Curriculum Vitae

Sina Ghafouri

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Education

2019— present	**Degree:**	Master of Science in Physics of Complex Systems
	Where:	Shahid Beheshti University, Tehran, Iran
	GPA:	16.42 of 20

2014— 2019	**Degree:**	Bachelor of Science in Physics
	Where:	Shahid Beheshti University, Tehran, Iran
	GPA:	14.44 of 20

Research Interests

- Statistical Physics, Stochastic Processes and Complex Systems

- Topological Data Analysis (TDA) of Brain Networks

- Agent Based Modeling

- Complex Network Analysis in Neuroscience and Social Science

- Using Data Analysis and Machine Learning in Complex Systems

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Research and Academic Projects

2020— 2021	**Project:**	TDA of Biological Datasets for Anomalies Diagnostic
	Where:	Shahid Beheshti University
	Advisor:	Dr. M. Sadegh Movahed
	Contributions:	

- We used topological data analysis (TDA) in order to analyze biological datasets. We trained a support vector machine (SVM) model with the feature vectors obtained by persistent homology to locate infected regions in chest CT scan.

2017— 2018	**Project:**	Signal Analysis and Manipulation with Python
	Where:	Shahid Beheshti University
	Advisor:	Dr. Ali Sadeghi
	Contributions:	

- I used different data analysis methods like Fourier transform, singular value decomposition (SVD) and JPEG to analyze and manipulate audio and image datasets.

2021— present	**Project:** Dynamical Time Series Analysis using Persistent Homology **Where:** Shahid Beheshti University **Advisor:** Dr. M. Sadegh Movahed **Contributions:**

- I am part of a team that is trying to classify dynamical systems based on chaotic and periodic behaviour using and persistent homology.

2021— present	**Project:** Sentimental Analysis on Persian Twitter **Where:** Shahid Beheshti University **Advisor:** Prof. G. Reza Jafari **Contributions:**

- I am part of a team that is trying to train a model to provide sentimental analysis of Persian comments on Twitter regardless of context.

Skills

- **Proficient in Python and it's major Scientific, Data Analysis and Visualization libraries:** NumPy, SciPy, scikit-learn, TensorFlow/Keras, Pnadas, Matplotlib, Seaborn, PyGame, Ripser, Gudhi.

- **Experienced in:** C/C++, R, MySQL.

- **Casually using:** Linux shell, LaTeX.

Honors and Awards

- Ranked First at Iranian Young Physicists Tournament held at Shahid Beheshti University (2014)

- Accepted in the First Level of National Physics Olympiad (2011)

Teaching

2021	**Position:** Teaching Assistant **Course:** Advanced Computational Physics **Where:** Department of Physics, Shahid Beheshti University

2021	**Position:**	Teaching Assistant
	Course:	Optimization and Computational Approaches
	Where:	Department of Physics, Shahid Beheshti University

Publications

- **Sina Ghafouri**, Mehdi Yousefzadeh, Seyed Mohammad Sadegh Movahed. *"Topological Analysis of Lung CT Scan Images"*. In: The 4th Iranian computational physics conference (Summer 2021).
- **Sina Ghafouri**, Mehdi Yousefzadeh, Seyed Mohammad Sadegh Movahed. *"TDA Based ML Algorithm for Positioning of Infection in Chest CT Scan"*. In: The 5th Iranian computational physics conference (Winter 2022).

Talks and Presentations

- **Topological Analysis of Lung CT Scan Images**
  Summer 2021, the 4th Iranian Computational Physics Conference, Isfahan University of Technology.
- **TDA Based ML Algorithm for Positioning of Infection in Chest CT Scan**
  Winter 2022, the 5th Iranian Computational Physics Conference.

Attended Workshops

2020	**Where:**	University of Maryland
	Title:	Understanding and Exploring Network Epidemiology

Description:
- participants engaged in rigorous multidisciplinary research and training alongside some of the top researchers in the field of network science.

2021	**Where:**	Physics Department of Shahid Beheshti University
	Title:	Statistical Analysis of Cosmic Fields

Description:

- We learned and used some common statistical tools like two-point correlation function, Fourier transform and excursion sets for cosmological data analysis.

References

- **Dr. M. Sadegh Movahed**
  @ Department of Physics, Shahid Beheshti University, Tehran, Iran
  ✉ s.movahed@sbu.ac.ir
  🔗 Homepage
  ● Professor of Physics, Shahid Beheshti University
  ● Resident researcher, School of Physics, Institute for research in fundamental sciences (IPM), Tehran, IRAN. (2013-2021)
  ● Junior Associate of ICTP, International Center for Theoretical Physics, Trieste, ITALY (2009-2016)

- **Prof. G. Reza Jafari**
  @ Department of Physics, Shahid Beheshti University, Tehran, Iran
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  🔗 Homepage
  ● Professor of Physics, Shahid Beheshti University
  ● CCNSD, Physics Department, Shahid Beheshti University (SBU), Tehran, Iran
  ● The Institute for Cognitive and Brain Science (ICBS), Shahid Beheshti University (SBU), Tehran, Iran

- **Dr. Ali Hosseiny Esfidvajani**
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  ● Assistant Professor, Physics Department, Shahid Beheshti University, Tehran, Iran
  ● Resident Researcher, School of Particles and Accelerators Institute for Researches in Fundamental Sciences (IPM), Tehran, Iran