

Mohammad Taha Fakharian

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Education

School of Electrical and Computer Engineering, University of Tehran

Tehran, Iran

B.SC. IN COMPUTER ENGINEERING

Sep. 2019 - present

- **Cum. GPA: 19.43/20 (4/4)**, Faculty Average: 15.1/20
- Related Courses: Artificial Intelligence: 20/20 (4/4), Data Mining (Master's course): 20/20 (4/4), Real Time Embedded Systems: 19/20 (4/4), Internet Engineering: 19.4/20 (4/4), Operating Systems: 19.6/20 (4/4), Engineering Probability and Statistics: 19.6/20 (4/4)

Allameh Helli 3 High School

Tehran, Iran

DIPLOMA IN MATHEMATICS AND PHYSICS

Sep 2016 - Jul. 2019

- **Cum. GPA: 19.9/20**
- As a part of the National Organization for Development of Exceptional Talents (NODET)

Research Interests

- Computational Neuroscience
- Brain-computer Interfaces
- AI in Medicine
- Bioinformatics
- AI in Finance

Research Experience

Under the supervision of Dr. T. Masquelier

CNRS

RESEARCH ASSISTANT

Oct. 2023 - present

We're working on delay learning in spiking neural networks using back-propagation, which can solve complex temporal vision tasks with fewer number of parameters. We are currently reading related papers. Our first step is to modernize the spiking 2D CNN, using separable convolutions. Then, we'll add learnable delays (i.e. replace Conv2d with DCLS3-1d) and for the final step, we'll move to a more challenging and temporal dataset (maybe lip reading).

Under the supervision of Dr. M. Abolghasemi

Centre For Convergent Technologies
Research, University of Tehran

RESEARCH ASSISTANT

Aug. 2023 - present

We are working on biological-plausible improvements such as learning rules on existing spiking neural networks, which can be used to model the human auditory system and solve challenges like the McGurk and Cocktail Party effect. We are currently reading several papers related to this field and developing a new library for high-performance SNN training, named Spyker.

Under the supervision of Dr. A. Shakeri

University of Tehran

RESEARCH ASSISTANT

July. 2022 - Dec. 2022

We are applying graph convolutional neural networks to hate speech detection tasks. We have tried different structures and methods and combined this concept with other state-of-art models like Bert. We have read a numerous number of papers on similar ideas. The research is finished.

Under the supervision of Dr. B. Bahrak

University of Tehran

RESEARCH ASSISTANT

Aug. 2021 - Nov. 2022

We are working on an alternative consensus protocol based on Proof of Activity to combine the benefits of using both the PoS and PoA protocols. We have watched a series of courses and read an abundant number of papers on similar ideas. The research is finished.

Publications

S. Kamali, S. Shabihi, MT. Fakharian, A. Arbabi, P. Tajmehrabadi, M. Saadati, B. Bahrak (2022) "RPoA: Redefined Proof of Activity". Submitted.

Honors & Awards

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| 2023 | Ranked 1st among bachelor students of the Computer Engineering , University of Tehran | Tehran, Iran |
| 2019 | Ranked 96 (Top 0.1%) in National University Entrance Exam , National Organization of Educational Testing (NOET) | Tehran, Iran |
| 2019 | Received scholarship , Supporter Foundation of the University of Tehran | Tehran, Iran |

Teaching Experience

UNIVERSITY OF TEHRAN ACM STUDENT CHAPTER

Artificial Intelligence and Deep Learning Course Mentor SUMMER OF CODE

Jul. 2022 - Sep. 2022

UNIVERSITY OF TEHRAN

Head Teaching Assistant	ARTIFICIAL INTELLIGENCE, DR. Y. YAGHOOBZADEH, H. FADAEI	Fall 2023
Teaching Assistant	DATA MINING, DR. A. SHAKERY	Spring 2023
Head Teaching Assistant	ADVANCED PROGRAMMING, DR. R. KHOSRAVI	Fall 2022 - Spring 2023
Supervising Teaching Assistant	ENGINEERING PROBABILITY AND STATISTICS, DR. B. BAHRAK	Fall 2022
Teaching Assistant	ADVANCED PROGRAMMING, DR. R. KHOSRAVI	Spring 2021 - Fall 2021 - Spring 2022
Teaching Assistant	ENGINEERING PROBABILITY AND STATISTICS, DR. B. BAHRAK	Fall 2021
Teaching Assistant	DISCRETE MATHEMATICS, DR. S. MOHAMMADI	Spring 2021 - Fall 2021 - Spring 2022
Teaching Assistant	OPERATING SYSTEMS, DR. M. KARGAHI	Fall 2022 - Spring 2023 - Fall 2023
Teaching Assistant	ARTIFICIAL INTELLIGENCE, DR. Y. YAGHOOBZADEH, H. FADAEI	Fall 2022 - Spring 2023
Teaching Assistant	FORMAL LANGUAGES AND AUTOMATA THEORY, DR. H. HOJJAT	Fall 2021 - Spring 2022

