Jina Mojahed

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Education

Sharif Univercity of Technology (SUT), Tehran, Iran *Fall 2022 – present*
Bachelor of Physics

- GPA: 18.08/20 (persian link)(Ranked 10th out of 58 in class)

Research Interests

Quantum Mechanics and Gravitation
Fundamental Particle Physics and High-Energy Physics
Special and General Relativity
I have a strong interest in exploring the intersection of quantum mechanics and gravitation, which forms the basis of fundamental particle and high-energy physics. Additionally, my fascination with gravity extends to special and general relativity, providing a broad scope for understanding the fundamental forces of nature.

Notable Course

Analytical Mechanics I *Fall 2023*
Dr. Bahmanabadi *Grade: 18.1/20*

Analytical Mechanics II *Samester 4*
Dr. Bahmanabadi *Grade: 19/20*

Electromagnetism I *Fall 2023*
Dr. Shaant Baghram. (Course Webpage) *Grade: 17/20*

Electromagnetism II *Spring 2024*
Dr. Shaant Baghram. (Course Webpage) *Grade: 20/20*

Electronic *Fall 2023*
Dr. Tehrani *Grade: 20/20*

Electronic Lab *Spring 2024*
Dr. Tehrani *Grade: 19/20*

Astrophysics *Spring 2024*
Dr. Reza Rezaei *Grade: 20/20*

Mathematical physics *Spring 2024*
Dr. Nima Khosravi *Grade: 16.5/20*

Currently Enrolled in Fall 2024

- Quantum Mechanics I (Dr. Laleh Memarzadeh)
- Thermodynamic I (Dr. Vahid KarimPour)
- Introduction to General Relativity (Prof. Sohrab Rahvar)
- Introduction to Elementary Particles (Dr. Amin Faraji Astaneh)

Projects

Fermi Paradox Term Paper (in Persian)

- Written for the course "Introduction to Cosmology," this term paper explores the Fermi Paradox and its implications in the context of extraterrestrial life. The paper is written in Persian and analyzes different possible solutions to the paradox. PDF version available upon request.

MHD (Magnetohydrodynamics) Term Paper (in Persian)

- Written for the course "Electromagnetism II," this term paper covers the fundamentals of Magnetohydrodynamics (MHD) and its applications in astrophysical and laboratory plasmas. The paper is written in

Persian. PDF version available upon request.

Electromagnetic Simulation using Python

- Developed a Python program for the "Electromagnetism I" course to simulate the motion of an electron in an electromagnetic field. The project focused on calculating the electron's trajectory under the influence of Lorentz force and changing magnetic fields. Using a combination of Runge-Kutta methods and vector calculus, the code computes the position and velocity of the electron over time. The simulation also visualizes the electron's path in three dimensions, allowing for better understanding of its motion in the field. PDF version of the code and results is available upon request.

Orbital Simulation using Python

- Developed a Python program for the "Analytical Mechanics I" course, simulating the motion of the Sun, Jupiter, and its moon Callisto over a 6-month period. The project utilizes libraries such as 'numpy' for numerical calculations and 'matplotlib' for creating dynamic animations of the celestial bodies' orbits. The simulation calculates and updates the positions and velocities of these bodies based on gravitational interactions, visualizing their trajectories through a time-stepped animation. The code also employs 'FuncAnimation' for continuous updating of the orbital motion in real-time. PDF version of the code and results is available upon request.

Earth Axis Rotation Simulation using Python

- Developed a Python simulation for the "Analytical Mechanics II" course, modeling the Earth's rotational axis dynamics. The program calculates and visualizes the precession and nutation of the Earth's axis over time, providing a clear representation of these complex rotational movements. Utilizing numerical methods and 'matplotlib' for visualization, the simulation highlights key features of Earth's rotational motion. PDF version of the code and results is available upon request.

Smart Water Level Indicator

- Designed and developed a smart plant pot system using various combinations of diodes, transistors, and capacitors. The goal of the project was to build a circuit that could intelligently monitor and alert about the water level in the pot. The system triggered a buzzer when the water level was too low, and provided alerts for half-full and full water levels as well. Capacitor-based circuits were incorporated to ensure proper energy storage and management throughout the process.Although I do not have a formal report, the experience greatly improved my practical skills in electronics.

Languages

English: (B1-B2 CEFR level)

Persian: Native