

# Amirhossein Rezaei

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## EDUCATION

### Shahid Beheshti University

*B.Sc. in Physics; GPA: 3.54/4.00*

Tehran, Iran

Sep 2019 – Feb 2024

### Shahid Madani High School, NODET [↗](#)

*National Organization for Development of Exceptional Talents [↗](#)*

Tabriz, Iran

Sep 2013 – Jun 2017

## RESEARCH EXPERIENCE

### Current Role

- Researcher in the Quantum Information and Computation Group of Shahid Beheshti University (QICSBU [↗](#)), under the supervision of [Dr. S.M. Halataei](#).

### Research Papers

- Effects of Nonhelical Component of Hypermagnetic Field on the Evolution of the Matter-Antimatter Asymmetry, Vorticity, and Hypermagnetic Field. *Physical Review D* 104 (5). [↗](#)
- A Deep Learning Framework for Collapse Prediction of Structures Using 1D-CNN for Earthquake Time Series Classification with joint Bayesian hyperparameter optimization and Neural Architecture Search. (*Under review. Pre-print available here* [↗](#).)
- Continuous approximation of the fully connected Ising Hamiltonian: Exact ground state solutions for a novel class of Ising models with applications to fidelity assessment in Ising machines (*Under review. Pre-print available here* [↗](#).)

### Other writings

- Exact and Efficient Numerical approaches to MIT Bag Model. [↗](#)
- A new method for predicting the behavior of the COVID-19 epidemic in Italy. [↗](#)

### Teaching Assistant

- Physics I, Assistant to Dr. Sadeghi
- Computer Programming, Assistant to Dr. Halataei

## RELEVANT COURSES AND GRADES

Quantum Information and Computations	16.8/20
Quantum Mechanics III	18.51/20
Introduction to Artificial Intelligence	17.5/20
Biophysics	20/20
Complex Systems	19/20
Mathematical Physics II	19.5/20
Physics Project	20/20
Astronomy and Astrophysics	17.5/20
Foundations of Numerical Simulations	20/20
Nuclear and Elementary Particle Physics	17.51/20
Thermodynamics and Statistical Mechanics I	17.3/20
Analytical Mechanics I	17.75/20
General Topology	14.5/20
Aesthetics and Philosophy of Art	16/20

For the full grades, see [here](#) [↗](#).

## SKILLS

**Programming:** Python, C, C++, MATLAB, Mathematica, Maple

**Tools and Technologies:** PyTorch, TensorFlow, Keras, Scikit, SciPy, Pandas, MNE, Matplotlib, NumPy, Git, L<sup>A</sup>T<sub>E</sub>X

**Languages:** Persian (Native), English, Azerbaijani, Turkish

## PROJECTS

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### **Divar Scraper with Multithreading** | [GitHub](#)

- Divar Scraper with Multithreading: This project allows you to scrape data from the Divar website, specifically for real estate listings in different categories and cities. It utilizes the Divar API to retrieve and store information about real estate listings in an Excel file. This module provides a command-line tool for scraping posts from a website.

### **TGJU-API** | [GitHub](#)

- TGJU-API: A Python web scraper for retrieving currency and gold prices from the tgju.org website.

### **RKF** | [GitHub](#)

- RKF: Implementation of Runge-Kutta Fehlberg method in pure Python to numerically solve system of ODEs.

### **A Numerical Recipes Project** | [GitHub](#)

- A Numerical Recipes Project: Solving a Stiff System of ODEs using Rosen- Brock Method in C++.

### **Cerebrum Atlas** | [GitHub](#)

- This package can generate a 3D representation of the brain and plot MNI or TAL coordinates onto it, while also returning the corresponding area names.

### **Complex-Systems** | [GitHub](#)

- A repository of Complex Systems ideas and codes.

### **Comprehensive Database of Pollen Grains** | [Medium](#)

- This project leverages the vast amount of data available on the PalDat website to create a valuable resource for deep learning.

### **Optimizing the Ising model in Python** | [Medium](#)

- This project involves simulating a 2D ISING model using various techniques such as utilizing the fast Numba JIT Compiler, implementing parallel processing with Numba's prange, performing branch-less computation, utilizing a lookup table for the exponential function, and optimizing further with a custom random number generator.

## RELATED ACTIVITIES

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### ***Physics Student Association of Shahid Beheshti University (2022-2023)***

- Elected Member, Main Council of Physics Student Association, Shahid Beheshti University
- Volunteered and campaigned for the position, receiving support from students through votes.
- Coordinated events and activities for students interested in physics and related fields.
- Organized weekly seminars and workshops featuring guest speakers from academia and industry.
- Collaborated with other student organizations to promote science education and outreach in the community.

### ***Representative of the Faculty of Physics and Adviser to the University President (2023-2024)***

- Selected Member, Representative of the Faculty of Physics, acting as a voice for the student body.
- Actively involved in advocating for student demands and interests within the faculty.
- Played a key role in enhancing the welfare and academic environment of the Physics department.
- Organized and coordinated events, seminars, and workshops for students and faculty.