Saisab Sadhu

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Education

MS	**Indian Institute of Science Education and Research Bhopal**	May 2025 - Present

Data Science and Engineering

- **MS Thesis:** Overcoming Imperfect Retrieval Augmentation and Knowledge Conflicts in RAG Frameworks

BS	**Indian Institute of Science Education and Research Bhopal**	Dec 2021 - Apr 2025

Data Science and Engineering

- CPI: 7.08/10
- **BS Thesis:** Novel Hybrid Summarization Framework for News Analysis: Application to Interest Rate Risk Prediction
- **Coursework:** NLP, Deep Learning, Computer Vision, Machine Learning, Artificial Intelligence, Applied Optimization, Algorithms, Data Structures.

12th	**U.P.Public School**	Apr 2020

All India Senior Secondary School Examination (CBSE)

- Percentage - 92.20%
- **Coursework:** English, Physics, Chemistry, Mathematics, Biology, Physical Education.

10th	**U.P.Public School**	Apr 2018

All India Secondary School Examination (CBSE)

- Percentage - 94.40%
- **Coursework:** English, Mathematics, Science, Economics, Political Science, History, Geography, Bengali.

Technical Skills

Programming Scripting: Python, R, C++, SQL, LaTeX

Machine Learning AI: PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, XGBoost, LightGBM

LLMs & Generative AI: Hugging Face (`transformers`, `PEFT`), RAG Frameworks, Fine-tuning (DPO, LoRA), Prompt Engineering, LangChain, LlamaIndex, AutoGen

Core NLP: Vector Databases (FAISS), NLTK, spaCy, Gensim, Sentence Transformers

Publications

(Accepted) Structured Adversarial Synthesis: A Multi-Agent Framework for Generating Persuasive Financial Analysis from Earning Call Transcripts *EMNLP Workshop 2025* ⬈

- Designed **Structured Adversarial Synthesis (SAS)**, a novel multi-agent framework that operationalizes a deterministic five-act adversarial debate to generate high-fidelity financial analysis.
- Empirically validated the framework's superiority through a rigorous ablation study, demonstrating that the structured adversarial architecture significantly outperforms single-agent and cooperative baselines.

Experience

BDS Lab, IISER Bhopal | Graduate Researcher (MS Thesis) Bhopal, India
PI - Dr. Tanmay Basu | Co-PI - Dr. Biswajit Patra May 2025 - Present

- Developed **Structured Adversarial Synthesis (SAS)**, a novel hierarchical, multi-agent framework to generate nuanced and persuasive financial analysis from earnings call transcripts.
- Engineered a parallelized intelligence-gathering phase where specialist agents ground analysis in verifiable market data, factual metrics, and qualitative signals.

BDS Lab, IISER Bhopal | Undergraduate Researcher (BS Thesis)
PI - Dr. Tanmay Basu | Co-PI - Dr. Biswajit Patra
Bhopal, India
Jan 2025 - Apr 2025

- Working on a NLP based news-sentiment framework to quantify Interest Rate Risk, and to mitigate **Macroeconomic Release-Response Disparity** and daily-level risk hedging
- Currently implementing a hybrid text summarization framework that integrates BiLSTM for sequential information extraction and transformer-based abstraction, fine-tuned with reinforcement learning
- Curating an open-source financial news dataset tailored to Indian markets, designed to capture Interest Rate Risk Assesment

School of Public Policy, IIT Delhi ☑ | Research Intern
Guide - Dr. Nandana Sengupta, Dr. Ravinder Kaur and Dr. Sangeeta Kohli
New Delhi, India
May 2024 - July 2024

- Analyzed 2000+ IIT faculty profiles through IRINS data, identifying key publication and career patterns
- Discovered 12% differential in negative marking impact between genders in high-stakes examinations
- Researched the viability and impact of the 20% supernumerary quota for women at IITs

I-Lab, IISER Bhopal ☑ | Research Intern
Guide - Dr. Mitradip Bhattacharjee (Senior Member, IEEE)
Bhopal, India
May 2023 - July 2023

- Worked on PDMS/PEDOT:PSS-based pressure sensors using SLA 3D-printed molds
- Created multiple sensor prototypes through iterative design, concluding that a sphere-shaped head yielded the most optimal pressure response

Projects

Credit Risk Management and Its Impact on Indian Bank Profitability *Github Repository* ☑

- Analyzed credit-to-deposit ratios of Indian public sector banks using historical CMIE portal data
- Applied statistical modeling techniques in R and Python to examine correlations between credit policies and profitability metrics
- Developed visualizations demonstrating key relationships between risk management strategies and bank performance indicators

"PAWAMAAN" Smart Air Quality Monitoring System (v2) *Github Repository* ☑

- Optimized campus-wide IoT air quality monitoring platform by replacing Arduino with ESP32C microcontrollers for enhanced performance
- Integrated ESP32C sensors with Raspberry Pi nodes for edge processing and centralized data management

Acheivements

Top Performer, FinNLP-Earnings2Insights Shared Task @ EMNLP 2025 *Task Overview* ☑

- Achieved a **5th place globally** finish in the definitive human evaluation on the primary metric of investment accuracy.
- Secured the **#1 rank** on the official 'Win Rate vs Analyst Report' automatic evaluation metric, with our system's reports being preferred over those from professional human analysts.

Workshops & Conferences

Climate Change AI Summer School (Online) ☑ *Pittsburgh, US (2024)*

- Engaged with leading researchers on ML applications for climate science and sustainability
- Participated in hands-on workshops on climate modeling, remote sensing, and predictive analytics

7th Summer School on AI (Focus on CV & ML) ☑ *IIIT Hyderabad*

- Selected for intensive program organized by the Centre for Visual Information Technology (CVIT)
- Attended hands-on workshops on computer vision, deep learning, and related AI technologies

Position of Responsibility

Secretary, Student Development Council *Oct 2023 – Aug 2024*

- Organized institute-wide initiatives, workshops, and panel discussions to promote student growth

Founded and Lead the Entrepreneurship Cell, IISER Bhopal   *Dec 2023 - Aug 2024*
- Fostered a startup culture by hosting networking sessions and speaker events for aspiring entrepreneurs

Institute Placement Coordinator, Center for Career Development   *Aug 2022 - Oct 2023*
- Coordinated campus placements and industry outreach; achieved a notable increase in recruiter engagement