Hafez Ghaemi

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Areas of interest: Reinforcement learning - multi-agent learning and optimization - game theory - deep learning - computational neuroscience

Education

M.Sc. | ***Computer Engineering, AI and Robotics*** Sep. 2020 – July 2023
University of Tehran,
Current GPA: 18.5/20.0, North American: 3.75/4.0 Tehran, Iran

- **Thesis**: Risk Sensitivity and 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

- 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. (DOI), (arXiv), (code)
- **Hafez Ghaemi**, Erfan Mirzaei, and Mahbod Nouri, "BioLCNet: Reward-modulated Locally Connected Spiking Neural Networks." International Conference on Machine Learning, Optimization, and Data Science. Springer, Cham, 2022 (**In Press**). (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 October 2022 – Present
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), Arabic (basic), Italian (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
Other soft and hard skills: 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

Reinforcement Learning Specialization (link) October 2021
Coursera, University of Alberta & Alberta Machine Intelligence Institute

Deep Learning Specialization (link) May 2021
Coursera

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

Relevant Courses

- Machine Learning and Deep Learning (Graduate): 4/4
- Mathematics in Machine Learning (Graduate): 4/4
- Network Dynamics and Learning (Graduate): 4/4
- Reinforcement Learning (Graduate): 4/4
- Introduction to Cognitive Science (Graduate): 4/4
- Deep Natural Language Processing (Graduate): 4/4
- Big Data (Graduate): 4/4

- Computational Linear Algebra (Graduate): 4/4
- Game Theory (Graduate): 4/4
- Information Theory (Graduate): 3/4
- Artificial Intelligence (Undergraduate): 4/4
- Advance Programming (Undergraduate): 4/4
- Optimization of Mechanical Systems (Undergraduate): 4/4
- Numerical Computation (Undergraduate): 4/4
- Engineering Mathematics (Undergraduate): 4/4
- Computational Neuroscience (Graduate): Audit

Selected Academic Projects

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

Stock Portfolio Management Using Deep Q-Learning (code) | ***PyTorch*** Spring 2020
Reinforcement Learning Course, University of Tehran

Applications of Krylov methods, PCA, and SVD in real-world problems (code) | ***Python*** Fall 2021
Computational Linear Algebra Course, Politecnico di Torino

Waterfilling Power Allocation and LZSS Lossless Compression (code) | ***MATLAB*** Fall 2021
Information Theory Course, Politecnico di Torino

Object-oriented Design and Implementation of a Basic E-commerce Website (code) | ***C++*** Fall 2019
Advanced Programming Course, University of Tehran

Personal Interests

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