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EXPERIENCE

Tesla, Robotics Machine Learning Engineer | Palo Alto, CA

Jul 2024 – Present

- Training behavior models for Optimus (Tesla's humanoid robot) in Navigation and Motion Planning team
- Boosted resilience and performance of navigation task with a XX% reduction in runtime
- Developed XX strategy which achieved XX% reduction in operator interventions

Amazon Robotics, SDE Intern (C++ Specialist) | Westborough, MA

May 2023 – Aug 2023

- Implemented RRT-based motion planning for suction-based manipulator arms operating on unpackaged items
- Identified critical issue that the arm continued full pick-and-place motion even if the package was dropped
- Pinpointed the issue to a mutex that blocked the suction state from updating in the behavior tree's blackboard
- Confined the scope of this mutex resulting in a remarkable 50% speedup in these failure cases

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 Docker Image from ROS 1 to ROS 2 Foxy, constructed RViz 2 web interface, and deployed to production
- Post-GSoC, headed JdeRobot's ROS 2 Working Group for a year as an open-source contributor

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
- Modelled virtual leg compliance with impedance control and implemented gaits using Bézier curve trajectories

EDUCATION

Carnegie Mellon University, School of Computer Science | GPA: 3.97 / 4.00

Pittsburgh, PA

Master of Science in Robotic Systems Development (MRSD)

May 2024

Courses: Deep Learning, Optimal Control, SLAM, Planning and Decision-making

Achievements: J.N. Tata Scholar; ICRA 2023 Quadruped Robot Challenge: Travel grant to London and 3rd Prize

Indian Institute of Technology Bombay | GPA: 9.43 / 10.00

Mumbai, India

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

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

1st Prize: Micromouse Challenge (International), Off-track Bot (National), Operations Challenge (IIT Bombay)

PROJECTS

[Demos and More Projects](#)

Long Horizon Task Planning for Quadruped Robot | Research Project, CMU

Sep 2023 – Apr 2024

- Learned locomotion skills like climbing, jumping, and walking using PPO and curriculum-learning in Isaac Gym
- Constructed an A* planner, guided by a learned cost predictor, to generate time and energy-efficient paths
- Implemented a novel anytime dataset generation method in Isaac Gym with diversity guarantees for training data
- Achieved a significant 13% reduction in energy and 29% reduction in time compared to a walking-only planner

Autonomous Quadruped in Unknown Cluttered Terrains | MRSD Capstone, CMU

Sep 2022 – Dec 2023

- Devised NMPC tracked using reactive WBC and integrated it with exploration and LiDAR-based localization stacks
- Implemented safety features for disaster sites & demonstrated on-demand temporary takeover by safety operator
- Led to exploration rate of 16 m²/min and impressive 95% repeatability rate in debris-filled terrain with narrow doors
- Demonstrated my robot at Quadruped Robot Challenge (ICRA 2023-London), securing 3rd prize for Carnegie Mellon against top institutions like MIT and KAIST

Quadruped Robot Challenge | ICRA 2023 Competition, London

May 2023 – Jun 2023

- Deployed controller to Unitree Go1 & navigated challenge course using Beyond Visual Line-of-Sight teleoperation
- Recovered from falls using pre-defined maneuvers and achieved the third position representing Carnegie Mellon

Robot Vision Scene Understanding Challenge | CVPR 2021 Competition, Remote

Mar 2021 – Apr 2021

- Built object-based 3D semantic map utilizing RGBD & odometry measurements from robot traversing environment
- Devised consensus between YOLOv4 & 3D detection techniques (VoteNet, Group-Free 3D) to improve confidence
- Applied 3D NMS algorithm to obtain semantic map of environment with bounding boxes around detected objects

F1/10th – Autonomous Grand Prix | IROS 2020 Competition, Remote

Oct 2020

- Leveraged Bernstein-polynomial based local trajectory planner & model predictive control for Ackermann steering
- Acquired global optimal path via Operator Splitting quadratic program solver and implemented obstacle detection