

## EDUCATION

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### Sharif University of Technology

B.Sc. in Computer Engineering, GPA: 18.63/20  
B.Sc. in Physics (double major), GPA: 18.83/20  
CGPA: 18.55/20

Tehran, Iran  
September 2020–July 2025  
(Expected)

### Young Scholars Club

Preparation Course for the International Physics Olympiad

Tehran, Iran  
2019–2020

### Allame Helli High school

Diploma in Mathematics and Physics, GPA: 19.66/20

Tehran, Iran  
2017–2020

## EXPERIENCE

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### Swiss Federal Institute of Technology Lausanne (EPFL)

Research intern under the supervision of Prof. Tobias J. Kippenberg at  
Laboratory of Photonics and Quantum Measurements (LPQM).

Lausanne, Switzerland  
July 2023–October 2023

*Developed an automatic qubit characterization system. [Certificate]*

### Mobile Communication Company of Iran (MCI)

*After a series of training sessions and visits to various facilities, we performed data analysis on a huge financial database. [Certificate]*

Tehran, Iran  
November 2022–June 2023

## TEACHING EXPERIENCE

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- **Computer Simulation** (Head TA) Fall 2024 (Current)  
Prof. Afshin Hemmatyar, Sharif University of Technology Kish Campus
- **Programming for Data Analysis** (TA) Summer 2024  
Prof. Amir Mahdi Sadeghzadeh, Sharif University of Technology  
*Designed and graded coding exercises to help students get familiar with `pandas` and `scipy`.*
- **Numerical Computation** (TA) Spring 2024  
Dr. Samira Hossein Ghorban, Sharif University of Technology  
*Designed and graded coding exercises on numerical methods for solving differential equations, specifically an altered version of the Lotka-Volterra (predator-prey) equations. [Repository]*
- **Linear Algebra** (TA) Spring 2023  
Dr. Samira Hossein Ghorban, Sharif University of Technology  
*Helped in grading the assignments.*
- **Engineering Probability and Statistics** (TA) Fall 2022  
Prof. Ali Sharifi-Zarchi, Sharif University of Technology  
*Designed and graded a data analysis assignment on R programming language. [Repository]*
- **Intro Programming (C)** (TA) Fall 2022  
Prof. MohammadAmin Fazli, Sharif University of Technology  
*Designed and graded coding assignments on working with files in C.*
- **Physics Olympiad** (Teacher) 2020–2022  
Allame Helli High school

## HONORS AND AWARDS

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- Selected as one of 41 students worldwide (< 3% acceptance rate) to participate in the **E3 (EPFL Excellence in Engineering)** internship program [Certificate] 2023
- **Silver medalist** at 4<sup>th</sup> European Physics Olympiad, Romania [Certificate] 2020  
*Iran participated in EuPhO as a guest after IPhO 2020 got canceled due to COVID-19.*
- **Sir Isaac Newton Award** (Among the top 200 participants) [Certificate] 2020  
*Sir Isaac Newton Exam (SIN) is a test of high school physics and is offered by the Department of Physics & Astronomy at the University of Waterloo.*
- **Gold medalist** at 31<sup>st</sup> Iranian Physics Olympiad [Certificate] 2019