Industrial Experience

Tapsi

Tehran, Iran

DATA SCIENTIST

Mar. 2023 - present

Dealing with real-world challenges for an online ride-hailing system, I've improved my ability to think efficiently about problems and find the best breakdown for them. The data science team is directed by Mr. Ali Elahi and managed by Mrs. Zeinab Taghavi. The atmosphere of the team helped me improve my ability, both in problem-solving and learning new methods. Currently, I'm a member of both the Automation and Map team, working on a variety of products, from Generative AI to recommender systems.

Licenses

Game Theory	STANDFORD UNIVERSITY, THE UNIVERSITY OF BRITISH COLUMBIA	Aug. 2023
Machine Learning Engineering for Production (MLOps) Specialization	DEEPLARNING.AI	Aug. 2022
Natural Language Processing Specialization	DEEPLARNING.AI	Jul. 2022
AI for Medicine Specialization	DEEPLARNING.AI	May. 2022
Generative Adversarial Networks (GANs) Specialization	DEEPLARNING.AI	May. 2022
Deep Learning Specialization	DEEPLARNING.AI	Feb. 2022
Machine Learning	STANFORD UNIVERSITY	Feb. 2022
Reinforcement Learning Specialization	UNIVERSITY OF ALBERTA	Feb. 2022

Notable Academic Projects

Spiral

Computational Neuroscience

A PYTHON PACKAGE FOR SPIKING NEURAL NETWORK SIMULATION USING PYTORCH ON CUDA OR CPU

Contributed some efficient and interesting features to this package during my personal research.

Crystalline

Cryptocurrency

A CRYPTOCURRENCY POWERED BY A REDEFINED PoA PROTOCOL

Developed as a proof of concept on pure Python, this cryptocurrency incorporates a newly defined Proof of Activity as its primary consensus protocol. It was designed and researched by me and several other students of the University of Tehran.

Earthquake Damage Prediction model

Data Mining

THE FINAL PROJECT OF DATA MINING COURSE

This project includes data preprocessing, feature selection and model selection with feature generation as a bonus part on Gorkha's buildings' dataset. Each step has its own analysis.

Oak

Internet Engineering

THE MAIN PROJECT OF INTERNET ENGINEERING COURSE

A complete implementation of a website from scratch by me and my teammate. This project was developed using Java and Spring for the back-end, and React for its front-end. We have used tools like CI/CD pipelines, JDBC, JUnit, Github OAuth apps, etc. The project is a marketplace for merchants and customers. Merchants can register their products and customers can buy, rate, and comment on the commodities.

Smart Pot

Real Time Embedded Systems

THE FIRST PROJECT OF REAL TIME EMBEDDED SYSTEMS COURSE

The project was about designing and implementing a smart pot that automatically waters the plant based on the soil moisture level and temperature. The project was implemented using Arduino and C++. The pot was equipped with a temperature sensor, a humidity sensor, and a water pump. Different modules communicated via Bluetooth and the master chip could adjust the water pump irrigation based on the sensor readings.

XV6 Kernel

Operating Systems Lab

XV6 KERNEL WITH IMPROVEMENTS

Adding some new features such as new system calls, three new custom task schedulers, and a process synchronization (using semaphore) to xv6 kernel.

CMM Compiler

Compiler Design

A COMPILER FOR A PROGRAMMING LANGUAGE

A compiler for new functional Language called CMM. The project had four phases: Grammar specification, Type Analysis, Name Analysis and ByteCode Generation.

Socket Server

Computer Networks

FULLY FUNCTIONING SOCKET SERVERS

Three fully functioning socket servers, consist of a ftp server, a web server and a chat server, with many capabilities implemented in C++ that uses socket programming to communicate with clients at a low level.

Skills

Programming	High Intermediate: C++, Python
	Intermediate: C, Java
	Beginner: Lua, Bash, LaTeX
Technologies	Git, Docker, K8, Makefile
Data Science	Pandas, NumPy, PySpark, Pytorch, Keras, Tensorflow, Trax and Scikit-learn
Operating Systems	Linux (Debian-based and Arch-based), Windows

Languages

Persian	Native
English	Professional working proficiency Academic IELTS: 7.5/9 [R:8.5, L:8.5, S:6.5, W:6.5] (Oct. 2023)