

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 - Jul. 2024

- **Cum. GPA: 19.47/20 (4/4)**, Faculty Average: 15.01/20
- Related Courses: Artificial Intelligence: 20/20(4/4), Data Mining(Master's course): 20/20 (4/4), Interactive Learning(Master's course): 20/20 (4/4), Cognitive Neuroscience: 18.5/20 (4/4), Engineering Probability and Statistics: 19.6/20 (4/4), Real Time Embedded Systems: 19/20 (4/4), Internet Engineering: 19.4/20 (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

- NeuroAI
- Machine Learning for Neuroscience
- Computational Neuroscience
- Neuroinformatics
- Brain-computer Interfaces

Research Experience

Under the supervision of Prof. Shervin Safavi

CMC Lab, TU Dresden

RESEARCH ASSISTANT

Jun. 2024 - present

Trained RNNs on a set of cognitive tasks from the NeuroGym library and used dynamical similarity analysis (DSA) to investigate different factors affecting dynamics.

Under the supervision of Prof. Timothée Masquelier

CNRS

RESEARCH ASSISTANT

Oct. 2023 - present

Explored delay learning in spiking neural networks using surrogate gradient. Applied dilated convolution with learnable spacings, as a model of neural delay, on SOTA models based on ResNet-18, for solving complex event-based datasets.

Under the supervision of Prof. Mohammadreza Abolghasemi

Convergent Technologies Research

Institute, University of Tehran

RESEARCH ASSISTANT

Sep. 2023 - Jun. 2024

Explored biological-plausible improvements, like learning rules on existing spiking neural networks. Implemented adaptive threshold for neurons and complex Hebbian learning, using a library for high-performance SNN training named Spyker.

Under the supervision of Prof. Azadeh Shakery

University of Tehran

RESEARCH ASSISTANT

July. 2022 - Dec. 2022

Applied graph convolutional neural networks to hate speech detection task. Tried different structures and methods and combined the concept with other SOTA models like Bert.

Under the supervision of Prof. Behnam Bahrak

University of Tehran

RESEARCH ASSISTANT

Aug. 2021 - Nov. 2022

Introduced an alternative consensus protocol, based on Proof of Activity, to combine the benefits of using both the PoS and PoA protocols.

Publications

A. Ghalambor, **MT. Fakharian**, R. Zeraati, S. Safavi (2024) "Identifying task-specific dynamics in recurrent neural networks using Dynamical Similarity Analysis." Bernstein Conference 2024.

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

Honors & Awards

2024	Best data analysis project , BR41N.IO Hackathon	<i>g.tec Spring School</i>
2024	Ranked 1st among bachelor students of the Computer Engineering , University of Tehran	<i>Tehran, Iran</i>
2019	Ranked 96 (Top 0.1%) in National University Entrance Exam , National Organization of Educational Testing (NOET)	<i>Tehran, Iran</i>
2019	Received scholarship , Supporter Foundation of the University of Tehran	<i>Tehran, Iran</i>

Teaching Experience

UNIVERSITY OF TEHRAN ACM STUDENT CHAPTER

Artificial Intelligence and Deep Learning Course Mentor	SUMMER OF CODE	<i>Jul. 2022 - Sep. 2022</i>
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UNIVERSITY OF TEHRAN

Head Teaching Assistant	INTRODUCTION TO DATA SCIENCE, PROF. B. BAHRAK, PROF. Y. YAGHOOBZADEH	<i>Spring 2024</i>
Teaching Assistant	SOFTWARE ENGINEERING, PROF. R. KHOSRAVI	<i>Spring 2024</i>
Head Teaching Assistant	ARTIFICIAL INTELLIGENCE, PROF. Y. YAGHOOBZADEH, H. FADAEI	<i>Fall 2023</i>
Teaching Assistant	DATA MINING, PROF. A. SHAKERY	<i>Spring 2023</i>
Head Teaching Assistant	ADVANCED PROGRAMMING, PROF. R. KHOSRAVI	<i>Fall 2022 - Spring 2023</i>
Supervising Teaching Assistant	ENGINEERING PROBABILITY AND STATISTICS, PROF. B. BAHRAK	<i>Fall 2022</i>
Teaching Assistant	ADVANCED PROGRAMMING, PROF. R. KHOSRAVI	<i>Spring 2021 - Fall 2021 - Spring 2022</i>
Teaching Assistant	ENGINEERING PROBABILITY AND STATISTICS, PROF. B. BAHRAK	<i>Fall 2021</i>
Teaching Assistant	DISCRETE MATHEMATICS, PROF. S. MOHAMMADI	<i>Spring 2021 - Fall 2021 - Spring 2022</i>
Teaching Assistant	OPERATING SYSTEMS, PROF. M. KARGAHI	<i>Fall 2022 - Spring 2023 - Fall 2023</i>
Teaching Assistant	ARTIFICIAL INTELLIGENCE, PROF. Y. YAGHOOBZADEH, H. FADAEI	<i>Fall 2022 - Spring 2023</i>
Teaching Assistant	FORMAL LANGUAGES AND AUTOMATA THEORY, PROF. H. HOJJAT	<i>Fall 2021 - Spring 2022</i>

