

May 2024 graduate seeking full-time opportunities in Planning and Autonomy

## EXPERIENCE

**Amazon Robotics**, *SDE Intern (C++ Specialist)* | Westborough, MA May 2023 – Aug 2023

- Implemented collision modelling and motion planning for 6-DOF manipulator arm operating on unpackaged items
- Developed sensor driver for Intel Realsense D455 and pushed to Amazon's internal version control system
- Achieved 50% speedup in failure handling of dropped packages via suction feedback and low-level interrupts

**Robotic Exploration Lab**, *Research Assistant* (Prof. Zac Manchester) | Pittsburgh, PA Nov 2022 – Present

- Performing task planning using search-based planning methods over locomotion skills for the [Unitree Go1](#) robot
- Devised mixed-integer quadratic program for footstep planning on biped robot to traverse discontinuous terrains

**Goldman Sachs**, *Analyst* | Bengaluru, India Jul 2021 – Jul 2022

- Ideated and executed payment structures for mortgage-backed securities in multi-national desk of 15 members
- Achieved steep improvement of 1.62% profits by optimizing cash-flows through derivative instruments

**Google Summer of Code – JdeRobot**, *Student Developer* | Remote Jun 2021 – Aug 2021

- Migrated Robotics Academy Docker Image from ROS 1 to ROS 2 and built VNC-based RViz 2 web interface
- Deployed project to the production environment as the new Robotics Academy ROS 2 Foxy image
- Post-GSoC, headed JdeRobot's ROS 2 Working Group as an open-source contributor till Aug 2022

**Stride – Quadruped Team**, *Co-founder and Team Lead* | Mumbai, India Dec 2019 – May 2021

- Led a two-tiered team of 15 members, overseeing a budget of 14,000 USD granted by IIT Bombay
- Demonstrated real-time SLAM via sensor fusion of cost-effective IMU sensor and RealSense PointCloud data
- Modelled virtual leg compliance with impedance control and simulated gaits using Bézier curve foot trajectories

## EDUCATION

**Carnegie Mellon University, School of Computer Science** | GPA: [3.96 / 4.00](#) Pittsburgh, PA

Robotic Systems Development (Master of Science)

May 2024

Courses: Computer Vision, Optimal Control and RL, Planning and Decision-making, Robot Learning

Achievements: [J.N. Tata Scholar](#); ICRA 2023 [Quadruped Robot Challenge](#): Travel grant to London and 3<sup>rd</sup> Prize

**Indian Institute of Technology Bombay** | GPA: [9.43 / 10.00](#) Mumbai, India

Mechanical (Bachelor of Technology with Honors), Computer Science (Minor)

Aug 2021

Courses: Foundations of Learning Agents, Design & Analysis of Algorithms, Design of Mechatronic Systems

Achievements: Technical Citation; [ROS Conference](#) 2021: Delivered two lightning talks

1<sup>st</sup> Prize: International Micromouse Challenge, Off-track Bot (National), Operations Competition (IIT Bombay)

## SKILLS

Programming: C++, CMake, CUDA, Java, Julia, MATLAB, Python, Scripting (Bash, Sed, Awk, Perl, RegEx)

Robotics: Drake, Fusion360, Gazebo, Isaac Gym, MoveIt, MuJoCo, OpenCV, PyTorch, ROS 1/2

Software: Docker, Git, Jira, LaTeX, Linux, Protobuf, Vim

Optimization: CppAD, GLPK, GNU MathProg, Gurobi, IPOPT, OSQP, PuLP

## PROJECTS

**Autonomous Search Quadruped in Narrow & Cluttered Terrains** | *MRSD Capstone, CMU* Sep 2022 – Present

- Implementing exploration of unknown room with trapped humans using TARE Planner and Superodometry
- Devised Non-linear Model Predictive Control and performed model reference tracking using Whole Body Control
- Deployed custom controller on [Unitree Go1](#) that exceeded stretch requirements for robust locomotion over clutter

**Jenga Playing Manipulator Arm** | *Robot Autonomy, CMU* Feb 2023 – Apr 2023

- Implemented detect and grasp pipeline for the [Franka Emika Panda](#) robot to detect Jenga blocks and build tower

**Robot Vision Scene Understanding Challenge** | *CVPR 2021 Competition* Mar 2021 – Apr 2021

- Built object-based 3D semantic map utilizing RGBD & odometry measurements from robot traversing environment
- Devised consensus-based parallel perception pipeline between YOLOv4, VoteNet, and Group-Free 3D
- Applied 3D NMS algorithm to obtain semantic map of environment with bounding boxes around detected objects

**F1/10th – Autonomous Grand Prix** | *IROS 2020 Competition* Oct 2020

- Leveraged Bernstein polynomial based local trajectory planner & MPC for Ackermann steering in 4-member team
- Acquired global optimal path via Operator Splitting quadratic program solver and implemented obstacle detection