

Soumith Batta

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Summary

Experienced Robotics and Machine Learning Engineer currently pursuing a graduate degree in Robotics, I am eager to contribute my expertise as a Robotics Engineer with a specialization in Computer Vision. Equipped with strong problem-solving skills in machine learning and control systems, and a proven ability to develop innovative solutions in collaborative environments.

Education

University of Minnesota-Twin Cities

MASTER OF SCIENCE IN ROBOTICS

Minneapolis, MN, US

Sep. 2024 - Expected May 2026

IIT Kanpur (Indian Institute of Technology Kanpur)

BACHELOR OF TECHNOLOGY IN AEROSPACE ENGINEERING

Kanpur, India

Nov. 2020 - Jul. 2024

Skills

Programming	C/C++, HTML, Python, Matlab, SQL, Java, GoLang
Tools & Softwares	Fusion 360, MeshLab, Git, LabVIEW, Adobe Lightroom, Qualisys Track Manager, Blender
ML Tools	PyTorch, TensorFlow, Keras, SciKit-Learn, NLTK, Spring-Boot, Hibernate, NodeJS, Bootstrap
Robotics	Linux, ROS, Gazebo, OpenCV, QGroundControl, PX4, RViz, Meshlab, RoboDK
Hardware	Raspberry PI, Nvidia Jetson, Arduino, Ordroid, PixHawk, Motor Controllers, ESP32

Work Experience

Space Dynamics and Flight Control Laboratory, IIT Kanpur

UNDERGRADUATE STUDENT RESEARCHER

Kanpur, India

Jan. 2024 - Aug. 2024

- Implemented MPC-based UAV landing system in ROS/Gazebo, achieving 8-second touchdown on moving UGV platform.
- Integrated EKF-based trajectory tracking in Python, maintaining 93.8% landing accuracy in 15 mph wind conditions.
- Designed a realtime 3D simulation environment in Gazebo to test autonomous recharging protocols, accelerating development time by 40%

ADMIRE Research Center, Carinthia University of Applied Sciences (FH Kärnten)

RESEARCH INTERN

Villach, Austria

May. 2023 - Jul. 2023

- Engineered geometric inverse kinematics solution using ROS/Python, reducing configuration errors by 87% in harvesting motion.
- Designed kinematics-based control system with quaternion interpolation, achieving sub-millimeter positioning accuracy.
- Implemented real-time motion planning in ROS, reducing harvest cycle time by approximately 25%.

Intelligent Guidance Control Laboratory, IIT Kanpur

RESEARCH INTERN

Kanpur, India

May. 2022 - Aug. 2022

- Developed swarm consensus algorithms in ROS/Gazebo, coordinating 8 quadrotors with 98% formation accuracy with no obstacles.
- Engineered ESP32-based mesh network protocol, reducing communication latency to 50ms between swarm nodes.
- Integrated MoCap and RTK-GPS data, achieving 2cm position accuracy for outdoor-indoor transitions.

Key Projects

GRU-Based Temporal Modeling for Model Predictive Control

COURSE PROJECT, INTRODUCTION TO ROBOTIC SYSTEMS

Sep. 2024 - Nov. 2024

- Developed a GRU-MPC network using TensorFlow and Keras, enhancing state estimation accuracy by 36% and achieving a test MSE of 0.0138.
- Implemented GA optimization with DEAP library for hyperparameter tuning, reducing computational overhead by 40%.
- Engineered one-hot encoded trajectory sequences and preprocessed data, improving temporal modeling and trajectory tracking.

6D-Gauss: Camera 6D Pose Estimation from a Single RGB Image

COURSE PROJECT, ROBOT VISION

Sep. 2024 - Dec. 2024

- Developed a 6DoF camera pose estimation system using 3D Gaussian Splatting, achieving a 63% reduction in translational error.
- Integrated Radiant Ellicell ray casting with multi-head attention for robust optical center alignment and noise handling.
- Achieved 28.5% improvement in angular error compared to baseline methods on the Barn dataset, showcasing enhanced accuracy.

DRDO's UAV-Guided UGV Navigation Challenge

INTER IIT TECH MEET-10.0, KHARAGPUR

Feb. 2022 - Mar. 2022

- Awarded 2nd place among teams from 23 Indian Institute of Technology (IITs), India's premier engineering institutions, for developing a UAV-guided UGV system optimized for autonomous navigation in snow-covered terrain.
- Implemented FSM architecture with Gazebo plugins, enabling seamless UAV-UGV coordination for terrain mapping.
- Engineered visual odometry system using UAV nadir camera, achieving real-time UGV position tracking.