Sagar Parekh

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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

- Pioneered a meta learning based approach to balance datasets for improved imitation learning.
- Developed an adaptive robot policy combining representation learning with reinforcement learning for rapid co-adaptation to new humans.
- Designed a video-based imitation learning method that can learn long horizon tasks from a single video demonstration
- Implemented a discrete autoencoder for extracting explainable task-relevant behaviors from low level data.
- Formalized a method to learn structured latent mappings for complex robot actions without using human demonstrations
- Deployed vision-based system for high-precision meat-cutting with a collaborative arm.

Research Assistant — *IIT Gandhinagar*
Advisor: Dr. Vineet Vashista — Jan. 2019 - May. 2021

- Developed a human-in-the-loop control and learning framework for multi-quadcopter systems collaboratively transporting a cable-suspended payload.
- Built a custom quadcopter-payload hardware platform with onboard sensing and state-estimation pipelines.
- Created a simulated quadcopter environment to study shared autonomy and evaluate learned control strategies.

Publications

Fine-Tuning Robot Policies While Maintaining User Privacy — *Under Review*
Benjamin Christie, *SAGAR PAREKH*, Dylan P. Losey — 2025

Towards balanced behavior cloning from imbalanced datasets — *Under Review*
SAGAR PAREKH, Heramb Nemlekar, Dylan P. Losey — 2025

Safe and Transparent Robots for Human-in-the-Loop Meat Processing — *Under Review*
SAGAR PAREKH, Casey Grothoff, Ryan Wright, Robin White, Dylan P. Losey — 2025

Using high-level patterns to estimate how humans predict a robot will behave — *IROS*
SAGAR PAREKH, Lauren Bramblett, Nicola Bezzo, Dylan P. Losey — 2025

VIEW: Visual Imitation Learning with Waypoints — *Autonomous Robots*
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 *ICRA*

Prajapati, Pratik, *SAGAR PAREKH*, and Vineet Vashista 2020

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

Prajapati, Pratik, *SAGAR PAREKH*, and Vineet Vashista 2019

Technical Skills

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

Projects

Adaptive Robot Policy for Enhanced Human-Robot Interaction

Virginia Tech

- Leveraged GPT-4.0 to design and finetune reward models for robot policy.
- Implemented a reinforcement learning algorithm for learning adaptive robot policy.
- Enabled robots to achieve behaviors that synergize with different human partners.

Vision based Reinforcement Learning for Autonomous Cars

Virginia Tech

- Designed a Convolutional Autoencoder for extracting informative features from RGB-D images.
- Implemented a transformer-based Soft Actor-Critic policy for autonomous lane-keeping and collision avoidance.
- Trained end-to-end policies achieving stable autonomous navigation in simulation.

Quadcopter Simulator

IIT Gandhinagar

- Built a quadcopter simulator in Unity3D with full 3D dynamics and onboard sensing.
- Implemented assistive control policies using C and tested learned behaviors via hardware-in-the-loop integration with Arduino.
- Designed a communication pipeline for real-time RC command streaming.

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