Ali Abolhassanzadeh Mahani

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Education

Academic Qualifications

Sharif University of Technology   *Tehran, Iran*

B.Sc. in Physics   *Sep. 2017 - Jul. 2023*

- My education focused on research on physics of complex systems and network dynamics

Shahid Sadoughi High school (NODET)   *Yazd, Iran*

High school diploma and pre-university course   *2014 - 2018*

- A member of the National Organization for Development of Exceptional Talents
- **Field:** Physics & Mathematics
- **GPA:** 4.0/4.0

Selected Courses

Computational Physics,	*20/20*
Introduction to Psychology,	*20/20*
Complex Systems,	*18/20*
Non-linear Dynamics and Chaos,	*20/20*
Machine Learning in Physics, (course materials on github)	*16.6/20*

Notable Projects

Growing Critical: Self-Organized Criticality in Neural Dynamics   *Tehran, Iran*

A reproduction of the original paper   *Feb. 2021 - PRESENT*

- Analyzing criticality in neuronal growth dynamics model obtained from experiments. We find self-organized criticality in this dynamics, both in theory and in simulations.
- **Advisor:** Dr. Saman Moghimi Araghi
- **Code:** GitHub

A computational study of homophily and diffusion of common knowledge on social networks based on a model of Facebook   *Tehran, Iran*

A reproduction of the original paper   *Spring 2020*

- Here we analyse contagion spread and diffusion of common knowledge in a model of Facebook. We set the game theory rules on three different toy networks and simulate contagion spread.
- **Advisor:** Dr. Fakhteh Ghanbarnezhad
- **Collaborator(s):** Sina Moammar
- **Code:** GitLab

Computational Physics   *Tehran, Iran*

Course Related   *Fall 2020*

- This is where I store my answers to assignments for the *Computational Physics* course. As I was a TA for this course, I felt the need for students to have a point of reference when reviewing their submissions for assignments.
- **Code:** GitHub

Teaching Experience

Teaching Assistant, Sharif University of Technology   *Tehran, Iran*

Computational Physics   *Fall 2021*

Monte Carlo, Metropolis Algorithm, Numerical Methods, Molecular Dynamics

Lecturer, Caspian Olympiad Club, NODET   *Mazandaran, Iran*

Physics Olympiad   *Aug. 2018 - Feb. 2019*

Classical Thermodynamics and Thermal Physics

Certificates

Coursera (University of Washington)
COMPUTATIONAL NEUROSCIENCE

Online

Jul. - Aug. 2022

- **Certificate:** Here
- Course taught by Prof. Rajesh Rao et. al.
- Learned the core concepts of computational neuroscience including but not limited to: neuronal encoding and decoding, GLMs, modeling biological neurons, artificial neural networks, RNNs and the emergence of memory, neural plasticity and neural learning.

Neuromatch Academy
COMPUTATIONAL NEUROSCIENCE

Online

Jul. 2022

- **Certificate:** Here
- Gained expertise in neuronal data analysis in hands-on projects
- Learned how to form researchable questions and plans to answer them.
- Did research on information flow in mouse brain during a sensorimotor task

International Center for Theoretical Physics (ICTP)
8TH WORKSHOP ON COLLABORATIVE SCIENTIFIC SOFTWARE DEVELOPMENT AND MANAGEMENT OF OPEN SOURCE SCIENTIFIC PACKAGES

Online

Oct. - Dec. 2021

- **Certificate:** Here
- **Final Project:** GitLab

Honors & Awards

2017   **Bronze Medal,** Iran 30th National Physics Olympiad

Tehran, Iran

Skills

Programming	Python, C/C++, Julia, LaTeX
Machine Learning	Scikit-learn, PyTorch, TensorFlow, Keras
Data Science	NumPy, SciPy, AstroPy, Matplotlib, Seaborn
Genral	Git, Unix/Linux, Auto-documentation, Computational Neuroscience
Soft Skills	Good Listener, Documentation, Flexible, Responsible, Learning Enthusiast, Extrovert
Languages	Persian (native), English (professional working proficiency), German (elementary level)

Interests

Research	Computational Neuroscience, Brain Computer Interfaces, Cybernetics
Personal	Classical Guitar, Squash, Making Desserts

Extracurricular Activity

Department of Physics, Sharif University of Technology
FUNDRAISER

Tehran, Iran

June 2019 - Jan. 2022

- Gathered and listed structural flaws in the department and prioritized the construction costs
- Co-founded a deposit box for the department with the help of Sharif Foundation that raised over 3 Billion IRR as of spring 2022.

Department of Physics, Sharif University of Technology
PRESIDENT OF STUDENT COUNCIL

Tehran, Iran

Mar. 2012 - Dec. 2021

- Resolved problems among the faculty and students about the quality of education and methods of teaching and examination. Relayed the concerns of over 300 students.
- Negotiated with the board of directors regarding student suggestions for future courses.
- Managed over 300 lockers for students at the physics department.
- Co-organized a group to record popular courses and make them publicly available. Recorded over 10 courses.

Quanta Club, Sharif University of Technology
ORGANIZER

Tehran, Iran

Mar. 2012 - Dec. 2021

- Organized the "Computational Physics" study group at Quanta club under the supervision of the Student Physics Scientific Association.
- Taught dynamic programming as a section of the group syllabus.
- In the second round of this club, I supervised the students and answered their questions.
- Managed all the web content regarding this study circle in this link.