Avisa **Fallah**

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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**
- **Psycho Chatbots**
- **LLM in Neuro-Cog**
- **Neuroimaging (fMRI, PET, CT, EEG)**
- **Cognitive Games & AR & VR**
- **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. **"Enhacing 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) Vafaee 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) — *University of Tehran*

Under the supervision of Prof. K. Kavousi — *Sep. 2023 - present*

- 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

RA at Innovation And Development Of Artificial Intelligence Center — *ICT Research Institute*

Under the supervision of Prof. M. Goodarzi — *Oct. 2023 - Jan 2024*

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

Competitions

NeuroScience Competition — *Tehran, Iran*

Hosted by Prof. M. Vaziri Pashkam — *Mar. 2024 - Present*

- 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.

Generative Artificial Intelligence for women — *ICT Research Institute*

Under the supervision of Prof. M. Goodarzi — *Oct. 2023 - Jan 2024*

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

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 — *Predictive Models*

Recurrent Neural Networks — *Keras, TensorFlow, scikit-learn, nilearn*

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

Blood cell Classification — *Image processing*

Convolutional Neural Network (CNN) — *Keras, TensorFlow, scikit-learn*

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

Handwritten Recognition (HWR) — *Image Processing*

Neural Networks — *Keras, TensorFlow, scikit-learn*

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

The Tour De Flags Maze — *Artificial Intelligence*

Q-Learning — *Python, tkinter*

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

Four-Connect — *Artificial Intelligence*

Minimax, Minimax with alpha-beta pruning, and Monte Carlo Tree Search — *Python, pygame*

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

8-Puzzle — *Artificial Intelligence*

Search Algorithms — *Pyhton*

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

Honors & Awards

2023 **The Deputy Head**, Computer Science Students' Scientific Chapter at University of Tehran — *Tehran, Iran*

2024 **Ranked 4th among B.Sc. students**, Computer Science at the University of Tehran — *Tehran, Iran*

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)**

Teaching Experience

Image Processing TA
General Mathimatics 2 Head TA
General Calculus 1 Head TA
Discrete Mathematics Supervisor TA
Advanced Programming TA
Basic Programming TA
Linear Algebra TA
Database Design TA

Certifications

Computational Neuroscience Neuromatch Academy *Jul. 2024*
Supervised Machine Learning: Regression and Classification DeepLearning.AI *Aug. 2023*
Build Basic Generative Adversarial Networks (GANs) DeepLearning.AI *Sep. 2023*
Neural Networks and Deep Learning DeepLearning.AI *Sep. 2023*
Workshop on "How to be a Teaching Assistant" University of Tehran *Nov. 2022*
Digital Painting Tehran Institute of Technology *Jan. 2023*
Strategic Thinking Tehran Institute of Technology *Mar. 2023*
Adobe Illustrator Comprehensive Course Inverse School *In progress*
Blender Comprehensive Course Inverse School *In progress*

Volunteer Activities

Volunteer Assistant *Tehran, Iran*
Ehsan-Aramesh-Charity *July. 2023 - Present*

- 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.

Mathematics Teacher *Tehran, Iran*
Sep. 2019 - Apr. 2022

- Engaged in voluntary teaching of mathematics to students unable to afford educational expenses.

Interests

- **Art (Painting, Singing, Writing, Poetry, Novels)**
- **Music and Movies**
- **Sports (Volleyball, Swimming)**
- **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

Persian Native
English Proficient
French Beginner
Arabic Familiar