Amirhossein Rajabpour

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Headline

Bridging ML research and engineering • Machine Learning, Reinforcement Learning, Generalization

Education

- **University of Alberta** 2023 – 2025
  M.Sc. in Computing Science, advised by Levi Lelis & Sandra Zilles Edmonton, AB, Canada
  GPA: 3.8/4
  Research Topics: Reinforcement Learning, Deep Learning, Program Synthesis
- **Amirkabir University of Technology (Tehran Polytechnic)** 2018 – 2023
  B.Sc. in Computer Engineering (Major: AI, Minor: Computer Networks) Tehran, Iran
  GPA (last two years): 3.96/4

Publications

- *Common Benchmarks Undervalue the Generalization Power of Programmatic Policies.*
  - **A. Rajabpour**, K. Aghakasiri, S. Zilles, L. Lelis. (Under review at **NeurIPS 2025**; accepted at the **RLC 2025 Programmatic RL Workshop**). [Preprint] [Code] [Page]

Technical Skills

- **Programming:** Python, C, Java, Kotlin, Octave
- **ML/AI:** PyTorch, TensorFlow, Keras, scikit-learn, fastai, OpenCV
- **Data/DB:** MySQL, PostgreSQL, MongoDB
- **Web:** Django, Flask, HTML, CSS
- **Tools/OS:** Git, Docker, Jira, Selenium, XAMPP, Linux, Windows, macOS

Professional and Research Experience

- **Research Assistant**, University of Alberta May 2024 – Jul 2025
  - Refined neural policies (RL agents) through targeted architectural and training adjustments, enabling them to match or outperform programmatic policies in generalization on key benchmarks.
  - Proposed new benchmarks highlighting strengths of programmatic policies (e.g., memory-based reasoning).
  - Built end-to-end training/evaluation pipelines (Python, Bash, PyTorch, TensorFlow).
  - Used **Large Language Models** to generate/assess interpretable policies where RL underperforms.
  - Work under review at **NeurIPS** Position Track 2025 and accepted at RLC 2025 Programmatic RL workshop.
- **Technical Advisor**, Alberta Machine Intelligence Institute (Amii) Sep 2024 – Oct 2024
  - 1-month project on advanced AI/ML methods to enhance real-time intrusion detection and anomaly detection in high-speed network storage infrastructures.
  - Focused on threat-detection accuracy and scalability in multi-cloud settings.
- **Machine Learning Engineer**, R&D Dept., Crouse PJS Co. Oct 2021 – Jan 2022
  - Designed lightweight industrial ML for detecting malfunctioning LEDs: localization (OpenCV), fuzzy C-means clustering of light pixels, luminance/wavelength extraction, and per-color regression modeling.
- **DevOps Engineer Intern**, Graph Co. Nov 2020 – Apr 2021
  - Hands-on experience with Docker and cloud-native tooling.

Additional Research Projects

- **Individual Study Course Project**, University of Alberta Jan 2023 – Apr 2024
  - Implemented hill climbing (with exploration) and a genetic algorithm to improve "Unveiling Options with Neural Decomposition". Supervisor: Levi Lelis.
- **Reinforcement Learning 1 Course Project**, University of Alberta Sep 2023 – Dec 2023
  - Compared generalization of expert (concentrates resources on a single task) vs. generalist (splits resources across tasks) agents (PPO, DQN, APPO) across MiniGrid and budget regimes. [Project Report & Code]
- **Bachelor's Thesis: Face Aging Platform**, Amirkabir University Mar 2023 – May 2023
  - Developed a face-aging platform using generative models (e.g., CycleGAN, reversible models). Supervisor: Mohammad Rahmati. [Code]
  - Integrated multiple pretrained models with distinct dependencies into a unified system using Docker Compose, deploying each in separate containers and orchestrating communication across them.

- **Research Assistant: Portfolio Allocation with RL & GNNs** , Amirkabir University Feb 2022 – Jun 2022
  – Implemented a graph convolutional network over time-series for asset allocation. Supervisor: Hamed Farbeh.

Teaching Assistant

- **University of Alberta**
  - CMPUT 366: Search & Planning in AI | Instructor: Levi Lelis Fall 2024, Winter 2025
  - CMPUT 291: Intro to File & Database Management | Instructors: Davood Rafiei, Arash Nobari Fall 2023, Winter 2024
- **Amirkabir University of Technology**
  - Principles of AI | Instructor: Mahdi Javanmardi Fall 2022
  - Cloud Computing | Instructor: S. Ahmad Javadi Fall 2022
  - Internet of Things | Instructor: Siavash Khorsandi Fall 2022
  - Algorithm Design | Instructors: A. Bagheri, S. Shirali–Shahreza Winter 2022, Fall 2021, Winter 2021

Honors and Awards

- Master's admissions: Fully funded offers from UAlberta (CS, ECE, Radiology & Diagnostic Imaging) & Western Ontario (CS) 2023
- Bachelor's Scholarship: 4-year scholarship, Amirkabir University of Technology 2019–2023
- Nationwide Mathematics University Entrance Exam (Iran): Top 1% among 140,000+ applicants 2018

Graduate Courses

- Reinforcement Learning 1 (Marlos Machado)
- Reinforcement Learning 2 (Rich Sutton)
- Modelling Strategic Behavior (James Wright)
- Machine Learning (Lili Mou)

Language Skills

- Persian: Native
- English: TOEFL iBT 109 (R 26, L 28, S 26, W 29)
- German: Professional Working Proficiency (B2)

For more projects and information, please visit my GitHub or homepage: amirhossein-rajabpour.github.io