

Shivam Goel

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EDUCATION

Tufts University

Ph.D. Candidate in Computer Science

Advisors: Dr. Jivko Sinapov & Dr. Matthias Scheutz

Medford, MA

Jan 2020 – Present

Washington State University

Masters of Science in Computer Science

Advisor: Dr. Matthew E. Taylor

Pullman, WA

Aug 2015 – May 2017

Uttar Pradesh Technical University

Bachelors of Engineering in Information Technology

Noida, UP

Aug 2011 – June 2015

SELECTED PUBLICATIONS

Open-World Novelty Handling

2021 – Present

Novelty detection, adaptation, neurosymbolic reasoning

- **Shivam Goel**, Panagiotis Lymeropoulos, et al. [A Neurosymbolic Cognitive Architecture Framework for Handling Novelties in Open Worlds](#). AIJ, 2024.
- **Shivam Goel**, Yichen Wei, Panagiotis Lymeropoulos, et al. [NovelGym: A Flexible Ecosystem for Hybrid Planning and Learning](#). AAMAS, 2024.
- **Shivam Goel**, Yash Shukla, Vasanth Sarathy, Matthias Scheutz, Jivko Sinapov. [RAPid-Learn: A Framework for Learning to Recover for Handling Novelties in Open-World Environments](#). ICDL, 2022.

Generalizability in Robotic Skills (Sim2Real)

2023 – Present

Force-based skills, object-centric robot-agnostic learning, sim-to-real transfer

- **Shivam Goel**, Shijie Fang, Wenchang Gao, Matthias Scheutz, Jivko Sinapov. [FLEX: Robot-Agnostic Force-based Skills](#). ICRA, 2025.
- Yash Shukla, Bharat Kesari, **Shivam Goel**, et al. [Few-Shot Policy Transfer through Observation Mapping](#). IROS, 2023.

Applied Robotics: Agriculture & Healthcare

2017 – 2019

Computer vision, agricultural robotics, smart homes

- **Shivam Goel**, Santosh Bhusal, Matthew E Taylor, Manoj Karkee. [Detection and localization of birds for Bird Deterrence using UAS](#). ASABE, 2017.
- Garrett Wilson, Christopher Pereyda, **Shivam Goel**, et al. [Robot-enabled support of daily activities in smart homes](#). Cognitive Systems Research, 2019.

Full publication list available on [Google Scholar](#).

EXPERIENCE

Mulip Lab – Tufts University

Medford, MA

Researcher

Jan 2020 – Present

- Developed neurosymbolic AI techniques that improved sample efficiency and adaptability in robot learning.
- Led projects on open-world novelty handling and hybrid learning frameworks.
- Published in premier venues including ICRA, IROS, AAMAS, and AIJ.

HRI Lab – Tufts University

Medford, MA

Researcher

May 2023 – Present

- Designed on-the-fly adaptation strategies for robotic manipulation and autonomous driving domains.
- Integrated neurosymbolic methods in DIARC Cognitive Architecture to enable adaptive decision-making in dynamic environments.

IRL Lab – Washington State University

Pullman, WA

Researcher

Oct 2016 – Dec 2019

- Built computer vision systems for agricultural robotics applications.

- Developed UAV-based bird deterrence systems and contributed to automated fruit harvesting research.
- Co-authored journal and conference papers in agricultural technology and AI for robotics.

CASAS Lab – Washington State University

Researcher

Pullman, WA

Jan 2018 – Dec 2019

- Developed smart home AI for elder care, focusing on daily activity support.
- Published in healthcare and cognitive systems venues.

Center of AI for Social Good – University of Southern California

Research Intern

Los Angeles, CA

Apr 2018 – Dec 2018

- Applied AI to wildlife conservation, developing UAV-based thermal vision methods for poacher detection.
- Increased detection accuracy from 30% to 68% through novel computer vision models.

ACTIVE PROJECTS

Generalizable Robotic Skills | Physics-based Learning, Object-centric RL

- Develop advanced motion primitives (e.g., twisting) to enable transferable robot skills across tasks and platforms.

Scalable Frameworks for General-Purpose Robots | Neurosymbolic AI, General-purpose Robotics

- Leverage hybrid neurosymbolic architectures to integrate force-based robot-agnostic skills into larger robotic platforms capable of broad generalization.

Reasoning for Open-World Adaptation | Novelty Handling, Affordances discovery

- Incorporate symbolic reasoning to guide skill learning when encountering novel objects and their affordances.

TECHNICAL DEMONSTRATIONS

Tufts Robotics Open House | 2024, 2025

- Showcased neurosymbolic robotic learning systems for novelty handling to cross-disciplinary audience.

MassRobotics | Boston, 2023

- Demonstrated VR-based interaction capabilities of a turtlebot

Tufts Graduate Showcase | 2022

- Presented multimodal robotic interaction systems to cross-disciplinary audiences.

SKILLS

Programming: Python, Java, C++, R, MATLAB

Frameworks: Robot Operating Systems (ROS), Robosuite, CARLA

Deep Learning frameworks: PyTorch, Tensorflow

Developer Tools: Linux, Git, Docker, VS Code, IntelliJ

Simulations: Pybullet, Gazebo, Mujoco

Relevant Coursework: Reinforcement Learning, Probabilistic Robotics for HRI, Machine Learning, Artificial Intelligence, Introduction to Robotics, Operating Systems, Pervasive Computing, Robot Kinematics and Dynamics.

SERVICE & OUTREACH

2026 : AAAI-26, ICRA-26, AIJ reviewer

2025 : IROS-25, ICAPS-25 Reviewer, AIJ reviewer

2024 : ICAPS-24, IEEE-ICDL, IEEE Transactions on Control Systems Technologies reviewer

2022 : AAMAS-22 reviewer

2022 : Co-organizer & Program Committee at 2nd IJCAI Workshop on Artificial Intelligence for Autonomous Driving (AI4AD).

2020 : Initiated and organized bi-weekly RL reading group at Tufts SAIL-ON program.

2019: RL Reading Group Coordinator at WSU

2016, 2017: IRL Lab bi-weekly seminar coordinator at WSU

2018, 2019: Volunteered as a photographer at the Eastern Washington Aspirations in Computing Award Ceremony and Banquet.