Curriculum Vitae

Mohaddeseh Mozaffari

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EDUCATION

M.Sc. Statistical Physics and Complex Systems, Shahid Beheshti University, Tehran, Iran   *Sep 2022 – Mar 2025*
GPA: 18.5/20 (~4.00/4.00 WES, **Second Rank**)

B.Sc. Physics, Shahid Beheshti University, Tehran, Iran   *Sep 2018 – May 2022*
GPA: 17.3/20 (~3.63/4.00 WES, **First Rank**)

RESEARCH INTERESTS

- Bio-Physics
- Brain Network Analysis
- Machine Learning
- Computional Neuroscience
- Network Neuroscience
- Artificial Intelligence

RESEARCH EXPERIENCE

Coevolutionary and Structural Balance Network Analysis and Classification of ADHD Using the Open-Source ADHD-400 Dataset, Center for Complex Networks (CCNet), Tehran, Iran   *Jul 2025 – Present*
Advisor: Prof. Reza Jafari

- Collaborated on the application of stuctural and Coevolutionary balance theory on brain networks.
- Engineered balance-theoretic features for group-level differentiation.
- Trained machine learning models to classify ADHD vs. control subjects.
- Contributed to drafting, editing, and reviewing the manuscript for publication.

Master's Thesis – Analysis of Topological Features of Brain Networks in the Autism Spectrum Disorder and Control Group Using Persistent Homology, Shahid Beheshti University, Tehran, Iran   *Jan 2024 – Present*
Advisor: Prof. Reza Jafari

- Applied topological data analysis (TDA) and persistent homology on fMRI data.
- Developed a node-removal-based approach to detect differences in topological features.
- Investigated age-related differences in brain network topology.
- Trained machine learning models to classify study groups.
- Developed a private Python package, `NeuroPHorm`, to automate the full TDA workflow.

PUBLICATIONS

Journal Articles

- Mohammadi, M.S., Shahrokhi, S., **Mozaffari, M.** *et al.* Nonlinear optical response of IMIP ionic liquid-stabilized magnetic graphene oxide sheets. *Journal of Materials Science: Materials in Electronics*, 33, 13224–13233 (2022). DOI:10.1007/s10854-022-08262-1

Conference Papers

- Yousefzadeh, M., Shirzadeh Barough, S., Fakharifar, A., **Mozaffari, M.**, *et al.* Automated Noninvasive FFR Estimation from Biplane Coronary Angiography Using a Transformer-Based Deep Learning Framework. *The Second National Meeting on Artificial Intelligence in Medical Imaging* (Oral Presentation), Rajaee Heart Institute, Tehran, Iran, June 11–13, 2025.

Manuscripts in Preparation

- **Mozaffari, M.**, Roshandel, S., Jafari, G.R. Persistent Homology Reveals Topological Alterations in Resting-State Brain Networks of Autism Spectrum Disorder.
- Yousefzadeh, M., Shirzadeh Barough, S., Fakharifar, A., Tayyarazad, Y., Eghbali, N., **Mozaffari, M.**, *et al.* Coronary Artery Segmentation and Vessel-Type Classification in X-Ray Angiography: Machine-Learning Generalized Image Processing and Deep Neural Networks.

SKILLS

Computing

- Python (Advanced)
- C++ (Intermediate)
- Git (Intermediate)
- Bash/Linux (Intermediate)
- Adobe Illustrator (Advanced)
- Adobe Photoshop (Intermediate)
- HTML/CSS (Elementary)
- LaTeX (Advanced)
- Microsoft Office Suite: Word, Excel, PowerPoint (Advanced)

Languages

- Persian (Native)
- English (Fluent)

TEACHING EXPERIENCE

Teaching Assistant, Department of Physics, Shahid Beheshti University

- Complex Systems Physics *(Jan 2025 – Jul 2025)*
- Complex Networks and Graph Theory *(Jan 2025 – Jul 2025)*
- Stochastic Processes *(Jan 2024 – Jul 2024)*
- Foundations of Numerical Simulations *(Sep 2023 – Jan 2024)*
- Complex Systems Physics *(Sep 2023 – Jan 2024)*
- Analytical Mechanics *(Sep 2022 – Jan 2023)*

WORK EXPERIENCE

Python Instructor, Ostadbank, Tehran, Iran   *Jul 2024 – Present*

- Deliver tailored Python lessons on OOP, ML, and AI to diverse learners.
- Guide students in mini-projects using NumPy, pandas, Matplotlib, seaborn, scikit-learn, and PyTorch.

Python Instructor, Picha Club, Tehran, Iran   *Jun 2023 – Present*

- Teach Python fundamentals, algorithms, and OOP to pre-teens and teens.
- Support students in building Tkinter apps and Pygame games.

INVITED TALKS

Statistical Physics and Complex Systems, Yasouj University, Yasouj, Iran   *Apr 2025*

- Introduced undergraduate physics students to complex systems in an invited online Persian talk (Recording available).

CERTIFICATIONS

- Deep Learning (Python) for Neuroscience EEG Practical Course — Udemy, Instructor: Ildar Rakhmatulin *(Aug 2025)* (Certificate)
- Machine Learning Specialization — Coursera / Stanford Online, Instructor: Andrew Ng *(Sep 2023)* (Certificate)
- Neural Networks and Deep Learning — DeepLearning.AI / Coursera, Instructor: Andrew Ng *(Aug 2022)* (Certificate)

WORKSHOPS, SCHOOLS, AND CONFERENCES ATTENDED

- fMRI Image Processing With CONN Toolbox — Shahid Beheshti University, Tehran, Iran *(Nov 2024)*
- The School of Evolutionary Dynamics of Cells and Viruses — School of Biological Sciences, IPM, Tehran, Iran *(Dec 2023)*
- The 28th Special School on Topics in Physics — Institute for Advanced Studies in Basic Science, Zanjan, Iran *(Jul 2023)*

REFERENCES

- **Reza Jafari**, Professor of Physics, Department of Physics and Institute for Cognitive Science and Brian, Shahid Beheshti University, Tehran, Iran.
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