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 Student Researcher *Virgina Tech*

Advisor: Dr. Dylan Losey Sep. 2021 - Present

- Working on a method to learn from multi-modal sensor data for applications in meat-processing
- Developed a method by combining representation learning with reinforcement learning to allow robots to co-adapt alongside human partner
- Developed a method that enable robots to influence its human partner and quickly adapt to new humans
- Developed a self-supervised method to learn latent mapping without human demonstrations

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
- Conducted indoor and outdoor experiments for validating the developed control modality
- Lead an investigative study to understand human-robot interaction in a shared control paradigm with a virtual quadcopter simulator

Publications

[1] **Sagar Parekh**, and Dylan P. Losey. "Learning Latent Representations to Co-Adapt to Humans." arXiv preprint arXiv:2212.09586 (2022). [Link]

[2] **Sagar Parekh**, Soheil Habibian, and Dylan P. Losey. "RILI: Robustly influencing latent intent." arXiv preprint arXiv:2203.12705 (2022). [Link]

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

[4] Prajapati, Pratik, **Sagar Parekh**, and Vineet Vashista. "On-board cable attitude measurement and controller for outdoor aerial transportation." Robotica 40.5 (2022): 1650-1664. [Link]

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

[6] Prajapati, Pratik, **Sagar Parekh**, and Vineet Vashista. "Collaborative transportation of cable-suspended payload using two quadcopters with human in the loop." 2019 28th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). IEEE, 2019. [Link]

Technical Skills

Programming	MATLAB, Python, Pytorch, OpenCV, ROS, Arduino
Softwares	Unity3D, Unreal Engine
Interests	Reinforcement Learning, Robot Learning, Learning from Demonstrations, Deep Learning
Robots	FrankaEmika Panda, Fetch, Universal Robots UR10

Select Projects

Research Assistant *IIT Gandhinagar*

Advisor: Dr. Vineet Vashista 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*

Advisor: Dr. Mihir Chauhan 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