEGIES TO IDENTIFY FORGERIES IN HANDWRITTEN DOCUMENTS</i>

## Contact Us:

Prof. Chiranjeev Kumar  
Head of the Department  
Email: [cse@iitism.ac.in](mailto:cse@iitism.ac.in)  
Phone: +91-326-2235273 (O)  
Fax: +91-326-2296563

## Credits:

Prof. Saurabh Srivastava (Faculty Coordinator)  
Saksham Jha (21JE0806)  
Abhishek Prasad Das (23MT0015)  
I. Anders Arnold (22JE0414)  
Mirthipati Krishna Balaji (22JE0573)

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