

Hafez Ghaemi

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Areas of interest: Self-supervised learning - neural networks - theoretical neuroscience - reinforcement learning

Education

Ph.D. | Computer Science Aug. 2023 – Aug 2027
Mila Quebec - University of Montreal Montreal, Canada

- Advisors: Eilif Muller, Ph.D., Shahab Bakhtiari, Ph.D

M.Sc. | Computer Engineering, AI and Robotics Sep. 2020 – August 2023
University of Tehran,

GPA: 18.0/20.0, North American: 3.72/4.0 Tehran, Iran

- Thesis: Cumulative Prospect Theory in Multi-Agent Reinforcement Learning and Markov Games.
Advisors: Hamed Kebriaei, Ph.D., Majid Nili, Ph.D

M.Sc. | Data Science and Engineering (Program taught in English) Sep. 2020 – July 2022
Politecnico di Torino,

GPA: 26.3/30.0 (103/110), North American: 3.7/4.0 Turin, Italy

- Thesis: Decentralized Value-Based Reinforcement Learning in Stochastic Potential Games ([link](#))
Advisors: Fabio Fagnani, Ph.D., Giacomo Como, Ph.D

B.Sc. | Major: Mechanical Engineering, Minor: Computer Engineering Sep. 2016 – Sep. 2020
University of Tehran,

Overall GPA: 16.24/20.0 (3.35/4.0), Major: 16.24 (3.3), Minor: 16.26 (3.4) Tehran, Iran

- Thesis: Design and Implementation of a Smart Camera Slider Controller Using Deep Reinforcement Learning ([code](#))
Advisor: Masoud Shariat Panahi, Ph.D

Publications

- Hafez Ghaemi*, Erfan Mirzaei*, and Mahbod Nouri*, BioLCNet: Reward-modulated Locally Connected Spiking Neural Networks. Machine Learning, Optimization, and Data Science: 8th International Workshop, LOD 2022, Certosa di Pontignano, Italy, September 19–22, 2022, Revised Selected Papers, Part II. Cham: Springer Nature Switzerland, 2023. *: equal contribution. ([DOI](#)), ([arXiv](#)) ([code](#))
- Mahbod Nouri*, Faraz Moradi*, Hafez Ghaemi*, Ali Motie Nasrabadi, Towards real-world BCI: CCSPNet, a compact subject-independent motor imagery framework, Digital Signal Processing, 2022, 103816, ISSN 1051-2004. *: equal contribution. ([DOI](#)), ([arXiv](#)), ([code](#))

Conferences

- The 8th International Conference on Machine Learning, Optimization, and Data Science, September 2022, Siena, Italy ([link](#)).
- The 2nd Advanced Course and Symposium on Artificial Intelligence and Neuroscience, September 2022, Siena, Italy ([link](#)).

Experience

Research Assistant	August 2023 – Present
Architectures of Biological Learning Lab (ABL), University of Montreal	Montreal, Canada
<ul style="list-style-type: none">• Located at CHU Sainte-Justine Research Centre• Principal investigator: <u>Eilif Muller, Ph.D</u>	
Teaching Assistant	July 2023
Computational Neuroscience Course, <u>Neuromatch Academy</u> , <u>Certificate</u>	
Graduate Teaching Assistant	February 2023 – July 2023
School of ECE, University of Tehran	Tehran, Iran
<ul style="list-style-type: none">• Neural Networks Course, instructor: <u>Ahmad Kalhor, Ph.D</u>• Game Theory Course, instructor: <u>Hamed Kebriaei, Ph.D</u>	
Research Assistant	October 2022 – Present
Cognitive Systems Lab, and Smart Networks Lab, School of ECE, University of Tehran	Tehran, Iran
<ul style="list-style-type: none">• Principal investigators: <u>Hamed Kebriaei, Ph.D</u>, <u>Majid Nili, Ph.D</u>	
Undergraduate Research Assistant	November 2019 – August 2020
Artificial Intelligence in Mechanical Engineering Lab, University of Tehran	Tehran, Iran
<ul style="list-style-type: none">• Member of the project team developing a mobile application that monitors human neck posture using front camera input and head pose estimation.• Principal investigator: <u>Masoud Shariat Panahi, Ph.D</u>	
Summer Intern	July 2019 – September 2019
Biorobotics Lab, School of Mechanical Engineering, University of Tehran	Tehran, Iran
<ul style="list-style-type: none">• Programming educational robots, design of dynamic mechanisms using CAD	
Undergraduate Teaching Assistant	September 2019 – January 2020
Materials Science Course, School of Mechanical Engineering, University of Tehran	Tehran, Iran
<ul style="list-style-type: none">• Lecturing, solving extra problems, grading homework• Instructor: <u>Ghader Faraji, Ph.D</u>	

