

Omkar Patil

CS PhD @ ASU



About



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Robotics

Robot Learning

Generative Modeling

Compositional Learning

Natural Language Processing

Human-robot Interaction
Robustness

Summary

My aim is to add value to society by doing impactful research and innovation. I have a strong background in Machine Learning and Robotics from my Master's degree at IIT Madras. After graduation, I gained valuable work experience in NLP research at Wells Fargo. Currently, I have joined the PhD program at ASU and will be working in Dr. Nakul Gopalan's lab at ASU on robot learning.

Publications

Learning Factorized Diffusion Policies for Conditional Action Diffusion

05/2025

ICRA 2025 Workshop on Foundation Models and Neuro-Symbolic AI for Robotics | Omkar Patil, Eric Rosen, Nakul Gopalan

A novel method to compositionally learn diffusion policies with respect to different observational modalities, such as proprioception and vision.

Compositional Few-shot Learning of Motions

10/2024

Compositional Learning Workshop @ NeurIPS 2024 | Omkar Patil, Nakul Gopalan

A novel compositional approach called DSE- Diffusion Score Equilibrium that enables few-shot learning for novel skills by utilizing a combination of base policy priors is presented.

Hardware-Software Co-Design for Path Planning by Drones

10/2024

IROS 2024 | Ayushi Dube, Omkar Patil, Gian Singh, Nakul Gopalan, and Sarma Vrudhula

This work consists of designing a hardware-software co-design, MT+, for adapting the Mikami-Tabuchi (MT) algorithm for on-board path planning by drones in a 3D environment.

Learning Temporally Composable Task Segmentations with Language

10/2024

IROS 2024 | Divyanshu Raj, Omkar Patil, Weiwei Gu, Chitta Baral and Nakul Gopalan

We present an approach to identify sub-tasks within a demonstrated robot trajectory with the supervision provided by language instructions.

Understanding metrics for paraphrasing

05/2022

Arxiv | Omkar Patil, Rahul Singh, Tarun Joshi

We propose a novel metric ROUGE-P to measure the quality of paraphrases along the dimensions of adequacy, novelty and fluency.

Document automation architectures and technologies: A survey

09/2021

Arxiv | Mohammad Ahmadi Achachlouei, Omkar Patil, Tarun Joshi, Vijayan N Nair

This paper surveys the current state of the art in document automation in light of recent advances in artificial intelligence and deep neural networks.

Education

Arizona State University

08/2023 - 05/2028

Doctor of Philosophy Computer Science
3.9

- Planning/Learning Methods for AI
- Knowledge Representation and Reasoning

Indian Institute of Technology, Madras

07/2018 - 05/2020

Master of Technology Robotics and AI
8.22

- Deep Learning
- Reinforcement Learning

- Computational Heat & Fluid Flow
- Design of Machine Elements

Experience

Arizona State University

08/2023 - Present

Graduate Research Assistant

Research assistant in Dr. Nakul Gopalan's lab at Arizona State University.

Wells Fargo

10/2022 - 07/2023

Senior Quantitative Analytics Specialist

Member of the Artificial Intelligence and Automation team within Corporate Model Risk.

- Researched and implemented prompt-tuning on language models for generating different kinds of paraphrases for downstream applications such as robustness testing.
- Collaborated with other researchers within the team to develop methodologies for evaluating model weaknesses with a special focus on text classification models.

Wells Fargo

08/2020 - 10/2022

Quantitative Analytics Specialist

Member of the Artificial Intelligence and Automation team within Corporate Model Risk.

- Explored text generation for the task of paraphrasing and developed a new metric to evaluate the quality of paraphrases.
- Surveyed various document automation frameworks present in literature.
- Contributed significantly to the internal code library and made several presentations on research projects, across the group

Eaton

05/2018 - 07/2018

Research Intern

Survey research on amorphous metals in the Additive Manufacturing team.

- Performed extensive literature review to put forward Eaton products that could benefit from amorphous metals.
- Enhanced cold spray simulation capability by creating a Python script for the fluid dynamics part of the simulation

Institute WebOps and MobOps

04/2017 - 05/2018

Head

Lead of the official mobile development team of IIT Madras.

- Led a team of 9 students for the development of the 'Students App', managing a budget of ~INR 3L.
- Increased the number of active users by ~160%, to 6500+ students, with 12000+ downloads in total.
- Developed a sophisticated Java front-end and PHP back-end to build a secure and useful application on Android.
- Introduced innovative features such as a complaints portal, institute-attuned timetable, and calendar

Volunteer

Madhuvan Foundation

11/2019 - 12/2019

Intern

Non-governmental organization for the welfare of underprivileged children.

- Quickly ramped up with the current operations of reselling scrap newspaper and facilitating education for the needy with the obtained proceeds
- Streamlined the scrap collection under the 'Pasti Ki Pathshala' project by creating a database of participants willing to donate scrap newspaper
- Organized a collection drive at a local school for 800+ students to promote the idea of social welfare

Conferences

01/2023 - Present

Reviewer

Reviewer for IROS 2024, ICRA 2025, CORL 2025

