Akaash S S

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Education

Indian Institute of Technology (IIT) Guwahati **Guwahati, India**
*Bachelor of Technology in Mechanical Engineering [CGPA: **8.38/10**]* *July 2023 – Present*
*Minor in Electronics and Communication Engineering [CGPA: **9.5/10**]*

Publications

- **S. S. Akaash**, A. Jagadeeshwaran, S. Sivakumar, B. Sangeetha, and S. Surendiran, "Adaptive and Intelligent Control Approaches for Industrial Robots: Methods, Architectures, and Emerging Trends," *IETE Technical Review*, communicated 2025.

Projects

Delta Robot Kinematic Modeling and Control *Mar. 2025 – Jun. 2025*
- Designed and assembled a **Delta robot CAD model** in SolidWorks.
- Implemented **forward and inverse kinematics** in MATLAB and performed **workspace and manipulability analysis**.
- Developed **trajectory generation** in Simulink and applied a **PID controller with feed-forward compensation** for precise motion control.

Autonomous Mobile Robot Simulation *Nov. 2024 – Jan. 2025*
- Built a differential drive robot in **ROS2 Jazzy** and **Gazebo Harmonic** with LiDAR and camera sensors.
- Integrated **SLAM Toolbox** and **Nav2** for autonomous navigation in simulated environments.
- Implemented real time **ball tracking** using **OpenCV** and enabled **teleoperation through Foxglove services**.

Autonomous Energy Management and Charging Decisions for Electric Vehicles *May. 2025 – Aug. 2025*
- Developed **energy-efficient velocity and torque computation algorithms** in **Simulink**, exported as **FMUs**, and validated within **IPG CarMaker** for dynamic driving scenarios.
- Designed a **real-time charging decision algorithm** in **Python–MATLAB** for optimizing **battery SoC and travel time** under variable traffic and terrain conditions.
- Created **EV and charging station agents** and integrated them with **KUKSA DataBroker and Fetch.ai uAgents**, enabling **communication and coordination for intelligent energy management**.

Technical Skills

Programming & Simulation: Python, MATLAB, Simulink, ROS2, Gazebo, OpenCV

CAD & Design: SolidWorks, Fusion 360

Other Tools: Git, Docker, Foxglove, Ubuntu

Coursework

Dynamics of Machinery	Kinematics of Machinery	Control Systems*
Design of Machine Elements	Digital Circuits	Electrical Machines

**Spring 2026*

Leadership Experience

Vice Captain *Mar. 2025 – Present*
IITG Racing, Formula SAE
- Led a 60+ member team in building IITG Racing's first Formula Student EV, coordinating 7 subsystems and managing cross-functional teams for integration, planning, and resource management.

Achievements

- **Motor Cooling System Design:** Secured 2nd place at Kriti '25 Inter-Hostel Tech Competition for designing an FSEV motor cooling system.
- **Academic Ranking:** Ranked 8th among 116 students in Mechanical Engineering at IIT Guwahati.
- **JEE Advanced:** Secured All India Rank 9150 among 1.8 lakh+ candidates nationwide.
- **JEE Mains:** Secured All India Rank 9756 among 1 million+ candidates nationwide.