Skills

Languages: English (fluent), Persian (native), French (Intermediate), Italian (basic), Arabic (basic)
Programming (ordered by decreasing proficiency): Python, MATLAB, C/C++, SQL, MongoDB, Julia, R, Java
Machine learning frameworks (ordered by decreasing proficiency): PyTorch, Scikit-Learn, Keras, Tensorflow
Miscellaneous: Linux, Git, Raspberry Pie, Arduino, Simulink, SolidWorks

Awards

Ranked 10 in the 25th Iranian Scientific Olympiad for University Students in Computer Engineering <u>news</u>	Feb. 2021
<u>TOPolito Scholarship</u>	Oct. 2020 - Sep. 2022
Awarded to Politecnico di Torino's top international students	
Iran's National Elites Foundation Membership	Sep. 2016
Awarded for excellent performance in the Iranian University Entrance Exam	

Certificates

Graduate Record Examinations (GRE): Q: 170, V: 162, W: 4.00 (<u>link</u>) Educational Testing Service (ETS)	November 2019
IELTS Academic: R: 9.0, L: 8.0, W: 7.0, S: 7.0 (<u>link</u>) International English Language Testing System	October 2021

Selected Academic Projects

Distributed Cooperative Multi-Agent Reinforcement-Learning in Markov Games (code) Python	Fall 2022
Distributed Learning and Optimization Course, University of Tehran	
Gossip Training for Image Classification with Deep Learning (code) Python	Fall 2022
Distributed Learning and Optimization Course, University of Tehran	
Federated Deep Learning for Image Classification (code) Python	Fall 2022
Distributed Learning and Optimization Course, University of Tehran	
Auditory Attention Task EEG Signal Classifier (code) Python	Spring 2022
Fifth BCI Competition of Iranian National Brain Mapping Laboratory (NBML)	
Fine-tuning BERT for Multi-lingual Hate Speech Detection and Text Classification (code) Python	Fall 2021
Deep Natural Language Processing Course, Politecnico di Torino	
A Hybrid Rule-based/Q-learning Hanabi Agent (code) Python	Fall 2021
Computational Intelligence Course, Politecnico di Torino	
Problems on Flow Optimization, Markov Chains, and Epidemic Models (code) Python	Fall 2021
Network Dynamics and Learning Course, Politecnico di Torino	
Music Genre Classification using CRNN and Transfer Learning (code) PyTorch	Spring 2021
Machine Learning and Deep Learning Course, Politecnico di Torino	
Comparison of ML methods for Facial and Emotional Recognition on JAFFE dataset (code) Python	Spring 2021
Mathematics in Machine Learning Course, Politecnico di Torino	
Applications of Krylov methods, PCA, and SVD in real-world problems (code) Python	Spring 2021
Computational Linear Algebra Course, Politecnico di Torino	
Stock Portfolio Management Using Deep Q-Learning (code) Python	Fall 2020
Reinforcement Learning Course, University of Tehran	

Personal Interests

Podcasts, traveling, classic novels, psychological thrillers and hard sci-fis, philosophy, chess