

# Avisa Fallah

School of Mathematics, Statistics and Computer Science, University of Tehran, Tehran, Iran.

☎ (+98) 902-7227-467 | ✉ [avisafallah2001@gmail.com](mailto:avisafallah2001@gmail.com) | 🏠 [avisafallah.github.io](https://avisafallah.github.io) | 📷 [avisafallah](#) | 🌐 [AvisaFallah](#)

## Education

### College of Mathematics, Statistics and Computer Science, University of Tehran

Tehran, Iran

B.SC. IN COMPUTER SCIENCE

Sep. 2019 - Jul. 2024

- CGPA: 18.41/20 via 136 units (3.74/4) · Last two year GPA: 19.13/20 (4/4)

### Negaresh High School

Tehran, Iran

DIPLOMA IN MATHEMATICS AND PHYSICS DISCIPLINE

Sep 2018 - Jul. 2019

- CGPA: 19.61/20

## Research Interests

- Computational Neuroscience
- LLM in Neuro-Cog
- Cognitive Games & AR & VR
- Psycho Chatbots
- Neuroimaging (fMRI, PET, CT, EEG)
- Predictive Models

## Publications

(1) Fallah A., Zandiyevakili Y., and Sajedi H. "Handwriting Image-Based AI Models for Dysgraphia Diagnosis: A Comprehensive Scoping Review". Plos One. (Under Review)

(2) Fallah A., Keramati A., Nazari M., and Mirfazeli F. "Automating Theory of Mind Assessment with a LLaMA-3-Powered Chatbot: Enhancing Faux Pas Detection in Autism". 14th International Conference on Computer and Knowledge Engineering (ICCKE 2024). Affiliated with IEEE Xplore. (Accepted)

(3) Fallah A., Zandiyevakili Y., Salehi Z., Kavousi K. "AI-powered PET imaging analysis for enhanced Parkinson's disease diagnosis". 3rd International & 12th Iranian Conference on Bioinformatics.

(4) Zandiyevakili Y., Fallah A., Esmaeili K., and Sajedi H. "Revolutionizing Dysgraphia Detection: Combining Feature Fusion with Non-discriminatory Regularization". 12th RSI International Conference on Robotics and Mechatronics (ICRoM 2024). Affiliated with IEEE Xplore. (Under Review)

(5) Zandiyevakili Y., Fallah A., and Zakeri S. "Enhancing Sentiment Analysis of Persian Tweets: A Transformer-Based Approach". 10th International Conference on Web Research (ICWR2024). Affiliated with IEEE Xplore.

(6) Zandiyevakili Y., Fallah A., and Sajedi H. "Distilled BERT Model In Natural Language Processing". 14th International Conference on Computer and Knowledge Engineering (ICCKE 2024). Affiliated with IEEE Xplore. (Accepted)

(8) Vafae Sharbaf F., Salehi Z., Fallah A., Nouruzi F., Mostafavi Abdolmaleky H. and Kavousi K. "Multi-Omics Data Integration and Computational Modeling in Neurocognitive Disorders: A systematic review". Molecular Neurobiology. (Under Review)

## Research Experience

### RA at National Brain Centre & Cognitive Sciences and Technologies Council

Iran University of Medical Sciences

UNDER THE SUPERVISION OF PROF. M. T. JOGHATAEI & PROF. F. S. MIRFAZELI

Dec. 2023 - present

- Automating Faux Pas Recognition Test (LLaMA-3-Powered Chatbot) and Rehab in Autism
- Classifying individuals as healthy or unhealthy based on MoCA test images · - fMRI study on Deception behavior
- Meta-analysis on the Impact of Music Therapy on Social Interactions in Autism · - Implementing Cognitive Games
- Processed EEG data for analyzing brain wave patterns in a photothrombosis stroke model study in laboratory mice
- Developing AI-driven RFPs for mental disorders diagnostics and treatments

### RA at Image Brain Institute

Tehran, Iran

UNDER THE SUPERVISION OF PROF. M. NAZARI

Aug. 2024 - Present

- Automating Faux Pas Recognition Test (LLaMA-3-Powered Chatbot) and Rehab in Autism

### RA at Neuromatch Impact Scholars Program

Neuromatch Academy

UNDER THE SUPERVISION OF DR. MARIANO CABEZAS GREBOL

Aug. 2024 - Present

- Analyzed fMRI data (HCP) to compare GLM and LSTM models in predicting risky decision-making, focusing on the role of the Default Mode Network (DMN) in gambling scenarios.
- Applied reinforcement learning models and hierarchical Bayesian approaches to explore the DMN's role in decision-making under uncertainty.

## RA at Iranian Bioinformatics Society (IBIS)

UNDER THE SUPERVISION OF PROF. K. KAVOUSI

- Advancing Parkinson's Disease Diagnosis Through Enhanced PET Imaging Analysis
- Decoding Neurocognitive Disorders Through Computational Analysis
- Developing AI-driven RFPs for mental disorders diagnostics and treatments

University of Tehran

Sep. 2023 - present

## RA at Innovation And Development Of Artificial Intelligence Center

UNDER THE SUPERVISION OF PROF. M. GOODARZI

- Developing a system to detect brain hemorrhages in CT scans and provide urgent treatment

ICT Research Institute

Oct. 2023 - Jan 2024

## Competitions

### NeuroScience Competition

HOSTED BY PROF. M. VAZIRI PASHKAM

- Conducted an eye-tracking study comparing facial recognition patterns in Mild Cognitive Impairment (MCI) patients and healthy individuals.
- Developed strategies to enhance facial recognition in MCI patients using visual salience techniques.

