Sagar Parekh

📞 (+1)919-501-1218 | ✉ sagarp@vt.edu | 🏠 https://sagarparekh97.github.io/ | 📍 Blacksburg, VA, USA | ⌨ GoogleScholar

Education

Virginia Tech *Blacksburg*
PhD in Robotics
Sep. 2021 - Present

Nirma University *Ahmedabad*
B. Tech. in Mechanical Engineering
Sep. 2015 - May. 2019

Research Experience

Graduate Research Assistant *Virgina Tech*
Advisor: Dr. Dylan Losey
Sep. 2021 - Present

- Created a theory of mind algorithm that models how humans understand robot behavior
- Developed a method that can learn long horizon tasks from a single video demonstration from a human
- Implemented a vision-based system for applications in meat processing
- Designed a 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
- Created a self-supervision based algorithm to learn latent mapping for applications in assistive robotics

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
- Designed and fabricated 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

Using high-level patterns to estimate how humans predict a robot will behave *In Submission*
SAGAR PAREKH, Lauren Bramblett, Nicola Bezzo, Dylan P. Losey
2024

VIEW: Visual Imitation Learning with Waypoints *In Submission*
Ananth Jonnavittula, *SAGAR PAREKH*, Dylan P Losey
2024

Safely and autonomously cutting meat with a collaborative robot arm *Scientific Reports*
Ryan Wright*, *SAGAR PAREKH**, Robin White, and Dylan P. Losey
2024

Learning latent representations to co-adapt to humans *Autonomous Robots*
SAGAR PAREKH, and Dylan P. Losey
2023

RILI: Robustly Influencing Latent Intent *IROS*
SAGAR PAREKH, Soheil Habibian, and Dylan P. Losey
2022

Learning latent actions without human demonstrations *ICRA*
Mehta, Shaunak A.*, *SAGAR PAREKH**, and Dylan P. Losey
2022

On-board cable attitude measurement and controller for outdoor aerial transportation *Robotica*
Prajapati, Pratik, *SAGAR PAREKH*, and Vineet Vashista
2022

On the human control of a multiple quadcopters with a cable-suspended payload system

Prajapati, Pratik, *SAGAR PAREKH*, and Vineet Vashista

Collaborative transportation of cable-suspended payload using two quadcopters with human in the loop

Prajapati, Pratik, *SAGAR PAREKH*, and Vineet Vashista

Technical Skills

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

Projects

Vision based Reinforcement Learning for Autonomous Cars

Virginia Tech

- Designed a 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

- Designed a simulated environment in Unity3D
- Designed a quadcopter model and programmed the 3 dimensional dynamics in the sim
- 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

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

Autonomous Navigation of a Mobile Robot

Nirma University

- 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