Sayan Mondal

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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

demos & more projects

Long-Horizon Task Planning for a Quadrupedal Robot | *Research Assistant, CMU* Aug'22 - present

- Developed quadrupedal locomotion skills via Deep Reinforcement Learning in Isaac Gym. Executed sim-to-real transfer on a Go1 robot using domain-randomization and distillation techniques.
- Built dataset for local motion costs; trained multi-head neural network as cost predictor for the global planner, thus enabling informed decisions in path planning.
- Demonstrated long horizon task planning with user-defined objectives using A* search guided by the cost predictor. Currently, exploring other planning frameworks, leveraging diffusion-driven techniques in order to improve on speed and generalization capabilities.

Multi-Object Tracking for Recycling Facility Automation | *RA, Biorobotics Lab* May'21 - May'22

- Led a five-member team in automating the Gateway Recycling Facility, Pittsburgh.
- Developed a robust camera-based system for detecting and tracking materials on a conveyor belt, ensuring re-identification across multiple cameras.
- Implemented a sequential model classifier, enhancing stability and accuracy in classifying moving objects, by considering both spatial and temporal components for predictions.

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

- Developed 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.
- Mitigated gaze-only model's limitations through predicted saliency maps that learn to capture semantic context in the environment, while retaining the raw gaze information.

Controls and Perception Researcher, *Contextual Robotics Institute, UCSD* Nov'18 - March'20

- Tested and modified AUTOWARE (an open source ROS-based software for autonomous driving) on Polaris GEM. Involved in the development of steering and throttle control based on the kinematic model.
- Devised an intersection-logic algorithm and built a simulator for testing its performance across diverse intersection scenarios.

Work Experience

- **Teaching Assistant**: Supported 7+ graduate and undergraduate courses. March '18 - present
- **Systems Engineer Intern**: Helped in the automation process at the hot strip mill part of the steel plant of Larson and Toubro Limited, India. May'15 - July'15

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"**, *MS thesis, 2020.*

Skills

- Programming: Python, C++, CMake, CUDA, Java, Julia, MATLAB, Scripting(Bash)
- Robotics: Isaac Gym, MuJoCo, Gazebo, MoveIt, Fusion360, OpenCV, ROS, PyTorch, Simulink