Rashmeet Kaur **Nayyar**

rashmeetnayyar@gmail.com, rmnayyar@asu.edu | rashmeetnayyar.com | Rashmeet09 | rashmeetnayyar

Research Interests

Transfer and Generalization, Hierarchical Reinforcement Learning (HRL), Learning Abstractions, Option discovery, Autonomous Decision-making.

Education

Ph.D. in Computer Science, Arizona State University, Tempe, US *Spring 2025*
Advisor: Prof. Siddharth Srivastava | *Thesis*: Learning Abstractions for Transfer and Generalization in HRL *GPA 3.94/4.0*

B.E. in Information Technology, Pune Institute of Computer Technology, Pune, India *Spring 2017*
Advisor: Prof. Shyam Deshmukh | *Capstone*: Content-based auto-tagging of audios using deep learning *GPA 3.51/4.0*

Research & Professional Experience

Autonomous Agents & Intelligent Robots lab, SCAI, Arizona State University *Tempe, USA*
Graduate Research Assistant *Aug. 2019 - (present)*

- Researching automatic synthesis of abstractions for generalization in RL [P6].
- Formulated and developed an innovative dynamic abstraction learning approach, outperforming SOTA RL [P4].
- Collaboratively crafted an AI system to educate non-experts in robot planning [P5].
- Proposed a novel method for learning true functionality of adaptive black-box AI agents to ensure safety [P2].

STARs lab, School of Earth & Space Exploration, Arizona State University *Tempe, USA*
Graduate Student Assistant *Aug. 2018 - Aug. 2019*

- Developed an AI system to reliably infer intergalactic space properties using First-order Open-Universe Probabilistic logic. Analyzed Hubble Space Telescope's Cosmic Origins Spectrograph UV Spectra.

LinkedIn Corporation *Tempe, USA*
AI ML Engineer Intern *May 2022 - Aug 2022*

- Investigated an Offline Reinforcement Learning framework for Task-oriented Dialogue Agents.

Bank of New York Mellon Technology *Pune, India*
Application Developer *June 2017 - June 2018*

- Completely rebuilt DORA application on NEXEN cloud platform using Java, AngularJS, & Kanban agile methodology.

Publications

Conferences

P6. Rashmeet Kaur Nayyar, Shivanshu Verma, and Siddharth Srivastava. "Learning Transferable Options with Composable Representations for Reinforcement Learning in Factored Domains". (In submission)

P5. Daksh Dobhal*, Jayesh Nagpal*, Pulkit Verma, Rushang Karia, **Rashmeet Kaur Nayyar**, Naman Shah, and Siddharth Srivastava. "Using Explainable AI and Hierarchical Planning for Outreach with Robot". (In submission)

P4. Mehdi Dadvar, **Rashmeet Kaur Nayyar**, and Siddharth Srivastava. "Conditional Abstraction Trees for Sample-efficient Reinforcement Learning". In 39th Conference on Uncertainty in Artificial Intelligence, 2023.

P3. Rushang Karia, **Rashmeet Kaur Nayyar**, and Siddharth Srivastava. "Learning Generalized Policy Automata for Relational Stochastic Shortest Path Problems". In *36th Conference on Neural Information Processing Systems*, 2022.

P2. Rashmeet Kaur Nayyar*, Pulkit Verma*, and Siddharth Srivastava. "Differential Assessment of Black-Box AI Agents". In *36th AAAI Conference on Artificial Intelligence*, 2022. * Joint first authors

P1. Rashmeet Kaur Nayyar et. al. "Content-based auto-tagging of audios using deep learning". In *IEEE International Conference on Big Data, IoT, and Data Science (BID)*, 2017.

Workshops

W1. Rashmeet Kaur Nayyar, Shivanshu Verma, and Siddharth Srivastava. "Learning Generalizable Symbolic Options for Transfer in Reinforcement Learning". In *7th Workshop on Generalization in Planning, NeurIPS*, 2023. (In submission)

Academic Projects

Learning multi-level hierarchies with hindsight

CSE 598 | Deep Learning | ASU

- Implemented Levy et al., 2017 in PyTorch to build hierarchical autonomous agents using Open AI Gym environments.

Vision-based Manipulator movement with Fetch

CSE 591 | Perception in Robotics | ASU

- Implemented a visual-feedback based method to guide the Fetch mobile manipulator's end-effector to reach the target object without using AR-markers. Presentation

Restraining Bolts in the real world

CSE 574 | Planning and learning in AI | ASU

- Developed a framework for imposing constraints on an AI agent in a world with noisy observations in Python. Poster

Card Shuffling using Markov chains

CSE 591 | Markov Chain Monte Carlo | ASU

- Analyzed Overhand, Top-to-random, Knuth, Transposition, Thorp, and Riffle card shuffling techniques. Presentation

Teaching Experience

Graduate Teaching Assistant (CSE 471), Graduate Student Assistant (CSE 463)

Tempe, USA

Arizona State University

Fall 2021, Fall 2018

- Co-designed engaging ROS programming assignments & assessments for CSE471: Intro to AI.
- Led interactive hands-on tutorials: Search, Planning, MDPs, RL, Statistical Learning, Probabilistic Inference. Supported 92 students with weekly office hours. Crafted effective grading rubrics for homework & assignments.
- Assessed assignments & exams for a class of 150 students in CSE463: Introduction to Human-Computer Interaction.

Instructor - Artificial Intelligence

Tempe, USA

Clubes De Ciencia Arizona Summer Program

June 2020

- Empowered 25 high-school students with AI's core essentials & made it easily digestible through hands-on sessions: Search, Planning, & Reinforcement Learning.

Press

[1] American Astronomical Society awards ASU students Chambliss medals Karin Valentine, ASU NOW, May 2020.

[2] Rashmeet Kaur Nayyar receives Chambliss medal from American Astronomical Society Erik Wirtanen, ASU Inner Circle, June 2020.

Service

2023 **PC Member**, NeurIPS AAAI AAMAS ICLR LEAP at CoRL GenPlan at NeurIPS
2022 **PC Member**, AAAI XAIP at ICAPS GenPlan at IJCAI
2022 **GPSA Travel Grants Reviewer**, Graduate and Professional Student Association,

Awards & Grants

2023 **SCAI Conference Funding and Graduate College Travel Award**, ASU (for NeurIPS)
2023 **GPSA Travel Grant**, ASU (for NeurIPS)
2022 **SCAI Conference Funding and Graduate College Travel Award**, ASU (for NeurIPS)
2022 **GPSA Travel Grant**, ASU (for AAAI)
2021 **Graduate College Travel Awards**, ASU (for UAI, IJCAI, ICAPS)
2020 **Summer School on Automated Planning & Scheduling**, ICAPS
2019 **Grace Hopper Scholarship**, GHC
2019 **Chambliss Student Academic Achievement** , 234th American Astronomical Society (AAS) [Among 6 graduate winners worldwide]