Sagar Parekh

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Education

Virginia Polytechnic Institute and State University *Blacksburg*

PhD in Mechanical Engineering   Sep. 2021 - Present

Nirma University *Ahmedabad*

B. Tech. in Mechanical Engineering   Sep. 2015 - May. 2019

Research Projects

Graduate Research Assistant *Virgina Tech*

Advisor: Dr. Dylan Losey   Sep. 2021 - Present

- Developed a method that can learn long horizon tasks from a single video demonstration from a human
- Developed a vision-based system for applications in meat processing
- Developed representation learning based method enabling robots to co-adapt alongside humans
- Developed a method that enables robots to influence humans and quickly adapt to new humans
- Developed a self-supervision based algorithm to learn latent mapping without human demonstrations for applications in assistive robots

Research Assistant *IIT Gandhinagar*

Advisor: Dr. Vineet Vashista   Jan. 2019 - May. 2021

- Developed a human-in-the-loop control modality for multiple quadcopters collaboratively transporting a cable-suspended payload
- Developed a quadcopter-payload experimental setup with a custom sensor suite for state feedback estimation
- Lead an investigative study to understand human-robot interaction in a shared control paradigm with a virtual quadcopter simulator

Publications

[1] **Sagar Parekh**, Lauren Bramblett, Nicola Bezzo, Dylan P. Losey. "Using high-level patterns to estimate how humans predict a robot will behave". In submission. [Link]

[2] Ananth Jonnavittula, **Sagar Parekh**, Dylan P Losey. "VIEW: Visual Imitation Learning with Waypoints." In submission. [Link]

[3] Ryan Wright*, **Sagar Parekh***, Robin White, and Dylan P. Losey. "Safely and autonomously cutting meat with a collaborative robot arm." Scientific Reposrt, 2024. [Link]

[4] **Sagar Parekh**, and Dylan P. Losey. "Learning Latent Representations to Co-Adapt to Humans." Autonomous Robots, 2023. [Link]

[5] **Sagar Parekh**, Soheil Habibian, and Dylan P. Losey. "RILI: Robustly influencing latent intent." IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022. [Link]

[6] Mehta, Shaunak A.*, **Sagar Parekh***, and Dylan P. Losey. "Learning latent actions without human demonstrations." IEEE International Conference on Robotics and Automation (ICRA), 2022. [Link]

[7] Prajapati, Pratik, **Sagar Parekh**, and Vineet Vashista. "On-board cable attitude measurement and controller for outdoor aerial transportation." Robotica, 2022. [Link]

[8] Prajapati, Pratik, **Sagar Parekh**, and Vineet Vashista. "On the human control of a multiple quadcopters with a cable-suspended payload system." IEEE International Conference on Robotics and Automation (ICRA), 2020. [Link]

[9] Prajapati, Pratik, **Sagar Parekh**, and Vineet Vashista. "Collaborative transportation of cable-suspended payload using two quadcopters with human in the loop." IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), 2019. [Link]

Technical Skills

Programming	Python, MATLAB, ROS, Arduino
Softwares	Unity3D, Unreal Engine
Interests	Reinforcement Learning, Robot Learning, Artificial Intelligence, Multi-Agent Systems
Robots	FrankaEmika Panda, Fetch, Universal Robots

Select Projects

Computer Vision and Deep Learning for Self-Driving Cars   *Virginia Tech*

Deep Learning Course Project   Jan. 2024 - May. 2024

- Designed Convolutional Autoencoder for feature extraction from on-board camera
- Implemented a transformer-based reinforcement learning method for autonomous driving
- Generated a policy for collision free driving with lane keeping

Quadcopter Simulator   *IIT Gandhinagar*

Senior Design Project   Jan. 2019 - May. 2021

- Developed a quadcopter simulator using the the game development software Unity3D
- Programmed the dynamics of a quadcopter as well as implemented an onboard assistive controller using C# script in Unity
- Designed a serial communication protocol to receive RC inputs from Arduino to Unity

Autonomous Quadcopter for Disaster Relief   *Nirma University*

IdeaLabs   Apr. 2018 - Mar. 2019

- Developed a prototype quadcopter with a mechanical gripper arm to deliver aid packets for disaster relief
- Designed and fabricated the mechanical gripper with a payload carrying capacity of 250 grams
- Programmed the Pixhawk controller to operate the gripper as well as autonomously navigate using GPS

Autonomous Navigation of a Mobile Robot   *Nirma University*

Course Project   Jan. 2018 - May. 2018

- Designed a mobile robot in Gazebo simulator in Robotic Operating System (ROS)
- Developed an autonomous navigation pipeline using Gmapping in ROS to map an unstructured environment and using Active Monte Carlo Localization (AMCL) for localisation in the map