

# Abhijit Das

Founding AI Research Engineer at OnFinance AI • Bengaluru, India

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## Current Position

### OnFinance AI

Bengaluru, India

Founding Research Engineer - AI/ML and Computer Vision

June 2024 - Present

- **Custom OCR Engine Development** PyTesseract, OpenCV, YOLOv10 with 95% accuracy on financial document.
- **ODM Agents** Built an Object Oriented Database Management and Query Agent Pool that helps LLM to fetch contextual data from DB and outputs in any desired format.
- **Self-verified RAG** Engineered a custom RAG pipeline that internally generates self-introspection terminals and eliminates hallucinations and generates accurate factual content in response with higher consistency.
- **LLM Fine-tuning and Optimization** Fine-tuned SOTA (GLM, RoBERTa, LLaMA) with PEFT, LORA, & DPO.
- **WealthWISE for NSE** Developed an end-to-end web-application with ReactJS, Python, FastAPI, Mongo ATLAS, Async, Multithreading, and self-corrective RAG with open-source LLMs.
- **MLM Evaluation Strategies** Designed adversarial test sets for robustness evaluation against financial jargon.
- **Structured API Generation** Engineered a system combining GROQ, instructor and Pydantic classes with caching and multi-threading for super-fast structured API generation from Annual Reports, BRSRs, Earnings Call, Concalls, DRHPs.

## Experience

### Northwestern University, USA

Remote

Affiliate Researcher, Machine and Hybrid Intelligence Lab

Nov 2023 - Present

- **Capsule Network in Neural Cellular Automata** Segregating features from any data using capsules for using a Raspberry Pi processor. (ongoing)
- **Diffusion at the Edge** Working on a diffusion model that can be supported a cell-phone for almost realtime inference. (ongoing)

### TU Darmstadt, Germany

Remote

Affiliate Researcher, Medical and Environmental Computing (MEC-Lab)

May 2024 - Present

- **Uninterrupted Federated Learning** Innovating newer generation federated learning framework that minds your features, not your heavy weight! (ongoing)
- **Neural Cellular Automata and Tiny-LMs** Building Tiny- Language Models (TLMs) with NCA. (ongoing)

### Osaka University and Kyushu University, Japan

Remote

Research Intern, Mobile Computing Laboratory, GSIST

December 2023 - March 2024

- **Counterfactual ML for Thermal Comfort Analysis** Building lightweight ML algorithms for counterfactual machine learning and analysing comfortable habitat conditions for schools of Utrakhnad and Northern India.

### Jio Institute, India

Onsite

Pre-doctoral Researcher, Computer Vision in Medical Imaging Lab

Aug 2023 - May 2024

- **Dual Energy CT Denoising** Applied synergistic representation learning to transform noisy LDCT images into high-quality NDCT images, improving diagnostic quality.

- **Lottery Ticket Hypothesis** Explored pruning and quantization mechanisms using CKA, layerwise attention maps, and PCA for developing smaller, explainable models.
- **Uncertainty aware learning for disease detection** Investigated self-supervised and semi-supervised learning for uncertainty aware anomaly detection in radiology.

## Jio Institute, India

Onsite

Teaching Assistant, Computer Vision, Department of AI and Data Science

Feb 2024 - Mar 2024

- **Teaching Assistant** Assisted Prof. Sudipta Roy in lab sessions emphasizing hands-on learning and practical examples on computer vision and deep learning.

## Jio Institute, India

Onsite

Research Intern, Computer Vision in Medical Imaging Lab

May 2023 - Aug 2023

- **NMS Free single stage detectors** Worked on NMS free single stage detection algorithms for detection of anomalies in CXRs.

## Publications: Accepted

- **Confidence-guided Uncertainty-aware Mutual Learning for Generalized Lesion Localization in X-ray Images**  
Abhijit Das, Vandan Gorade, Snehashis Chakraborty, Komal Kumar, Sudipta Roy  
MICCAI, 2024
- **SEANet: Synergistic Spatial-Spectral Residual connections for LDCT Denoising in encoder-decoder structures** (Oral Presentation)  
Abhijit Das, Vandan Gorade, Dwarikanath Mahapatra, Kooresh Shoghi, Sudipta Roy  
ICPR, 2024
- **ProFONet: Prototypical Feature Space Optimized Network for Few Shot Classification**  
Abhijit Das, Vandan Gorade, Debesh Jha, Ulas Bagci  
ICPR, 2024
- **Enhancing Colonoscopy Outcomes with YOLOv8-Based AI for Real-Time Sessile Serrated Polyps Detection**  
Abhijit Das, Debesh Jha, Nikhil Kumar Tomar, et al.  
Digestive Disease Week International Conference, 2024
- **PAM-UNet: Shifting attention towards the region of interest in medical images**  
Abhijit Das, Debesh Jha, Vandan Gorade, et al.  
IEEE Engineering in Medicine and Biology Society, 2024

