

# 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:** Optimal Control and Reinforcement Learning, Robot Localization and Mapping, Modern Control Theory, Machine Learning and Artificial Intelligence, Robot Dynamics and Analysis, Computer Vision for Engineers

### 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

Pittsburgh, PA

Graduate Research Assistant

August 2023 – Present

- **Convoy**
  - Developed a Heterogenous Convoy framework comprising RC Cars and Quadruped Robots
  - Developed 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
  - Developed 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 for Machine Learning and Artificial Intelligence for Engineers

January 2024 – May 2024

- Assisted Professor L. Burak Kara in teaching machine learning and artificial intelligence principles to graduate students

### ArcelorMittal Nippon Steel India Limited

Hazira, India

Graduate Engineer Trainee – Corex Operations

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

### 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
- Compared the performance between MPPI and an existing iLQR controller – MPPI generates faster paths
- Accomplished obstacle avoidance by utilizing a Costmap generated by a Voxel Grid

### 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

- Implemented and tuned a PID controller for a Tesla Model 3, using Webots simulator
- Used Pole Placement to generate an optimal Gain matrix, and analyzed the controllability and stability of the system
- Developed an LQR controller for the same system, as a comparison to the PID controller, and performed EKF-SLAM

### Re-sizeable Autonomous Cleaning Robot [\[GitHub\]](#)

Vellore, India

Vellore Institute of Technology – Final Semester Project

January 2022 – May 2022

- Led a team of three to design a Cleaning Robot that can re-size itself (**between 30 cm and 50 cm in length**), using Fusion 360
- Conducted a simulation study using Ansys and CoppeliaSim (V-REP) to demonstrate proof of concept
- Developed a physical prototype using Raspberry Pi 4, and programmed it using Python