Rashmeet Kaur **Nayyar**

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Research Interests

Generalized Learning and Planning, Open-Universe Partially Observable Markov Decision Processes, Hierarchical Reinforcement Learning, Analysis of Abstractions, and AI Safety in Artificial Intelligence (AI).

Education

Ph.D. in Computer Science, Arizona State University, Tempe, US *Spring 2024*
Advisor: Prof. Siddharth Srivastava *GPA 3.97/4.0*

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*

Publications

Conferences

Mehdi Dadvar, **Rashmeet Kaur Nayyar**, and Siddharth Srivastava. "Learning Dynamic Abstract Representations for Sample-Efficient Reinforcement Learning". (In submission)

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.

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

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

Rushang Karia*, **Rashmeet Kaur Nayyar***, and Siddharth Srivastava. "Learning Generalized Policy Automata for Relational Stochastic Shortest Path Problems". In *6th workshop on Generalization in Planning, IJCAI*, 2022. *Equal Contribution

Rashmeet Kaur Nayyar*, Pulkit Verma*, and Siddharth Srivastava. "Differential Assessment of Black-Box AI Agents". In *SafeAI - AAAI's Workshop on Artificial Intelligence Safety*, 2022. *Equal Contribution

Research Experience

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

- Researching AI principles to build efficient systems that can reason, plan, & act reliably & safely in the uncertain world.
- Proposed a novel method to automatically learn abstractions that significantly outperform existing methods.
- Learning automatic synthesis of generalized abstract machines or controllers for efficient Reinforcement Learning.
- Investigating optimal parameter synthesis for speeding up learning of BSQ policies for Open-Universe POMDPs.
- Proposed a novel method to learn the true functionality of black-box AI agents whose models may change due to adaptation to dynamic environments. Our approach differentially assesses such agents to ensure their safe usage.

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

- Developed an automated AI system to reliably infer properties of intergalactic space using First-order Open-Universe Probabilistic logic in collaboration with Prof. Sanchayeeta Borthakur.
- Analyzed UV Spectra obtained from the Cosmic Origins Spectrograph aboard the Hubble Space Telescope.

Awards

Rashmeet Kaur Nayyar, Mansi Padave, Sanchayeeta Borthakur, and Siddharth Srivastava. Won the prestigious Chambliss Student Academic Achievement award at the *234th summer meeting of the American Astronomical Society (AAS)*, 2019 among 6 graduate medal winners and hundreds of participants worldwide. Poster

Teaching Experience

Graduate Teaching Assistant (CSE 471) — *Tempe, USA*
Arizona State University — *Fall 2021*

- Responsible for co-designing programming assignments in Robot Operating System (ROS), homeworks, & exams for CSE471: Introduction to Artificial Intelligence.
- Created & delivered hands-on tutorial sessions on topics: Search, Planning, Markov Decision Processes (MDPs), Reinforcement Learning (RL), Statistical Learning, and Probabilistic Inference for a class of 92. Also conducted office hours each week and created rubric for grading homeworks and assignments.

Instructor - Artificial Intelligence — *Tempe, USA*
Clubes De Ciencia Arizona Summer Program — *June 2020*

- Taught fundamentals of AI (Problem Solving by Search, Classical Planning, and Reinforcement Learning) and conducted practical sessions to introduce the concepts to 25 high-school students in an easily comprehensible manner.

Graduate Student Assistant (CSE 463) — *Tempe, USA*
Arizona State University — *Aug. 2021 - Dec. 2021*

- Responsible for grading assignments and exams for CSE463: Introduction to Human-Computer Interaction for a class of about 150 students.

Professional Experience

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

- Investigated and proposed a framework for Offline Reinforcement Learning for Task-oriented Dialogue Agents.

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

- Rewrote DORA application from scratch on NEXEN cloud-based platform (using Java, AngularJS, Jasmine, Karma, Maven, Grunt, Jenkins, and Kanban agile methodology).

Innobytes Technologies Pvt. Ltd. — *Pune, India*
Research Project Intern — *Sep. 2016 - Jan. 2017*

- Tackled the problem of inaccurate prediction of tags for audios in MagnaTagATune dataset.
- Achieved 0.866 AUC-ROC score through CNN & CRNN deep neural networks (Keras, Tensorflow).

Press

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

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

Service

2023 **PC Member**, AAAI 2023
2022 **PC Member**, ICAPS 2022 Workshop on Explainable AI Planning (XAIP'22)
2022 **PC Member**, IJCAI 2022 Workshop on Generalization in Planning (GenPlan'22)
2022 **GPSA Travel Grants Reviewer**, Graduate and Professional Student Association,

Grants

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