Industrial Experience

AbanPrime	<i>Tehran, Iran</i>
SOFTWARE ENGINEER	<i>Jun. 2024 - present</i>

Participated in developing a market maker bot. Designed and implemented risk management and efficient trading algorithms. Dealt with many learning opportunities and responsibilities while working in a crypto exchange startup.

Tapsi	<i>Tehran, Iran</i>
DATA SCIENTIST	<i>Mar. 2023 - Jan. 2024</i>

Improved the ability to think efficiently about problems and find the best breakdown for them while dealing with real-world challenges for an online ride-hailing system. Worked on a variety of products, from generative AI to recommender systems. The data science team was directed by Mr. Ali Elahi and managed by Mrs. Zeinab Taghavi.

Licenses

NeuroAI	NEUROMATCH ACADEMY	<i>Jul. 2024</i>
Game Theory	STANDFORD UNIVERSITY, THE UNIVERSITY OF BRITISH COLUMBIA	<i>Aug. 2023</i>
Machine Learning Engineering for Production (MLOps) Specialization	DEEPLARNING.AI	<i>Aug. 2022</i>
Natural Language Processing Specialization	DEEPLARNING.AI	<i>Jul. 2022</i>
AI for Medicine Specialization	DEEPLARNING.AI	<i>May. 2022</i>
Generative Adversarial Networks (GANs) Specialization	DEEPLARNING.AI	<i>May. 2022</i>
Deep Learning Specialization	DEEPLARNING.AI	<i>Feb. 2022</i>
Machine Learning	STANFORD UNIVERSITY	<i>Feb. 2022</i>
Reinforcement Learning Specialization	UNIVERSITY OF ALBERTA	<i>Feb. 2022</i>

Notable Academic Projects

Spiral

Computational Neuroscience

A PYTHON PACKAGE FOR SPIKING NEURAL NETWORK SIMULATION

Added features for better analysis and training 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.

Earthquake Damage Prediction Model

Data Mining

THE FINAL PROJECT OF DATA MINING COURSE

Performed data preprocessing, feature selection and model selection with feature generation as a bonus part on Gorkha's buildings' dataset.

Oak

Internet Engineering

THE MAIN PROJECT OF INTERNET ENGINEERING COURSE

Implemented a project similar to Amazon marketplace using Java, Docker, Spring, ReactJS and Maven.

Smart Pot

Real Time Embedded Systems

THE FIRST PROJECT OF REAL TIME EMBEDDED SYSTEMS COURSE

Designed a smart pot that automatically waters the plant based on the soil moisture level and temperature. Implemented using Arduino and C++. Equipped with a temperature sensor, a humidity sensor, and a water pump. Different modules communicated via Bluetooth.

XV6 Kernel

Operating Systems Lab

XV6 KERNEL WITH IMPROVEMENTS

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

Socket Server

Computer Networks

FULLY FUNCTIONING SOCKET SERVERS

Implemented 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, Javascript, LaTeX
	Beginner: Lua, Bash
Data Science	Pandas, NumPy, PySpark, Pytorch, Keras, Tensorflow, Trax and Scikit-learn
Tools and Frameworks	High Intermediate: Git, Django, Spring
	Intermediate: Docker, Maven, VueJS
	Beginner: K8, ReactJS
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)