

# Amin Rakhsha

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## RESEARCH INTERESTS

Machine Learning, Reinforcement Learning

## EDUCATION

**University of Toronto**, Toronto, Canada

Ph.D. in Computer Science

Sep. 2020 - Expected Nov. 2025

- Supervisor: Prof. Amir-massoud Farahmand

**Sharif University of Technology**, Tehran, Iran

B.Sc. in Computer Engineering

Sep. 2016 - Sep. 2020

- GPA: 19.52/20, ranked 2<sup>nd</sup> among 111 students admitted in 2016

**Iranian Young Scholars Club**, Tehran, Iran

National Mathematical Olympiad Gold Medalists Education Period

Oct. 2015 - Jul. 2016

- Qualified for Iran's six-person team in International Mathematical Olympiad (IMO).

**Allameh Helli High School**, Affiliated with National Organization for Development of Exceptional Talents (NODET), Tehran, Iran

Diploma in Mathematics and Physics

Sep. 2012 - May 2016

- Diploma GPA: 19.97/20, ranked 1<sup>st</sup> among 300+ students

## PUBLICATIONS

- [Rakhsha, A., Wang, A., Ghavamzadeh, M., and Farahmand, A. Operator Splitting Value Iteration. In \*Advances in Neural Information Processing Systems 35 \(NeurIPS\)\*, 2022](#)
- [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. \*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 \*Proceedings of the 37th International Conference on Machine Learning \(ICML\)\*, 2020. \[\\[pdf\\]\]\(#\)](#)

## RESEARCH EXPERIENCE

**Max Planck Institute for Software Systems (MPI-SWS)**, Saarbrücken, Germany

Research Intern Under the Supervision of 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

Funded Summer Research Program Participant

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).

## HONORS AND AWARDS

- Borealis AI 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
- 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
- Champion Team in International Mathematics Competition (IMC) [\[link\]](#) Jul. 2014

TEACHING  
EXPERIENCE

- **Introduction to Artificial Intelligence** Fall 2021 - Fall 2022  
CSC384 - University of Toronto
- **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.

OTHER  
EXPERIENCES

**Conference Paper Reviewing**

Served as a reviewer in ICML'21, NeurIPS'21, ICLR'22, ICML'22, NeurIPS'22 conferences.

**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.

**Rahnema Co.**

Jul. - Aug. 2017

As a software developer intern, worked on a minimal location-based social network. Participated in the development of the iOS and Android applications as well as the back-end.

**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

- Machine Learning: Some experience with PyTorch and TensorFlow
- General Skills:
  - Advanced: Java, R, Python
  - Intermediate: C, C++, Git, L<sup>A</sup>T<sub>E</sub>X
- Android and iOS Application Development: React-Native
- Website Development: Django, Node.js