Mainak Mallick

mainakmallick.github.io | mmallick7@gatech.edu | linkedin.com/in/mainakmallick | +1 (470) 830-4196

EDUCATION

Georgia Institute of Technology, College of Computing — *Atlanta, GA*
Major: Master of Science, Computational Science and Engineering, **GPA**: 4.0 — *May 2026*
Important Courses – Deep Learning (CS 7643), Computer Architecture (CS 6746), Data Mining (CSE 6470)

Indian Institute of Engineering Science and Technology — *Shibpur, India*
Major: Bachelor of Technology, Computer Science, **GPA**: 8.67/10 — *May 2022*

TECHNICAL SKILLS

Languages: Python, SQL, Java, SAS, JavaScript, C++, TypeScript
Libraries: NumPy, Pandas, Scikit-Learn, PyTorch
Tools: Git, AWS, Tableau, Kubernetes, Hadoop, Docker, CI/CD Pipeline Development, MS Azure, VS Code, Linux
Frameworks: ReactJS, NextJS, Django, Tailwind CSS, Angular, MongoDB, Apache Kafka, Hadoop, Spark

PROFESSIONAL EXPERIENCE

Predictive maintenance of Robotic Hand with Digital Twin and MAML algorithm — **GeorgiaTech**
Position - Graduate Research Assistant *(Supervisor – Dr. Seung-Kyum Choi)* — *Dec 2024-Present*

- Generated synthetic sensor data using Isaac Sim to simulate real-world movement of a KUKA LBR robot arm.
- Developed a few shot learning pipeline using the MAML algorithm for fault classification in difference joints.
- Achieved over **86.4%** testing accuracy by optimizing the model with a minimal dataset.

Full Stack Development — **GeorgiaTech**
Position - Graduate Research Assistant *(Supervisor – Dr. Seung-Kyum Choi)* — *Aug 2024-Dec 2024*

- Built responsive UIs using Vue.js and E-Charts to visualize real-time sensor data, reducing access time by 20%.
- Engineered REST APIs with Flask, integrated WebSocket and Redis, cutting data latency by 28% and supporting 30% more concurrent users.
- Streamlined CI/CD pipelines and deployments using Docker, GitHub Actions, and AWS S3, improving deployment speed by 40% and reducing manual errors by 50%.

Managed Collections and Recoveries Decision systems — **HSBC Bank**
Position - Software Engineer — *July 2022-Aug 2024*

- Built and maintained full-stack web apps for risk analysis tools using React, Node.js, and MongoDB.
- Developed REST APIs and microservices with Spring Boot, Java, and PostgreSQL for data integration.
- Deployed **24**+ business critical code changes in SAS EG and SAS ID env., impacting over **£3 million** in assets.

RELEVANT PROJECTS

Fine-Tuning LLaMA 3B for Code Completion: ReFT vs IA3 Comparison — *Jan 2025-Present*

- Compared ReFT vs IA3 for fine-tuning of LLAMA 3B model on the HumanEval benchmark for code generation.
- Analyzed ReFT's representation edits vs IA3's activation scaling in program synthesis and functional correctness.
- Benchmarked ReFT's of approximately 10.6% efficiency gains against IA3's lightweight adaptation, evaluating performance on LiveCodeBench.

Volumetric Occupancy Prediction and Semantic labelling in Indoor Scenarios — *Aug 2024-Dec 2024*

- Developed an ISO model-based framework for volumetric occupancy prediction in indoor environments.
- Integrated YOLO for real-time object detection and segmentation, ensuring accurate spatial delineation.
- Employed CLIP for semantic labeling, enabling contextual understanding of segmented indoor spaces.

AI-Powered Research Paper Recommender — *Jun 2022-Aug 2022*

- Developed an AI-powered research paper recommender using React, Node.js, MongoDB, and OpenAI API to suggest and summarize papers based on user preferences and search queries.
- Integrated external APIs (arXiv and Semantic Scholar) to fetch research papers and used OpenAI API for generating personalized summaries and recommendations.

PUBLICATIONS

- *M. Mallick, Y.-D. Shim, H.-I. Won, S.-K. Choi.* Volume 25, Issue 6, 2025."Ensemble-Based Model-Agnostic Meta-Learning with Operational Grouping for Intelligent Sensory Systems" *Sensors, MDPI.*
- *M. Mallick, A. Chakrabarty, N. Khutia.* Volume 54, Part 3, 2022. "Genetic algorithm-based design optimization of honeycomb sandwich panels of AA7075-T651 aluminium alloy" *Materials Today, ELSEVIER.*