SIDDHARTH SAHA

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EDUCATION

Carnegie Mellon University, School of Computer Science Pittsburgh, PA
Master of Science, Robotic Systems Development | GPA: 4.00 / 4.00 *May 2024*
Selected Coursework: Optimal Control and RL, Manipulation and Control, Robot Autonomy, Computer Vision
Achievement: J.N. Tata Scholarship, 97 scholars out of 1700+ applicants

Indian Institute of Technology Bombay Mumbai, India
Bachelor of Technology (Honors), Mechanical with Minors, Computer Science | GPA: 9.43 / 10.00 *Aug 2021*
Selected Coursework: Planning for Legged Robots, Reinforcement Learning, Algorithm Design, Linear Algebra
Achievements: Technical Citation; ROS Conference 2021: Two lightning talks accepted

SKILLS

*Programming***:** C++, Python, CMake, MATLAB, Julia, Java
*Software***:** Git, Docker, Linux, PyTorch, ROS 1, ROS 2, Jira
*Optimization***:** MathProg, GLPK, Gurobi, PuLP, IPOPT, OSQP

EXPERIENCE

Amazon Robotics, *C++ System Development Engineer Intern* | Westborough, MA *May 2023 – Aug 2023*
• Prototyping a novel perceptual approach to guide manipulation robots using a rich understanding of the scene

Robotic Exploration Lab, *Research Assistant* (Prof. Zac Manchester) | Pittsburgh, PA *Nov 2022 – Present*
• Implemented hybrid trajectory optimization for a biped in simulation to traverse unknown rough terrains

Goldman Sachs, *Analyst* | Bengaluru, India *Jul 2021 – Jul 2022*
• Ideated and executed payment structuring ideas for mortgage-backed securities in multi-national desk of 15 members
• Achieved sharp 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 from ROS1 to ROS2 and built VNC-based RViz2 web interface
• Pushed contributions to **production environment** as the new Robotics Academy ROS2 Foxy image

PROJECTS

Jenga Playing Manipulator Arm | *Robot Autonomy, CMU* *Feb 2023 – Present*
• Designing probe and grasp pipeline for the Franka Emika Panda robot to build Jenga tower and extract loose blocks

DarkBot – Search and Rescue Quadruped | *MRSD Capstone with AirLab, CMU* *Sep 2022 – Present*
• Leading 4-member team to achieve **autonomous exploration** by the Unitree Go1 in human untraversable environments
• Achieved SLAM in simulation via LIO-SAM, pointcloud matching via NDT localization, & navigation via TEB local planner
• Performed trajectory optimization using Nonlinear MPC and model reference tracking (MRT) via Whole Body Control

Quadruped Robot | *RoboCup Rescue League Challenge* *Dec 2019 – May 2021*
• **Founded and led** a two-tiered team of 15 members, overseeing a budget of 14K USD granted by IIT Bombay
• Modelled virtual leg compliance with impedance control and simulated gaits with Bézier curve foot trajectories using C++

Robot Vision Scene Understanding Challenge | *CVPR 2021, Nashville* *Mar 2021 – Apr 2021*
• Built object-based 3D semantic map utilizing RGBD and odometry measurements from robot traversing environment
• Implemented **parallel perception pipeline** of YOLOv4 with 3D detection techniques (VoteNet, Group-Free 3D)

F1/10th – Autonomous Grand Prix | *IROS 2020, Las Vegas* *Oct 2020*
• Leveraged Bernstein polynomial based local trajectory planner and MPC for Ackermann steering in 4-membered team
• Acquired global optimal path via Operator Splitting Quadratic Program (OSQP) solver & implemented obstacle detection

LEADERSHIP

MRSD Representative, CMU: Serving as the liaison between MRSD and the Robotics Institute *Jan 2023 – Present*
Mentor, Summer of Science: Guided 4 mentees with Data Structures and Algorithms *Apr 2020 – Jun 2020*
Teaching Assistant, IIT Bombay: Tutored 70+ students across two freshmen courses *Jan 2019 – Apr 2019*
Convener, Electronics & Robotics Club: Guided 600+ freshmen with their first wheeled robot *Apr 2018 – Mar 2019*

COMMUNITY AND VOLUNTEER WORK

JdeRobot: Heading JdeRobot's ROS2 Working Group as an open-source contributor *Mar 2021 – Aug 2022*