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# Hamed Mahdavi

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## EDUCATION

### Ph.D. Computer Science and Engineering

Jan 2022 - Jul 2026

*Pennsylvania State University  
State College, PA*

Supervisors: Prof. Mehrdad Mahdavi, Prof. Vasant Honavar

Thesis: To be determined

Main courses: Large-scale Machine Learning, Markov Chain Monte Carlo Methods, Numerical Solutions of ODEs

### M.Sc. Artificial Intelligence

Sep 2017 - Dec 2020

*Sharif University of Technology  
Tehran, Iran*

Supervisor: Prof. Hamid Beygi

Thesis: Approximate Inference in Probabilistic Network Models

Main courses: Stochastic Processes, Speech Processing, Probabilistic Graphical Models, Advanced Statistical Machine Learning, Convex Optimization

### B.Sc. Computer Engineering

Sep 2012 - Sep 2017

*Sharif University of Technology  
Tehran, Iran*

Supervisor: Prof. Hossein Sameti

Thesis: A Survey On Speech Enhancement Algorithms

Main courses: Signal and Systems, Design and Analysis of Algorithms, Advanced Programming with Java, Agile Software Development

## SKILLS

<b>Programming</b>	Python, Java, C, C#, Scala, Git, L <sup>A</sup> T <sub>E</sub> X, Matlab,
<b>ML Tools</b>	PyTorch, PyTorch Geometric, scikit-learn, NumPy, SciPy, Pandas,
<b>Development Tools</b>	Python Django, Play Framework, SQL, Bootstrap
<b>Communication</b>	English (fluent)
<b>Other</b>	Github, Microsoft Office

## PROFESSIONAL AND ACADEMIC EXPERIENCE

### Research Assistant

Jan 2022 - Present

*Pennsylvania State University*

*State College, PA*

- Collaborating with Prof. Mahdavi and Prof. Honavar to develop machine learning models that generalize well on molecules that contain rare elements or combinations.
- Developing graph neural network models specific for molecules using PyTorch Geometric library.

### Data-scientist Intern

Jun 2023 - Aug 2023

*Arconic Technology Center*

*New Kensington, PA*

- I worked in the Fabrication Technology group under the supervision of Martin Marinack. I tackled several data-driven optimization problems during my internship to enhance and optimize Arconic's fabrication processes such as welding, rolling, and casting.

**Teaching Assistant***Pennsylvania State University***Jan 2022 - Present***State College, PA*

- Taught the recitation classes for Discrete Math and Introduction to Computation Theory, Data Structures and Algorithms.
- Collaborated in grading assignments and exams for Discrete Math and Introduction to Computation Theory.

**Research Assistant***Sharif University of Technology***Sep 2017 - Dec 2020***Tehran, Iran*

- Collaborated with Prof. Hamid Beygi to develop a new graph neural network model that is able to learn meaningful representations of social media networks.
- Studied and implemented probabilistic machine learning models of social networks and their combinations with recent graph neural network-based models.

**Research Collaborator***Sharif University of Technology***Dec 2019 - Feb 2019***Tehran, Iran*

- Collaborated with Naemeh Omidvar and Prof. Maddahali to develop a new approach in distributed optimization that combines zeroth-order and first-order gradients to optimize the communication rate.
- Applied Ray framework and PyTorch to implement our proposed algorithm and other baselines. These technical tools were necessary to compare the performance of algorithms in the real distributed setting on several remote machines.

**Research Intern***Max Planck Institute for Software Systems***Aug 2018 - Jan 2019***Saarbrücken, Germany*

- Worked on fundamental aspects of reinforcement learning. Our main focus was on multi-agent, adversarial and human-centered reinforcement learning.
- Studied the problem of designing an AI agent that can robustly cooperate with agents of unknown type. The project was inspired by real-world applications in which an AI agent, e.g., a virtual assistant, has to cooperate with new types of agents/users after its deployment.

**Software Engineer Intern***Faragostar***Jul 2017 - Sep 2017***Tehran, Iran*

- Developed a compression algorithm that allowed Faragostar to save all of their official documentation while minimizing the storage space needed.
- Configured the infrastructure for a search engine tool known as Elasticsearch, which allowed for more efficient and complex searches to be performed in their app when compared to the simple SQL query search tool that it replaced.

**Mathematical Olympiad Grader***Young Scholars Club***Jun 2013 - Jul 2013***Tehran, Iran*

- As a Mathematical Olympiad Grader, I was responsible for grading the student answers for the second round of Iranian National Mathematical Olympiad and Iranian Geometry Olympiad.

**Mathematical Olympiad Teacher***Allameh Helli Highschool***Oct 2012 - Apr 2013***Tehran, Iran*

- Allameh Helli is a school for the academically gifted and, as a Mathematical Olympiad Teacher, I was responsible for teaching Number Theory.

## PUBLICATIONS

- A. Ghosh, S. Tschischek, H. Mahdavi, and A. Singla, “Towards Deployment of Robust AI Agents for Human-Machine Partnerships,” In *AAMAS*, 2020.
- Naeimeh Omidvar, Mohammad Ali Maddah-Ali, Hamed Mahdavi: “A Hybrid-Order Distributed SGD Method for Non-Convex Optimization to Balance Communication Overhead, Computational Complexity, and Convergence Rate”, 2020; arXiv:2003.12423.