Rashmeet Kaur Nayyar

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Research Interests

Learning Abstractions for Transfer and Generalization in Reinforcement Learning (RL), Long-horizon Planning under Uncertainty, Autonomous Sequential Decision-making, Robotics.

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 RL　　*GPA 3.96/4.0*

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 [C6, W1].
- Formulated and developed an innovative dynamic abstraction learning approach, outperforming SOTA RL [C4].
- Collaboratively crafted an AI system to educate non-experts in robot planning [C5].
- Proposed a novel method for learning true functionality of adaptive black-box AI agents to ensure safety [C2].

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

C6. Rashmeet Kaur Nayyar, Shivanshu Verma, Siddharth Srivastava. "Learning Transferable Options with Composable Representations for Reinforcement Learning in Factored Domains". (In submission)

C5. 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)

C4. Mehdi Dadvar, **Rashmeet Kaur Nayyar**, Siddharth Srivastava. "Conditional Abstraction Trees for Sample-efficient Reinforcement Learning". In 39th Conference on Uncertainty in Artificial Intelligence (UAI), 2023. ⧉ (**selected for oral**)

C3. Rushang Karia, **Rashmeet Kaur Nayyar**, Siddharth Srivastava. "Learning Generalized Policy Automata for Relational Stochastic Shortest Path Problems". In *36th Conference on Neural Information Processing Systems (NeurIPS)*, 2022. ⧉

C2. Rashmeet Kaur Nayyar*, Pulkit Verma*, Siddharth Srivastava. "Differential Assessment of Black-Box AI Agents". In *36th AAAI Conference on Artificial Intelligence (AAAI)*, 2022. ⧉ *Joint first authors

C1. 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, Siddharth Srivastava. "Learning Generalizable Symbolic Options for Transfer in Reinforcement Learning". In *7th Workshop on Generalization in Planning (GenPlan), NeurIPS*, 2023. ⧉

Project Experience

Integration of Fetch Robot with Motion Capture System
Robotics | ASU
- Performed manipulation on Fetch through integration with OptiTrak motion capture system using reflective markers.

Learning multi-level hierarchies with hindsight
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
Perception in Robotics | ASU | Presentation ⊠
- Guided Fetch's end-effector to target objects using visual feedback without AR markers.

Restraining Bolts in the real world
Planning and learning in AI | ASU | Poster ⊠
- Developed a framework for imposing constraints on an AI agent in a world with noisy observations in Python.

Card Shuffling using Markov chains
Markov Chain Monte Carlo | ASU | Presentation ⊠
- Analyzed Overhand, Top-to-random, Knuth, Transposition, Thorp, and Riffle card shuffling techniques.

Teaching Experience

Graduate Teaching Assistant (CSE 471), Graduate Student Assistant (CSE 463)
Tempe, USA
Arizona State University
Fall 2021, Fall 2018
- Led hands-on tutorials and co-designed ROS programming assignments in AI. Supported 92 students with weekly office hours & crafted grading rubrics & assessed assignments & exams for 250 students across AI & HCI courses.

Instructor - Artificial Intelligence
Tempe, USA
Course ⊠ | Clubes De Ciencia Arizona Summer Program
June 2020
- Taught 25 high school students core AI concepts including Search, Planning, & RL through hands-on learning sessions.

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]

Skills

Proficient in Python, PyTorch, Robot Operating System (ROS), C++, C. Familiar with TensorFlow.