## PROJECTS & TALKS

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- **Are Genes Everything?!** (Sharif University of Technology) [Slides] Spring 2024  
*I gave a talk on the historical milestones of the Human Genome Project in the US and the latest advancements in DNA sequencing. I also covered the influence of environmental factors on gene expression.*
- **Telegram Group Social Dynamics** (Related course: Network Science) [Repository and Results] Fall 2023  
*Under the supervision of Prof. Saman Moghimi-Araghi, we studied the communication network among members of the course in the Telegram group. We collected data on interactions such as replies and emoji reactions using Telegram's MTProto API and **telethon** library and saved it in a database. We then analyzed the degree distribution of individuals interacting, revealing power-law behavior similar to other social networks. (Also revealing that the professor is the person most interacted with!)*
- **SVM Classifier for Satellite Imagery** (Related course: Machine Learning) [Repository] Fall 2023  
*Under the supervision of Prof. Mahdi Jafari Siavoshani, I trained Support Vector Machine classifiers on the **satimage** dataset. I achieved a test accuracy of 88.7% using the RBF kernel with a one-against-one approach. I also combined multiple one-against-all models to create a multiclass classifier, reaching a test accuracy of 89.6%. My results are close to the 91.7% accuracy reported in Hsu and Lin's work, A Comparison of Methods for Multiclass Support Vector Machines *IEEE Transactions on Neural Networks*.*
- **LPQM Automatic Qubit Calibrator** [Report] Summer 2023  
*We developed an automatic qubit characterization system using Quantum Machines<sup>®</sup> controllers (OPX+ and Octave). Similar to [Google's approach], we implemented a calibration graph consisting of eight calibration nodes. We use spectroscopy techniques to measure and analyze the superconducting qubits' reflection data ( $S_{11}$ ). We have also implemented a database and API for communication among these nodes. Automating the calibration process, formerly done with Vector Network Analyzers, lets us streamline measurements and allows lab researchers to analyze temporal shifts by continuously monitoring resonator frequencies, Qubit frequencies,  $T_1$ , and more.*
- **LPQM Switch Controller** [Repository] [Demo] (Not connected to the real fridge!) Summer 2023  
*I developed a Python package and a web-based GUI for Radiall<sup>™</sup> switches in the Bluefors fridge at LPQM lab, optimizing switching processes to minimize pulse length and reduce heat input during setup changes.*
- **LPQM Autonomous Wafer Testing System** Summer 2023  
*I configured an MPI TS2000-D probe station and a Keithley 4200A-SCS parameter analyzer for remote control. After I found a hardware issue with the prober's GPIB module, I replaced it with an external GPIB module and reconfigured the prober. This enabled successful communication and automated the wafer test setup.*
- **Percolation Models in Disease Dynamics** (Related course: Complex Systems) [Repository] Spring 2023  
*Under the supervision of Prof. Shahin Rouhani, we analyzed disease spread using percolation models on weighted graphs, comparing outcomes with traditional SIR simulations.*
- **Warp Plus** [Repository] Fall 2022–Current  
*Cloudflare's network is one of the few connections linking Iran's restricted internet to the global web. I set up a server to bypass the country's firewall and contributed to open-source tools to create a Warp tunnel. I also developed tools to monitor the tunnel's health and reroute traffic disguised as a fake website, connecting users to the free world.*
- **Java Yu-Gi-Oh!** (Related course: Advanced Programming) [Repository] Spring 2021  
*We made a graphical Java version of the card game, showing our skills in Java programming and game design.*

## NOTABLE COURSES

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- **Introduction to Bioinformatics** (Current)  
*Prof. Ali Sharifi-Zarchi*
- **Machine Learning** (20.0/20) (top undergrad student)  
*Prof. Mahdi Jafari Siavoshani*
- **Computer Simulation** (20.0/20)  
*Prof. Bardia Safaei*
- **Numerical Computation** (20.0/20)  
*Dr. Fatemeh Baharifard*
- **Advanced Programming** (20.0/20)  
*Prof. MohammadAmin Fazli*
- **Neuroscience** (Current)  
*Prof. Saman Moghimi-Araghi*
- **Biophysics** (20.0/20)  
*Prof. Nader Reihani*
- **Network Science** (20.0/20)  
*Prof. Saman Moghimi-Araghi*
- **Complex Systems** (19.5/20)  
*Prof. Shahin Rouhani*
- **Engineering Probability & Statistics** (20.0/20)  
*Prof. Ali Sharifi-Zarchi*

## WORKSHOPS & CERTIFICATIONS

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- **Integrated Photonics for Next Generation Technologies (INGEN2023)** July 2023  
*Saenen, Switzerland*
- **Unlocking the Brain Will Shape Tomorrow's World** March 2023  
*A workshop by Prof. Alireza Valizadeh on advancements in neuroscience. Tehran, Iran*
- **Introduction to Quantum Technologies** [Certificate] March 2023  
*Psiket School of Science and Technology, Tehran, Iran*
- **Qubit by Qubit** [Certificate] September 2022–April 2023  
*IBM Quantum, Online*
- **Key Concepts in Blockchain Technology** [Certificate] Fall 2022  
*IEEE Iran section*
- **Hands on Particle Physics** [Certificate] March 2018  
*The International Particle Physics Outreach Group (IPPOG)*

## COMPUTER SKILLS

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- **Tools and Frameworks:** networkx, scikit-learn, pandas, scipy, numpy, Docker, Git, Linux, L<sup>A</sup>T<sub>E</sub>X
- **Programming Languages:** Python, R, MATLAB, C/C++, SQL, Java, Go, Julia

## LANGUAGES

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- **Persian:** Native
- **English:** Fluent  
[Iran Language Institute certificate]  
(TOEFL exam scheduled for November 2<sup>nd</sup> 2024)

## REFERENCES

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### Prof. Tobias J. Kippenberg

Full Professor, Laboratory of Photonics and Quantum Measurements (LPQM), EPFL  
Email: tobias.kippenberg@epfl.ch

### Dr. Marco Scigliuzzo

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### Prof. Saman Moghimi-Araghi

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