SIDDHARTH SAHA

+1-412-214-2516 | sahasiddharth611@gmail.com
linkedin.com/in/sahasiddharth611

cs.cmu.edu/~ssaha3
github.com/trunc8

EXPERIENCE

Tesla, *Robotics Machine Learning Engineer* | Palo Alto, CA   *Jul 2024 – Present*
• Trained and deployed behavior models for Optimus, contributing across vision-based planning, RL locomotion,
  tokenizer development, data collection pipelines, and robot policy rollout
• Rewrote the navigation task used across the robot fleet, increasing resilience and slashing runtime by 95%
• Developed deadlock mitigation strategy which achieved 50% reduction in operator interventions due to bot traffic

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

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: Won travel grant to London & 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
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 m^2/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

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

SKILLS

Programming: C++, Python, Docker, Git, Linux, PyTorch, TensorFlow
Robotics: ROS/ROS2, Isaac Gym, MuJoCo, Motion planning (RRT, A*), Optimal control, Computer vision