

SIDDHARTH PATKI

About

I'm a Postdoctoral Researcher working in the Embodied AI group at FAIR, Meta. My research deals with building foundation models for enabling efficient human robot collaboration in everyday environments. I'm an experimental roboticist who enjoys working in fast paced teams and on deploying models on real robotic platforms.

Education

Ph.D in Electrical Engineering, University of Rochester, USA [2017 - 2023]

Dean's Fellow, Hajim School of Engineering | Advisor: Prof. Thomas Howard

M.S. in Electrical Engineering, University of Rochester, USA [2015 - 2017]

B.Tech. in Electronics Engineering, University of Pune, India [2009 - 2013]

Work Experience

Postdoctoral Researcher, Meta, CA [April 2023 - Now]

- Leading research on developing foundation models for task planning in human-robot collaboration context. Training LLMs to learn task decomposition, agent coordination, world models and theory of mind using simulated HITL data.
- Building a benchmark dataset with about 1000 multi-agent human-robot collaboration tasks grounded in realistic scenes using LLMs and Habitat 3.0 sim.

Applied Scientist, Amazon, CA [Oct 2022 - April 2023]

- Developed vision based damage detection model for a robotic arm deployed to filter damaged products passing on the packaging conveyor belts in AFCs.
- Designed annotation noise robust loss functions which boosted the model performance by ~5% helping the team meet their EOY goals. This enabled data collection at a larger scale by relaxing the dependency on expert annotators.

Graduate Research Assistant, University of Rochester [2017-2023]

- Conducted an arc of research on developing joint models of language and perception for efficient robot instruction following in cluttered dynamic spaces.
- Published 6+ peer-reviewed papers in top-tier robotics conferences and journals including ICRA, CoRL, IROS, RoMAN, SigDial and Field Robotics.
- 5+ years of hands on experience in developing 3D perception stacks for real world robot autonomy problems such as 3D object detection, 6DoF pose estimation, multi-object tracking, scene recognition, semantic segmentation, SLAM, sensor selection and calibration, custom dataset curation etc.
- 6+ years of programming experience with modern C++. Proficient with tools such as PyTorch, OpenCV, PCL, ROS, Catkin, Gazebo, NVIDIA Xavier, etc.

Select Publications

- Siddharth Patki et.al. "Language Guided Temporally Adaptive Perception for Efficient Natural Language Grounding in Cluttered Dynamic Worlds" 2023 *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*
- Siddharth Patki et.al. "Inferring Compact Representations for Efficient Natural Language Understanding of Robot Instructions" In *IEEE ICRA 2019*

Contact

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Links

[Personal Webpage](#)

[Google Scholar](#)

[H2SL](#)

[Github](#)

[RAIL](#)

Programming Skills

C++, Python, Matlab
PyTorch, OpenCV, PCL
ROS, CMake, Catkin

Robots and Sensors

Boston Dynamics Spot
Rethink Robotics Baxter
Universal Robotics UR5 arm
Clearpath Robotics Husky UGV
Intel Realsense 415, 435
Velodyne Lidar

Professional Service

Program Committee:
CoRL 2020

Reviewer:
RSS 2022, 2020, 2017
IROS 2019, 2023
ICRA 2019
ACL 2020
EACL 2020

Public Outreach:
Robotics demonstrator at the
Rochester Museum and Science
Center 2016, 2019, 2022

Teaching Assistant:
Introduction to C++
Digital Image Processing

- **Siddharth Patki**, E. Fahnestock, T.M. Howard, and M. Walter, "Language-guided Semantic Mapping and Mobile Manipulation in Partially Observable Environments," In *Conference on Robot Learning*. PMLR, Oct. 2019, vol. 100, pp. 1201-1210
- **Siddharth Patki** and T.M. Howard, "Language-guided Adaptive Perception for Efficient Grounded Communication with Robotic Manipulators in Cluttered Environments," In *19th Annual Meeting of the Special Interest Group on Discourse and Dialogue*. Jul. 2018
- Arkin, Jacob, **Siddharth Patki**, Joshua D. Rosser, and Thomas M. Howard. "An Efficient Algorithm for Visualization and Interpretation of Grounded Language Models." In *2022 31st IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, pp. 266-273. IEEE, 2022.
- Walter, Matthew R., **Siddharth Patki**, Andrea F. Daniele, Ethan Fahnestock, Felix Duvallet, Sachithra Hemachandra, Jean Oh, Anthony Stentz, Nicholas Roy, and Thomas M. Howard. "Language Understanding for Field and Service Robots in a Priori Unknown Environments." In *Field Robotics 2021*
- E. Fahnestock, **S. Patki**, and T.M. Howard, "Language-guided Adaptive Perception with Hierarchical Symbolic Representations for Mobile Manipulators," In *6th AAAI Fall Symposium Series on Artificial Intelligence for Human-Robot Interaction*. Nov. 2019
- A. Boteanu, J. Arkin, **S. Patki**, T.M. Howard, and H. Kress-Gazit, "Robot-Initiated Specification Repair through Grounded Language Interaction," In *AAAI Fall Symposium on Natural Communication for Human-Robot Collaboration*. Nov. 2017

Mentored Students

Ethan Fahnestock, Currently a PhD student at MIT

AUGUST 2018 – DECEMBER 2019

Nikola Raicevic, Currently a PhD student at UCSD

AUGUST 2021 – AUGUST 2022