Mrinal Jain

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Education

Georgia Institute of Technology Atlanta, GA
Master of Science in Computer Science *Graduating May 2027*
• **Concentration**: Artificial Intelligence
Bachelor of Science in Computer Science *Graduating May 2026*
• **Concentrations**: Intelligence, Systems & Architecture **GPA: 4.0**
• **Coursework**: Data Structures and Algorithms, Perception & Robotics, Computer Vision, Machine Learning, Applied Combinatorics, Probability & Statistics, Design & Analysis of Algorithms, Operating Systems, Computer Architecture

Experience

Robotics Intern June 2025 – August 2025
Georgia Tech Research Institute *Atlanta, GA*
- Set up Docker containers and improved Universal Robotics, PickNik Robotics codebases to integrate ROS2 robotic arm control algorithms with NVIDIA Isaac Sim.
- Designed and executed contact-based experiments to evaluate force-torque sensing fidelity of NVIDIA Isaac Sim.
- Tuned simulation physics for high accuracy cable insertion/extraction tasks. Achieved **100% success rate** on contact skills in Isaac Sim and **deployed to physical UR5e robotic arms** with 0 performance loss.

Data Science Intern June 2024 – August 2024
Galaxeye Space *Bangalore, India*
- Created an image segmentation pipeline including data collection, training, and deployment using PyTorch, Lightning, W&B, and GCP for aquaculture pond detection.
- Achieved **90% precision and recall** for aquaculture pond segmentation from open-source satellite imagery (Sentinel-II) despite low 10m resolution.
- Model was deployed to map **over 200,000 ponds**, leading to **insights sold to several clients**.

Undergraduate Researcher August 2024 – Present
People, AI, and Robotics Lab @ Georgia Tech | Prof. Animesh Garg *Atlanta, GA*
- Created novel data augmentation techniques for Vision-Language-Action models and Behavior Cloning Algorithms. Achieved SOTA performance (**100% success rate** on multiple tasks), paper published to **ICRA 2025**.
- Quantified the performance of several Behavior Cloning algorithms on various environments, simulators, data augmentations to prove generalization of data augmentation.
- Working on a high efficiency data platform for robotics using Apache Arrow, with features such as cloud provider integration and parallelized data pipelines.

Projects

Software Lead, RoboNav | *Competitive Mars Rovers @ Georgia Tech* August 2023 – Present
- Lead a team of 15 to create a distributed, real time ROS2 codebase in C++.
- Implemented A* and RRT path planning algorithms, terrain mapping, traversibility estimation using LiDAR, localization using Extended Kalman Filters, and trajectory following algorithms for autonomous navigation.
- Used RTSP and HLS video streaming protocols to display video feeds on custom built reactJS dashboard.
- One of 35 teams accepted to **University Rover Challenge** out of over 100.

QuickER October 2024
- Used OpenAI Whisper, Twilio to monitor 911 ambulance calls in real time and triage with **90% accuracy**.
- Developed an agentic system with Langchain using RAG, language embeddings, and Llama 3.1 to reduce patient waiting times.

Shooter Tracker (Later Synopta, Inc.) | *Co-Founder and CTO* October 2023 – July 2024
- Trained custom RT-DETR transformer models to detect firearms on CCTV, improving F-1 score by 11% over beating SoTA YOLO models. Won HackGT 2023 Innovation track.
- Implemented novel graph-based multi-camera tracking algorithms using an SQL backend with FastAPI endpoints to scale to 100+ camera systems and integrate with a Next.js dashboard.

Technical Skills

Languages: Python, C/C++, Bash/ZSH, SQL (Postgres, MySQL), JavaScript, Java, R, HTML/CSS
Frameworks: ROS, ROS2, MongoDB, CUDA, SLURM, BehaviorTree, Apache Arrow, Firebase Flask, FastAPI, React, REST APIs, Node.js, Next.js, Twilio, OAuth 2.0
Developer Tools: Git, Docker, Google Cloud Platform, vim, VS Code, clangd, Hugging Face, Jira, Eclipse, Figma
Libraries: PyTorch, Pandas, NumPy, MatPlotLib, Seaborn, OpenCV, Ultralytics, Isaac Lab, Mujoco Sim, Langchain