## Publications: Submitted

- **Granger Causality-based Pruning is a Superset of Magnitude Pruning** (Submitted)  
Shreyas Krishnan, Abhijit Das  
AAAI, 2025
- **ChartClair: The First Expert Made Financial Chart QA Dataset** (Rebuttal Submitted)  
Abhijit Das, Shruti Sen, Harish Vadaparty, Harshith Murthy, Priyesh Srivastava  
ICPR, 2024

- **OnFi-Bench: First Ever Financial Benchmark with Stratified Tasks in BFSI Domain** (Submitted)  
Abhijit Das, Shruti Sen, Harish Vadaparty, Priyesh Srivastava  
AAAI, 2025
- **Towards Building a Safe and Ethical AI Framework for AI and Healthcare** (Submitted)  
Abhijit Das, Debesh Jha, Ulas Bagci  
IEEE Journal, 2024 (IF- 6)

## Industrial Projects

- **Llama3.1 on Mobile Devices:** Building a tiny-Llama3.1 model fully deploy-able on mobile phones with 4 GB of VRAM and 2.2 GHz of clock speed. (ongoing)
- **Pip package of Universal Prompt Engineer:** A fully open-source pip package that acts as an experienced prompt engineer, given input, output and natural language brief use-case.
- **Automated Screening powered by Gen-AI:** Given Job description this AI BOT creates LinkedIn post, collects application, screens them, generates report and recommendation for interview, sends custom human-like mail to candidates (given permission) and generates questions based on work-experience and projects.
- **Data Harmonisation for all listed and unlisted companies in India:** Harmonising data and creating the largest reliable time-series data of Indian organisations to help BFSI and NSE in compliance and regulatory issues. (ongoing)
- **Chat BOTs for BFSI Industry:** This bot enables organisations to serve customers, on-field sales executives and relationship managers to help with product data, features and risk assessment with automation and AI powered chat assistance.
- **Financial Report Summariser:** Summerising large texts and documents into concise reports, extracting relevant key insights and financial metrics, all at once. (ongoing)

## Education

**Government College of Engineering and Leather Technology**

Kolkata, West Bengal, India

*Bachelor of Technology - Computer Science and Engineering*

*July 2019 - June 2023*

- CGPA 9.22/10.0
- **Key Courses** C Programming, Engineering Mathematics, Python, Data Structures, Machine Learning, Deep Learning

## Technical Skills

- Programming Languages C, Python, JavaScript, MATLAB, SQL,  $\text{\LaTeX}$
- AI/ML Frameworks PyTorch, TensorFlow, Langchain, LlamaIndex, Hugging Face Transformers
- Web Development React.js, Flask, CSS, Streamlit
- Cloud & DevOps AWS, GCP, Docker, Kubernetes
- Operating Systems Linux, Windows
- Soft Skills Event Management, Public Speaking, Time Management, Goal-Oriented, Self-Motivated

## Research Interests

- **Vision-Language Models (VLMs):** Multi-modal learning and representation and Cross-modal understanding and generation
- **3D Computer Vision:** Statistical shape modeling and Volumetric segmentation
- **Generative AI and AR/ VR solutions:** Virtual trial rooms with voice assistants and Industrial advertisement assistance.
- **Large Language Models (LLMs):** Fine-tuning for domain-specific tasks and Enhancing reasoning and responsive output capabilities

## Languages

**English** (Proficient), **Bengali** (Native), and **Hindi** (Proficient)

## References

### **Dr. Sudipta Roy**

Assistant Professor

Department of Artificial Intelligence and Data Science

Jio Institute, Navi Mumbai

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### **Dr. Pethuru Chelliah**

Chief Architect

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### **Dr. Debayan Ganguly**

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