

SEYED MOHAMMAD SADEGH MAHDAVI

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EDUCATION

University of British Columbia

Ph.D. in Electrical and Computer Engineering

2023– 2027

M.A.Sc. in Electrical and Computer Engineering

2021 – 2023

Supervisors: Renjie Liao and Christos Thrampoulidis

Sharif University of Technology

2017 – 2021

B.Sc. in Computer Engineering, GPA: 19.07/20.00

PUBLICATIONS

1. **Sadegh Mahdavi**, Renjie Liao, and Christos Thrampoulidis. Memorization capacity of multi-head attention in transformers. *International Conference on Learning Representations (ICLR)*, 2024 (**Spotlight**)
2. **Sadegh Mahdavi**, Renjie Liao, and Christos Thrampoulidis. Revisiting the equivalence of in-context learning and gradient descent: The impact of data distribution. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2024
3. **Sadegh Mahdavi**, Kevin Swersky, Thomas Kipf, Milad Hashemi, Christos Thrampoulidis, and Renjie Liao. Towards better out-of-distribution generalization of neural algorithmic reasoning tasks. *Transactions on Machine Learning Research (TMLR)*, 2023

RESEARCH EXPERIENCE

Borealis AI

Jan. 2024 – Present

Machine Learning Research Intern

- Conducting research at the intersection of Large Language Models and Causality.

University of British Columbia

Sept. 2021 – Present

Research Assistant, Supervised by Prof. Liao and Prof. Thrampoulidis

- Investigating the out-of-distribution generalization capabilities of graph neural networks and Transformers.
- Examining the in-context learning abilities of the Transformer architecture.

Sharif University of Technology

Mar. 2020 – Jul. 2020

Research Assistant, Machine Learning Lab

- Leveraged image registration techniques to enhance the few-shot medical image segmentation accuracy.
- Achieved a 2% improvement in Dice scores, demonstrating the effectiveness of the proposed approach.

AWARDS AND HONORS

- UBC Four Year Doctoral Fellowship (4YF) 2023
- Silver Medal in 58th **International Mathematical Olympiad**, Rio de Janeiro, Brazil 2017
- Silver award in XXIX Asian Pacific Mathematics Olympiad 2017
- Gold Medal at 28th Iran National Mathematics Olympiad, Tehran, Iran 2016

TECHNICAL EXPERIENCE

CafeBazaar

Aug. 2018 – Oct. 2019

Software Engineer (Part-time)

Worked as a Back-End software engineer at Divar product, the leading classified ads service in Iran with more than 20 million users.

TEACHING EXPERIENCE

University of British Columbia

- CPEN355 (Machine Learning with Engineering Applications) Fall 2023
- CPEN400D (Deep Learning) Winter 2022
- ELEC400M (Machine Learning Fundamentals for Engineers) Winter 2021, Fall 2022

VOLUNTEER EXPERIENCE

- Served as the scientific lead of Sharif AI Challenge 2020, an annual AI contest held at Sharif University of Technology.

SELECTED COURSES

- Deep Learning with Structures *
- Graphical Models & Causal Inference*
- Deep Reinforcement Learning*
- Measure Theory and Integration*
- High-Dimensional Probability*
- Convex Optimization*
- Computer Vision
- Information and Coding Theory*
- Probability and Statistics
- Linear Algebra
- Algorithm Design
- Game Theory
- Advanced Information Retrieval

* indicates a graduate course

SKILLS

General	\LaTeX
Languages and Tools	C, Python, Docker, Kubernetes.
Web Development	Django web framework.
Machine Learning	PyTorch, JAX.

LANGUAGES

Persian	Native
English	Fluent (TOEFL: 104)
Arabic	Reading knowledge