Tehran, Iran

Mar. 2024 - Present

### Generative Artificial Intelligence for women

UNDER THE SUPERVISION OF PROF. M. GOODARZI

- Developing a system to detect brain hemorrhages in CT scans and provide urgent treatment

ICT Research Institute

Oct. 2023 - Jan 2024

## Skills

**Neuro-Experimental Tools** fMRI, EEG, Psychtoolbox

**Programming Languages** Python, MATLAB, R, C/C++, LaTeX, MySQL

**Frameworks & Libraries** TensorFlow, Keras, LangChain, PyTorch, scikit-learn, Pandas, NumPy

**Graphic Design Tools** Photoshop, Blender, Illustrator

**Soft Skills** Creativity, Teamwork, Problem Solving, Social Communication

## Academic Projects

### Predicting Gambling Outcomes

RECURRENT NEURAL NETWORKS

Predicting Gambling Outcomes using fMRI dataset (HCP), Long Short Term Memory (LSTM) & Generalized Linear Model (GLM).

Predictive Models

Keras, TensorFlow, scikit-learn, nilearn

### Blood cell Classification

CONVOLUTIONAL NEURAL NETWORK (CNN)

Classified normal (healthy) and abnormal (unhealthy) blood cells.

Image processing

Keras, TensorFlow, scikit-learn

### Handwritten Recognition (HWR)

NEURAL NETWORKS

Kurdish Handwritten Character (CNN) · English Handwritten Character (NN) · Persian Handwritten Digit (FNN)

Image Processing

Keras, TensorFlow, scikit-learn

### The Tour De Flags Maze

Q-LEARNING

Trained an agent for efficient flag collection and target navigation with optimized parameters. · visualized the learning progress

Artificial Intelligence

Python, tkinter

### Four-Connect

MINIMAX, MINIMAX WITH ALPHA-BETA PRUNING, AND MONTE CARLO TREE SEARCH

Implemented the Four-Connect game in multiple game modes: two-player, human-AI, and AI-AI gameplay.

Artificial Intelligence

Python, pygame

### 8-Puzzle

SEARCH ALGORITHMS

Solved the 8-puzzle problem, focusing on minimizing execution time using various search algorithms (Heuristic, DFS, BFS, UCS, IDS, A\*).

Artificial Intelligence

Python

## Relevant Courses

- Artificial Intelligence (20/20)
- Image Processing (18/20)
- Scientific Computing (20/20)
- General Biology (20/20)
- Introduction to Bioinformatics (20/20)
- General Chemistry + Lab (19.8/20)
- Linear Algebra (19.4/20)
- Probability 1 (17.5/20)
- Statistical Methods (18.75/20)

## Honors & Awards

2023	<b>The Deputy Head</b> , Computer Science Students' Scientific Chapter at University of Tehran	<i>Tehran, Iran</i>
2024	<b>Ranked 4th among B.Sc. students</b> , Computer Science at the University of Tehran	<i>Tehran, Iran</i>

## Teaching Experience

<b>Image Processing</b>	TA	<b>Discrete Mathematics</b>	SUPERVISOR TA	<b>Linear Algebra</b>	TA
<b>General Mathimatics 2</b>	HEAD TA	<b>Advanced Programming</b>	TA		
<b>General Calculus 1</b>	HEAD TA	<b>Basic Programming</b>	TA	<b>Database Design</b>	TA

## Certifications

<b>Computational Neuroscience</b>	NEUROMATCH ACADEMY	<i>Jul. 2024</i>
<b>Supervised Machine Learning: Regression and Classification</b>	DEEPLARNING.AI	<i>Aug. 2023</i>
<b>Build Basic Generative Adversarial Networks (GANs)</b>	DEEPLARNING.AI	<i>Sep. 2023</i>
<b>Neural Networks and Deep Learning</b>	DEEPLARNING.AI	<i>Sep. 2023</i>
<b>Workshop on “How to be a Teaching Assistant”</b>	UNIVERSITY OF TEHRAN	<i>Nov. 2022</i>
<b>Digital Painting</b>	TEHRAN INSTITUTE OF TECHNOLOGY	<i>Jan. 2023</i>
<b>Strategic Thinking</b>	TEHRAN INSTITUTE OF TECHNOLOGY	<i>Mar. 2023</i>
<b>Adobe Illustrator Comprehensive Course</b>	INVERSE SCHOOL	<i>In progress</i>
<b>Blender Comprehensive Course</b>	INVERSE SCHOOL	<i>In progress</i>

## Volunteer Activities

<b>Volunteer Assistant</b>	<i>Tehran, Iran</i>
EHSAN-ARAMESH-CHARITY	<i>July. 2023 - Present</i>
• I offered my time as a volunteer assistant at Ehsan-Aramesh-Charity, connecting with individuals facing diverse physical, mental, and social challenges. My goal was to inspire hope and support their journey back into society.	
<b>Mathematics Teacher</b>	<i>Tehran, Iran</i>
	<i>Sep. 2019 - Apr. 2022</i>
• Engaged in voluntary teaching of mathematics to students unable to afford educational expenses.	

## Interests

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|--|---------------------------------|
| • Art (Painting, Singing, Writing, Poetry, Novels) | • Sports (Volleyball, Swimming) |
| • Music and Movies                                 | • Charity Work                  |

## Paintings

Visit my [Art Portfolio](#) to explore a diverse collection of my original paintings, showcasing my creativity, innovation, and high passion for painting.

## Languages

<b>Persian</b>	Native
<b>English</b>	Proficient
<b>French</b>	Beginner
<b>Arabic</b>	Familiar