Sayan Mondal

+1(858) 703 7251 • sayanmon@cs.cmu.edu • Website • in 6sayan1

Education

- **Carnegie Mellon University, Robotics Institute** — Sept 2022 - present
  Master of Science in Robotics — 4.10/4.00 GPA
- **Carnegie Mellon University** — Sept 2020 - May 2022
  Master of Science in Biomedical Engineering — 3.88/4.00 GPA
- **University of California San Diego** — Sept 2017 - April 2020
  Master of Science in Engineering Sciences (Mechanical Engineering) — 3.67/4.00 GPA
- **Jadavpur University, Kolkata, India** — May 2012 - June 2016
  Bachelor of Engineering in Mechanical Engineering — 8.00/10.00 GPA

Research Experience

Long-Horizon Task Planning for Quadruped Robot | *Research Assistant, CMU* Aug'23 - present

- Implemented and trained Deep-Reinforcement Learning policies in Isaac Gym to enhance the locomotion capabilities of quadrupedal robots. Successfully achieved sim-to-real transfer through domain-randomization and distillation techniques on a Unitree Go1 robot.
- Engineered a comprehensive dataset capturing time, energy, and success costs associated with the local motions of a quadruped in diverse simulated environments. Trained a specialized cost predictor Neural Network using this dataset to enable efficient decision-making.
- Demonstrated long horizon task planning with user-defined objectives like minimum-time and minimum-energy using A* search guided by the cost predictor.
- Exploring other planning frameworks for quadrupedal locomotion, leveraging diffusion-driven techniques in order to improve on speed and genarilization capabilities.

Semantically-Augmented Gaze Detection Network for Autonomous Driving | *UCSD* Jan'19 - Feb'20

- Developed Semantics Augmented GazE (SAGE), an innovative attention mechanism integrating scene semantics and human gaze data for accurate prediction of an autonomous vehicle's focus of attention in driving scenarios.
- Addressed limitations in existing gaze-only models, considering factors like peripheral vision, single focus, distracted gaze, and center-bias. Proposed solutions include object tracking, targeted object detection, and careful consideration of relevant driving-related objects.
- Conducted experiments evaluating SAGE's flexibility, robustness, and adaptability across various driving datasets, including critical scenarios like intersections and busy traffic regions.

Underactuated Micro-Gripper for Mobile Micro-Robots, *Gravish lab, UC San Diego* Sept'18 - June'20

- Implemented a closed-chain linkage mechanism for a novel gripper, enabling simultaneous bending and object grasping.
- Conducted rigorous kinematic and static analyses for a thorough understanding of the gripper's performance.

Publications

1. Anwesan Pal, **Sayan Mondal**, Henrik I. Christensen,**"Looking at the right stuff"- Guided semantic-gaze for autonomous driving**, *IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2020*.
2. **Sayan Mondal**, **"Design and analysis of a kirigami-based two-finger microgripper"**, *Masters' thesis, 2020*.

Skills

- Programming: Python, C++, CMake, CUDA, Java, Julia, MATLAB, Scripting(Bash)
- Robotics: Isaac Gym, MuJoCo, Gazebo, MoveIt, Fusion360, OpenCV, ROS
- Deep Learning: PyTorch, TensorFlow, Keras, Caffe, Simulink
- Software: Git, LaTeX, Linux, Vim