

Amin Rakhsha

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RESEARCH INTERESTS	Machine Learning, Reinforcement Learning, Multi-model Planning, Long-horizon Planning	
EDUCATION	University of Toronto	
	Ph.D. in Computer Science	Sep. 2020 - present
	- Supervisor: Prof. Amir-massoud Farahmand	
	Sharif University of Technology	
EXPERIENCES	B.Sc. in Computer Engineering	Sep. 2020
	- GPA: 19.52/20, ranked 2 nd among 111 students admitted in 2016	
	University of Toronto and Vector Institute , Toronto, Canada	
	Research Assistant, Supervisor: Prof. Amir-massoud Farahmand	Sep. 2020 - present
	- Working on Model-Based Reinforcement Learning.	
	Max Planck Institute for Software Systems (MPI-SWS) , Saarbrücken, Germany	
	Research Intern, Supervisor: Prof. Adish Singla	Jul. - Sep. 2019
	- Formulated the problem of adversarial attacks in reinforcement learning (RL).	
	- Inspected the problem of poisoning rewards in online and offline RL settings.	
	Chinese University of Hong Kong (CUHK) , Hong Kong	
	Research Intern	Jul. - Aug. 2018
	- Worked on improving the optimization algorithm used for distributionally robust logistic regression under the supervision of Prof. Anthony Man-Cho So (in a team of three students).	
	- Analyzed randomness extraction from generalized Santha-Vazirani sources with infinite possible distributions under the supervision of Prof. Andrej Bogdanov (in a team of three students).	
	Rahnema , Tehran, Iran	
	Software Engineering Intern	Jul. - Aug. 2017
	- Worked on a minimal location-based social network. Participated in the development of the iOS and Android applications as well as the back-end.	
HONORS AND AWARDS	Awards	
	• Ray Reiter Graduate Award In Computer Science (1000 CAD)	Jan. 2023
	• Borealis AI Global Fellowship (10,000 CAD)	May 2022
	• Ray Reiter Graduate Award In Computer Science (1000 CAD)	Dec. 2021
	• Computer Science 50th Anniversary Graduate Scholarship (2000 CAD)	Dec. 2020
	• Iran's National Elite Foundation Fellowship	2015 - 2020
	Competitions and Olympiads	
	• Silver Medal in International Mathematical Olympiad (IMO) [link]	Jul. 2016
	• Gold Medal in Iran National Mathematical Olympiad	Sep. 2015
	• Silver Medal in International Mathematics Competition (IMC) [link]	Jul. 2014
PUBLICATIONS	• Champion Team in International Mathematics Competition (IMC) [link]	Jul. 2014
	• Lee, J. [†] , <u>Rakhsha, A.</u> , Ryu E., and Farahmand, A.m. PID Accelerated Temporal Difference Algorithms. <i>Preprint</i> , 2024 [pdf]	
	• Bedaywi, M.* [†] , <u>Rakhsha, A.*</u> , and Farahmand, A.m. PID Accelerated Temporal Difference Algorithms. In <i>Reinforcement Learning Conference 1 (RLC)</i> , 2024 [pdf]	

- Rakhsha, A., Kemertas, M., Ghaavamzadeh, M., and Farahmand, A.m. Maximum Entropy Model Correction in Reinforcement Learning. In *International Conference on Learning Representations 12 (ICLR)*, 2024 [pdf]
- Rakhsha, A., Wang, A.[†], Ghavamzadeh, M., and Farahmand, A.m. Operator Splitting Value Iteration. In *Advances in Neural Information Processing Systems 36 (NeurIPS)*, 2022 [pdf]
- Rakhsha, A.^{*}, Zhang, X.^{*}, Zhu, X., and Singla, A. Reward poisoning in reinforcement learning: Attacks against unknown learners in unknown environments. In *NeurIPS Workshop on Learning and Decision-Making with Strategic Feedback (StratML)*, 2021 [pdf]
- Rakhsha, A., Radanovic, G., Devidze, R., Zhu, X., and Singla, A. Policy teaching in reinforcement learning via environment poisoning attacks. In *Journal of Machine Learning Research (JMLR)*, 22(210):1–45, 2021 [pdf]
- Rakhsha, A., Radanovic, G., Devidze, R., Zhu, X., and Singla, A. Policy teaching via environment poisoning: training-time adversarial attacks against reinforcement Learning. In *International Conference on Machine Learning 37 (ICML)*, 2020. [pdf]

* Equal Contribution † Mentored Undergraduate/Master's Student Intern

TEACHING EXPERIENCE

Introduction to Artificial Intelligence, (multiple instructors) Winter 2021 - Winter 2024
Instructed tutorial classes. Held assignment help sessions. Graded exams.

Design of Algorithms, Instructor: Prof. Mohammad Ali Abam Fall 2019
Instructed the discussion classes. Designed assignments. Graded exams.

Linear Algebra, Instructor: Prof. Abolfazl Motahari Fall 2018
Designed the syllabus. Designed and graded assignments.

Data Structures and Algorithms, Instructor: Prof. Mohammad Ghodsi Fall 2018
Designed and graded assignments.

Probability and Statistics, Instructor: Prof. Abolfazl Motahari Fall 2017
Instructed the discussion classes. Created reading materials. Designed and graded assignments.

MENTORSHIP EXPERIENCE

- Mark Bedaywi Jan. 2023 - Mar. 2024
Mentored Mark Bedaywi, an undergraduate student at the University of Toronto, for his research experience course CSC494. The project led to an RLC 2024 publication.
- Jongmin Lee May. 2023 - Sep. 2023
Mentored Jongmin Lee, a master's student in math at Seoul National University, for his summer research internship at Vector Institute.
- Andrew Wang Nov. 2021 - Jun. 2022
Mentored Andrew Wang, an undergraduate student at the University of Toronto, for his research internship. The project led to a NeurIPS 2022 publication.

OTHER EXPERIENCES

Conference Paper Reviewing

Served as a reviewer in ICML (4 instances), NeurIPS (4 instances), and ICLR (2 instances).

Data Days Machine Learning and Data Science Competition Dec. 2018
Designed the tasks and judged contestants' results and methods as a member of the scientific staff.

SharifWorks Job-Finder Website Oct. - Dec. 2018
Developed a job-finding website using Django as a course project with two other students.

An Analysis of Globally Famous People Mar. - Jul. 2018
Studied 13 000 globally famous people using multiple datasets as well as crawling Wikipedia. Proposed the project for university Data Analysis course, tied for first place among 70+ students.

Field Introduction Seminar Series (FieldIn) Jan. 2018
Directed a staff of 16 as co-head of the execution team.

Sina Neurosurgical Assist

Aug. 2014

Developed an Android application to assist certain brain surgical procedures. The app has been used in various publications by different authors.

TECHNICAL SKILLS

- General Programing Skills:
 - Proficient: Java, R, Python
 - Intermediate: C, Git
- Machine Learning: PyTorch, Deep Reinforcement Learning
- Android and iOS Application Development: React-Native
- Website Development: Django, Node.js