SIDDHARTH PATKI

About

I am an experimental roboticist who is passionate about building 3D perception stacks for autonomous robots. My PhD research focuses on building adaptive models of perception for enabling efficient human-robot interaction in complex dynamic environments. My work at Amazon dealt with building efficient (high recall-low FPR) computer vision models for detecting product damage at scale.

Education

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

Dean's Fellow, Hajim School of Engineering, 2017-19 | Guide: Prof. Thomas Howard

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

Scholar, New York State Center of Excellence in Data Science, 2016

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

Work Experience

Applied Scientist, Amazon, USA [Oct 2022 - Jan 2023]

- Developed computer vision models for detecting damage across a million different product categories to achieve 82% Recall at 1% FPR performance.
- Analyzed and designed loss functions that are robust to annotation noise which boosted the model performance by ~5%. This also enabled data collection at a larger scale by relaxing the dependency on trained annotators.
- Experimented with transformer based video classification techniques such as MViTv2 for detecting robot induced product damage during bin packing tasks.

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

- Solid knowledge of deep learning and factor graph based techniques for developing joint models of language understanding and perception for efficient human robot-teaming in everyday dynamic spaces.
- Published 6+ peer-reviewed papers in top-tier robotics conferences and journals including ICRA, CoRL, 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

Patki et.al. "Language-guided Semantic Mapping and Mobile Manipulation in Partially Observable Environments" In CoRL 2019

Patki et.al. "Inferring Compact Representations for Efficient Natural Language Understanding of Robot Instructions" In *IEEE ICRA* 2019

Patki et.al. "Language-guided adaptive perception for efficient grounded communication with robotic manipulators in cluttered environments" SIGdial 2018

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

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
ICRA 2019
ACL 2020
EACL 2020

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

Teaching Assistance:
Introduction to C++
Digital Image Processing