

# Matin Aghaei

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## RESEARCH INTERESTS

- Deep Reinforcement Learning
- Optimization for Machine Learning
- Quantitative Trading
- Robotics
- Multi-Agent Systems

## EDUCATION

*Master of Science, Computer Science* Sep. 2022 – Present  
Simon Fraser University, Burnaby

*Bachelor of Science, Computer Engineering* Sep. 2017 – Apr. 2022  
Amirkabir University of Technology, Tehran

*Diploma, Mathematics and Physics* Sep. 2014 – Jun. 2017  
National Organization for Development of Exceptional Talents, Karaj

## RESEARCH EXPERIENCE

*Graduate Research Assistant* Jan. 2023 – Present  
Research Topic: Convergence Guarantees for Policy Gradient Algorithms  
Supervisor: Prof. Vaswani  
Simon Fraser University, Burnaby

*Undergraduate Research Assistant* March. 2021 – Apr. 2022  
Research Topic: Portfolio Management using Reinforcement Learning Algorithms  
Supervisor: Prof. Ebadzadeh  
Amirkabir University of Technology, Tehran

## PUBLICATIONS

“On the Convergence Rates of Log-Linear Policy Gradient Methods” [PDF], **Matin Aghaei**, Anderson de Andrade, Qiushi Lin, Sharan Vaswani. In preparation.

“Practical Principled Policy Optimization for Finite MDPs” [PDF], Michael Lu, **Matin Aghaei**, Anant Raj, Sharan Vaswani. “Optimization for Machine Learning” workshop, NeurIPS, 2023 (**Oral Presentation**).

## SELECTED COURSE PROJECTS

### *Computer Vision*

- Designed and trained CNN models to perform Object Detection, Semantic Segmentation, and Instance Segmentation on the iSAID dataset.[code]

### *Robotics*

- A robot controller which follows oval and spiral paths [code]
- A robot controller which constructs an obstacle map using VFH algorithm and avoids the obstacles in a Gazebo environment using a polar histogram [code]

### *Data Mining*

- An image compressor (Using K-Means algorithm to reduce the number of colors in an image by clustering them) [code]

### *Information Retrieval*

- A search engine for Persian language using inverted index and TF-IDF [code]

### *Principles of Computational Intelligence*

- A 2-layer Neural Network [code]
- Genetic Algorithm for solving Knapsack [code] and Traveling Salesman [code] problems
- Fuzzy C-means Clustering [code]

### *Principles and Applications of Artificial Intelligence*

- Natural Language Processing using n-grams [code]
- Genetic Algorithm & Simulated Annealing Algorithm for solving Constraint Satisfaction Problem [code]
- A\*, Bi-directional and IDS algorithms for solving Rubik's Cube [code]
- AC-3 algorithm for solving Constraint Satisfaction Problem [code]

## **WORK EXPERIENCE**

*Teaching Assistant, Probability and Computing* Jan. 2024 – Present  
Instructor: Prof. Vaswani, Simon Fraser University, Burnaby

*Teaching Assistant, Data Structures and Algorithms* Jan. 2023 – Apr. 2023  
Instructor: Mohammad Jahanara, Simon Fraser University, Burnaby

- Helped students with the assignments

*Teaching Assistant, Introduction to Artificial Intelligence* Sep. 2022 – Dec. 2022  
Instructor: Prof. Imran, Simon Fraser University, Burnaby

- Designed novel programming problems
- Helped students with the assignments

*Head Teaching Assistant, Artificial Intelligence* Sep. 2021 – Jul. 2022  
Instructor: Prof. Javanmardi, Amirkabir University of Technology, Tehran

- Created tutorial videos about RL and Bayes nets
- Designed assignments & projects
- Helped students with the assignments
- Supervised 8 other teaching assistants

*Head Teaching Assistant, Computational Intelligence* Sep. 2020 – Jan. 2022  
Instructor: Prof. Ebadzadeh, Amirkabir University of Technology, Tehran

- Designed assignments & quizzes
- Helped students with the assignments
- Supervised 7 other teaching assistants

*Teaching Assistant, Operating Systems* Sep. 2020 – Jan. 2022  
Instructor: Prof. Zarandi, Amirkabir University of Technology, Tehran

- Designed assignments
- Created problem-solving content for students
- Helped students with the assignments

*Head Teaching Assistant, Data Mining* Feb. 2021 – Jun. 2021  
Instructor: Prof. Nazerfard, Amirkabir University of Technology, Tehran

- Designed assignments & projects
- Helped students with the assignments
- Supervised 7 other teaching assistants

*Educational Manager* Mar. 2019 – Sep. 2020  
Students' Scientific Chapter of Computer Engineering  
Amirkabir University of Technology, Tehran

- Elected by students of the department
- Organized extracurricular courses and presentations
- Cooperated in holding programming contests

## HONORS & AWARDS

- Paper accepted for an oral presentation (**top-5% contribution**) in NeurIPS OPT Workshop, 2023
- Ranked **top 2%** among more than 150,000 Iranian students in the National University Entrance exam in Engineering and Applied Mathematics, 2017
- Advanced to the 3<sup>rd</sup> stage of the Iranian National Olympiad in Informatics (**Only 80 students** reached this stage), 2015
- Qualified as a member of the National Organization for Development of Exceptional Talents, 2010

## SKILLS

- *Programming Languages:* Python, Java, C, C++, MATLAB, SQL, JavaScript
- *Frameworks & Libraries:* Numpy, Scipy, TensorFlow, PyTorch
- *Development tools:* Git, VS Code, Visual Studio, PyCharm, IntelliJ, Vivado

## LANGUAGES

- *Persian:* Native
- *English:* Advanced

## REFERENCES

- Sharan Vaswani  
Assistant Professor in the School of Computing Science  
Simon Fraser University, Burnaby  
Email: sharan\_vaswani@sfu.ca
- Mohammad Mehdi Ebadzadeh  
Professor and Head of the Computer Engineering Dept.  
Amirkabir University of Technology, Tehran  
Email: ebadzadeh@aut.ac.ir
- Hamid Reza Zarandi  
Associate Professor in the Computer Engineering Dept.  
Amirkabir University of Technology, Tehran  
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- Mahdi Javanmardi  
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