SAHIL T CHAUDHARY

sahilchaudhary.sc36@gmail.com | +1 412 696 6827| www.linkedin.com/in/sahiltc/ | sahiltchaudhary.github.io/

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 | Simultaneous Localization and Mapping | Robot Dynamics | Machine Learning | Computer-Aided Design | Mechanical Design | 3-D Printing
Tools and Software: C++ | Python | Git | ROS | Gazebo | Linux | 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   *Spring 2023*
- 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   *Spring 2023*
- 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   *Fall 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   *Spring 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