SAHIL T CHAUDHARY

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EDUCATION

Carnegie Mellon University *Pittsburgh, PA*

Master of Science in Mechanical Engineering – Research | **GPA:** 4.0/4.0 *May 2025*

- **Relevant coursework:** Planning and Decision Making, Introduction to Robot Learning, Optimal Control and Reinforcement Learning, Robot Localization and Mapping, Modern Control Theory, Machine Learning, Robot Dynamics and Analysis

Vellore Institute of Technology *Vellore, India*

Bachelor of Technology in Mechanical Engineering | **GPA:** 9.05/10.0 *May 2022*

- **Relevant coursework:** Robotics, CAD/CAM, Design of Machine Elements

SKILLS

Knowledge Areas: Controls | Planning | SLAM | Robot Dynamics | Machine Learning | CAD | Mechanical Design | 3-D Printing

Tools and Software: C++ | Python | Git | ROS | Gazebo | Linux | Docker | MATLAB | Julia | SolidWorks | Ansys | Fusion 360 | CoppeliaSim

WORK EXPERIENCE

Biorobotics Lab, The Robotics Institute *Pittsburgh, PA*

Graduate Research Assistant, ***Supervisor:*** *Dr Matthew J. Travers* *August 2023 – Present*

- **Convoy**
  - Developed a Heterogenous Convoy framework comprising RC Cars and Quadruped Robots
  - Devised a framework wherein the robots Rendezvous at the nearest intersection and then Go Home as a convoy
- **Payload Redesign**
  - Redesigned the payload of RC Cars and a Quadruped Robot, making it **20% lighter** and lowering the Centre of Gravity
  - Engineered a modular design with serviceability and accessibility as the aim
  - Incorporated sensors, including LIDAR, IMU, and two cameras, along with the on-board computer, motor controller, and circuit boards while ensuring optimal field of view of the sensors

Carnegie Mellon University's College of Engineering *Pittsburgh, PA*

Course Assistant, ***Supervisor:*** *Dr Levent Burak Kara* *January 2024 – May 2024*

- Assisted in teaching the Machine Learning and Artificial Intelligence for Engineers course to graduate students

ArcelorMittal Nippon Steel India Limited *Hazira, India*

Graduate Engineer Trainee – Corex Operations, ***Supervisor:*** *Mr Akhil Timani* *June 2022 – March 2023*

- Ensured the smooth running of different processes such as conveyors, skip charging, coal blending, coal drying, slag granulation plant, and machinery involved in all the areas within Material Handling and the Corex Process
- Assisted and collaborated with Field Engineers to resolve problems such as malfunctioning, errors, or issues with the equipment and machinery, ensuring the safety and productivity of the Plant

PROJECTS

Automated Comms-Based Peel-off for Multiple Robot Convoys *Pittsburgh, PA*

Carnegie Mellon University – Research Project *August 2024 – November 2024*

- Devised an algorithm to ensure communication fidelity is maintained among robots
- Generated a Max-Min Spanning Tree to maximize the distance the robots travel before peeling off
- Validated the algorithm by deploying it on robots using proprietary radios

Model Predictive Path Integral Control [GitHub] *Pittsburgh, PA*

Carnegie Mellon University – Course Project *February 2024 – April 2024*

- Implemented MPPI on an RC car platform using C++ and ROS to enable aggressive driving
- Accomplished obstacle avoidance by utilizing a Costmap generated by a Voxel Grid
- Compared the performance between MPPI and an existing iLQR controller – MPPI generates faster paths

Point-LiDAR Inertial Odometry [GitHub] *Pittsburgh, PA*

Carnegie Mellon University – Course Project *February 2024 – April 2024*

- Implemented Point-LIO using C++ and GTSAM to overcome the drawbacks of frame-based LiDAR processing
- Overcame IMU saturation in aggressive motion by modeling it as part of the state vector
- Used an Extended Kalman Filter (EKF) framework to achieve successful state estimation

CMU Buggy [GitHub] *Pittsburgh, PA*

Carnegie Mellon University – Course Project *October 2023 – December 2023*

- Deployed and tuned a PID controller for a Tesla Model 3, using Webots
- Analyzed the controllability and stability of the system
- Developed LQR and MPC controllers with A-Star planner for the same system, and performed EKF-SLAM