

Mohaddeseh Mozaffari

✉ mohaddeseh.mozaffarii@gmail.com [in](#) MohiMozaffari [GitHub](#) MohiMozaffari [Globe](#) Personal Website

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
- Computational Neuroscience
- Network Neuroscience
- Artificial Intelligence

RESEARCH EXPERIENCE

Coevolutionary and Structural Balance Network Analysis and Classification of ADHD Using the Open-Source ADHD-400 Dataset *Jul 2025 – Present*

Center for Complex Networks (CCNet), Tehran, Iran

Advisor: [Prof. Reza Jafari](#)

- Collaborated on the application of structural 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 *Jan 2024 – Present*

Shahid Beheshti University, Tehran, Iran

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](https://doi.org/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), Rajaei 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

- **Programming & Software:** Python (Advanced; NumPy, pandas, scikit-learn, PyTorch, GUDHI), C++ (Intermediate), Bash/Linux, Git (Basic)
- **Data Analysis & Modeling:** fMRI preprocessing, Topological Data Analysis, Network Neuroscience, Machine Learning, Statistical Modeling
- **Research & Visualization Tools:** L^AT_EX (Advanced), Adobe Illustrator (Advanced), Adobe Photoshop (Intermediate), Microsoft Office Suite
- **Technical Competencies:** Scientific computing, data visualization, reproducible research workflows, automation
- **Languages:** Persian (Native), English (Fluent)

TEACHING & MENTORSHIP EXPERIENCE

Python Instructor (Freelance / Online Platforms), Ostadbank & Picha Club, Tehran, Iran Jun 2023 – Present

- Teach Python programming, data analysis, and machine learning to diverse learners.
- Guide students through mini-projects using NumPy, pandas, Matplotlib, scikit-learn, and PyTorch.
- Conduct classes on algorithms, OOP, and game/GUI development (Tkinter, Pygame).

Teaching Assistant, Department of Physics, Shahid Beheshti University Jan 2022 – Jul 2025

- Supported lectures, assignment design, and mentoring for theoretical and computational physics courses.
- Assisted under supervision of:
 - **Prof. Reza Jafari** – Complex Systems Physics (Jan–Jul 2025; Sep 2023–Jan 2024)
 - **Prof. Reza Jafari** – Complex Networks and Graph Theory (Jan–Jul 2025)
 - **Prof. S. Ali Hosseiny Esfidvajani** – Stochastic Processes (Jan–Jul 2024)
 - **Prof. S. Ali Hosseiny Esfidvajani** – Foundations of Numerical Simulations (Sep 2023–Jan 2024)
 - **Prof. Marzieh Farhang** – Analytical Mechanics (Sep 2022–Jan 2023)

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.
 (+98) 21 2990 2773  g_jafari@sbu.ac.ir  gjafari@gmail.com  [HomePage](#)
- **S. Ali Hosseiny Esfidvajani**, Assistant Professor, Faculty of Physics, Shahid Beheshti University, Tehran, Iran.
 (+98) 21 2990 5043  al_hosseiny@sbu.ac.ir  alihd22@gmail.com  [HomePage](#)
- **Marzieh Farhang**, Associate Professor, Faculty of Physics, Shahid Beheshti University, Tehran, Iran.
 (+98) 21 2990 5053  m_farhang@sbu.ac.ir  marzieh.farhang@gmail.com  [HomePage](#)