Hafez Ghaemi ⓘD

hafez.ghaemi@umontreal.ca
hafez.ghaemi@mila.quebec
hafezgh.github.io

Last updated: October 13, 2023

Areas of interest: Self-supervised learning - deep learning - reinforcement learning - theoretical neuroscience - embodied AI

Education

Ph.D.	Computer Science	Aug. 2023 – Present
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), (preprint) (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), (preprint), (code)

Preprints

- Aurora Saibene, Hafez Ghaemi, and Eda Dagdevir. "Deep Learning in Motor Imagery Eeg Signal Decoding: A Systematic Review." Available at SSRN 4592138. (DOI), (preprint)

Workshop and Conference Attendance

- Advances in NeuroAI Workshop, October 2023, Mila, Montreal, QC, Canada (link).
- 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
- Located at CHU Sainte-Justine Research Center
- Principal investigator: Eilif Muller, Ph.D

Research Assistant — August 2023 – Present
Systems Neuroscience and AI Lab (SNAIL), University of Montreal — Montreal, Canada
- Principal investigator: Shahab Bakhtiari, Ph.D

Teaching Assistant — July 2023
Computational Neuroscience Course, Neuromatch Academy, Certificate

Graduate Teaching Assistant — February 2023 – July 2023
School of ECE, University of Tehran — Tehran, Iran
- Neural Networks Course, instructor: Ahmad Kalhor, Ph.D
- Game Theory Course, instructor: Hamed Kebriaei, Ph.D

Research Assistant — October 2022 – August 2023
Cognitive Systems Lab, and Smart Networks Lab, School of ECE, University of Tehran — Tehran, Iran
- Principal investigators: Hamed Kebriaei, Ph.D, Majid Nili, Ph.D

Undergraduate Research Assistant — November 2019 – August 2020
Artificial Intelligence in Mechanical Engineering Lab, University of Tehran — Tehran, Iran
- Member of the project team developing a mobile application that monitors human neck posture using front camera input and head pose estimation.
- Principal investigator: Masoud Shariat Panahi, Ph.D

Summer Intern — July 2019 – September 2019
Biorobotics Lab, School of Mechanical Engineering, University of Tehran — Tehran, Iran
- 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
- Lecturing, solving extra problems, grading homework
- Instructor: Ghader Faraji, Ph.D

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 — Feb. 2021
news

TOPolito Scholarship — 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 (link)   November 2019
Educational Testing Service (ETS)

IELTS Academic: R: 9.0, L: 8.0, W: 7.0, S: 7.0 (link)   October 2021
International English Language Testing System

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