Shahmeel Naseem

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EDUCATION

Georgia Institute of Technology **Aug 2024 – Present**
Master of Science in Robotics – GPA 3.75 Atlanta, GA

University of Maryland, College Park **Aug 2019 – May 2023**
Bachelor of Science in Bioengineering – GPA 3.55 College Park, MD

EXPERIENCE

Georgia Tech Research Institute **May 2025 – Present**
Graduate Research Assistant Atlanta, GA

- Simulate pattern coverage by variable-scale **multi-agent systems** using **Python**, **Voronoi decomposition**, and **density estimation** on image-derived spatial targets.
- Develop and integrate **autonomy** plugins in **SCRIMMAGE** (GTRI's open-source multi-agent simulator), translating Python-based coverage and coordination algorithms into real-time autonomous behaviors using **C++.**
- Design **decentralized algorithms**, validate system-level behavior, and visualize **swarm** performance to support research in autonomous multi-robot coordination.

Robotarium **Feb 2025 – Present**
Research Assistant Atlanta, GA

- Developed software to **democratize robotics** by providing remote access to a **multi-robot** research facility.
- Migrated backend from MQTT to **ROS2**, designing real-time publisher/subscriber and server/client interfaces in **Python** and **MATLAB** for swarm robotics infrastructure.
- Leading integration of a **sensor suite** into new robot platforms, including **sensor evaluation**, **hardware interfacing**, ROS2 package development, and **simulation modeling** for accurate **SLAM** and **obstacle avoidance**.

RoboJackets **Aug 2024 – Present**
Software Sub Team Lead Atlanta, GA

- Developed and implemented **embedded control software** in **C++** on a **Teensy** microcontroller, integrating sensor inputs, motor drivers, and actuator control for autonomous operation.
- Designed and programmed real-time **navigation**, opponent detection, and strategy logic using **state machines** and **sensor fusion** techniques.
- Led software development using **Git**, managing feature branches, code reviews, and iterative integration with hardware and electrical sub teams.

PROJECTS

Autonomous Maze Navigation **Jan 2025 – Apr 2025**
Georgia Institute of Technology Atlanta, GA

- Developed **ROS2** packages using **Python** for TurtleBot3 using **LiDAR**, **SLAM**, **PID control**, and image-detection using **OpenCV** for autonomous maze traversal.
- Implemented **path planning**, **localization**, and **sensor fusion** techniques to enable robust navigation of environments.
- Utilized **Ubuntu**, **Bash** scripting, and **Git** for pipeline automation and **version control**; modeled robot **dynamics** and performed real-time **debugging** in simulation and hardware.

Airline Delay Prediction **Jan 2025 – Apr 2025**
Georgia Institute of Technology Atlanta, GA

- Built a machine learning pipeline in **Python** using **Pandas** and **scikit-learn** to forecast flight arrival delays from weather and airline data, emphasizing **data preprocessing** and modeling.
- Applied **feature engineering** and Principal Component Analysis **(PCA)** for dimensionality reduction and data enhancement, improving model robustness and performance.
- Trained and evaluated **Ridge** and **Linear Regression** models using **k-fold cross-validation** and **RMSE** to assess accuracy and tune hyperparameters for generalization.

SKILLS

Technical: Computer Vision | Image Processing | Sensor Fusion | SLAM | Localization | State Estimation | Kalman Filtering | Particle Filtering | Bayesian Inference |Path Planning | Control Theory | Networked Control | Graph Theory | PID Control | Discrete Time Control | Machine Learning | Kinematics & Dynamics | Optimization | Linear Algebra | Embedded System Design | Hardware-Software Integration | Technical Documentation | Real-Time Systems

Software/Tools: Python | C++ | ROS2 | Git | Linux | VSCode | Gazebo | Rviz | MATLAB | Docker | SolidWorks | LaTeX