Avisa **Fallah**

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Education

College of Mathematics, Statistics and Computer Science, University of Tehran — *Tehran, Iran*

B.Sc. in Computer Science (Major Study) — *Sep. 2019 - present*

- CGPA: 18.34/20 via 117 units (3.7/4)
- Last year GPA: 19.42/20 (4/4)

Negaresh High School — *Tehran, Iran*

Diploma in Mathematics and Physics Discipline — *Sep 2018 - Jul. 2019*

- CGPA: 19.61/20

Farzanegan High School — *Tehran, Iran*

Highschool, Mathematics and Physics — *Sep 2016 - Jul. 2018*

- CGPA: 19.59/20

Research Interests

- **Neuroscience & Cognitive Science**
- **Computational Neuroscience**
- **Neuroimaging**
- **AI in Healthcare & Medicine**
- **Medical Image Processing**
- **EEG**
- **Cognitive Games & AR & VR**
- **Behaviroal Tests**
- **Generative AI**

Publications

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. (Accepted)

Keramati A., Fallah A., and Taghiyareh F. **"Enhanced Iranian Integrated Healthcare System Through Root Cause Analysis"**. Iranian Conference on Advances in Enterprise Architecture. Affiliated with IEEE Xplore. (under review)

Research Experience

Research Assistant at National Brain Center — *Iran University of Medical Sciences*

Under the supervision of Prof. M. T. Joghataei & Prof. F. S. Mirfazeli — *Jul. 2023 - present*

Our research primarily focuses on brain function, cognitive disabilities, and mental disorders. I have applied my AI and image-processing skills to our research efforts, gaining experience in designing and implementing cognitive games tailored for individuals with cognitive disabilities, particularly in the context of movement disabilities. In our most recent project, we investigate lying behavior and measure brain functions during various behavioral tests. Additionally, I have familiarized myself with EEG technology, particularly in its application to studying ADHD in children.

Research Assistant at Cognitive Sciences and Technologies Council & Iranian Bioinformatics Society (IBIS) — *University of Tehran*

Under the supervision of Prof. K. Kavousi & Prof. M. T. Joghataei — *Sep. 2023 - present*

In our current focus on mental disorders and diseases, we have initiated several new Requests for Proposals (RFPs) aimed at diagnosing and developing treatment strategies for mental illnesses. Leveraging a combination of advanced AI tools and algorithms along with bioinformatics knowledge, we are endeavoring to propose various pathways and solutions to address our knowledge gaps in assisting these patients.

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

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

Our current focus is on designing a system with a detection and treatment approach. The goal is to facilitate the identification of brain hemorrhages in CT scan images, where detection is challenging for medical professionals, and to provide treatment in urgent situations.

Teaching Experience

Teaching Experience at University of Tehran

Image Processing	Teaching Assistant	*Jan. 2024 - Present*
Discrete Mathematics	Supervising Teaching Assistant	*Aug. 2023 - Present*
Calculus 1	Head Teaching Assistant	*Aug. 2023 - Feb. 2023*
Database Design	Teaching Assistant	*Aug. 2023 - Feb. 2023*
Calculus 2	Head Teaching Assistant	*Feb. 2023 - Aug. 2023*
Introduction to Computer Science and Programming	Teaching Assistant	*Feb. 2023 - Aug. 2023*
Discrete Mathematics	Teaching Assistant	*Aug. 2022 - Aug. 2023*
Advanced Programming	Teaching Assistant	*Aug. 2022 - Feb. 2023*
Linear Algebra	Teaching Assistant	*Aug. 2022 - Feb. 2023*
Calculus 2	Teaching Assistant	*Aug. 2021 - Aug. 2022*

Relevant Courses

- **Artificial Intelligence (20/20)**
- **Linear Algebra (19.4/20)**
- **Database Management Systems (20/20)**
- **Probability 1 (17.5/20)**
- **Statistical Methods (18.75/20)**
- **Strategic Games 1 (18.5/20)**
- **Image Processing (18/20)**
- **General Biology (20/20)**
- **General Chemistry (19.8/20)**
- **General Chemistry Laboratory (19.75/20)**
- **Design and Analysis of Algorithms (20/20)**
- **Fundamentals of Software Design (20/20)**
- **Fundamentals of Computer Science and Programming (20/20)**
- **Advanced Programming (20/20)**

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*
2019	**Ranked in the top 1% in Konkour**, National Organization of Educational Testing (NOET)	*Tehran, Iran*

Academic Projects

Blood cell Classification *Image processing*

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

I implemented four different convolutional neural networks (CNNs) to classify normal (healthy) and abnormal (unhealthy) blood cells.

Kurdish Handwritten Recognition *Image processing*

Convolutional Neural Network (CNN) *Keras, TensorFlow*

I implemented four different convolutional neural networks (CNNs) for Kurdish handwritten recognition.

English Handwritten Recognition *Mathematics Laboratory*

Neural Network *Keras, TensorFlow*

I constructed a neural network model using the Keras and TensorFlow libraries to classify the A-Z Handwritten Alphabets dataset.

Persian Handwritten Digit Recognition *Mathematics Laboratory*

Feed-Forward Neural Network *scikit-learn*

I developed a feed-forward neural network from scratch for classifying Persian handwritten digits' dataset.

The Tour De Flags Maze *Artificial Intelligence*

Q-Learning *Python, tkinter*

I trained an agent, capable of efficiently collecting multiple flags within the maze while navigating to the target cell with Q-Learning and optimized learning parameters (alpha and gamma). Finally,visualized the learning progress with graphical representation using tkinter library.

Four-Connect *Artificial Intelligence*

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

I implemented the Four-Connect game in multiple game modes, including two-player, human-AI, and AI-AI gameplay. I utilized Minimax and Monte Carlo Tree Search algorithms for gameplay logic. Additionally, I created the graphical interface using the pygame library.

8-Puzzle *Artificial Intelligence*

Search Algorithms *Pyhton*

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

Certifications

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.

Skills

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

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

Graphic Design Tools Photoshop, Blender, Illustrator

Software Engineering Familiar with multiple design patterns.

Soft Skills Creativity, Teamwork, Problem Solving, Social Communication

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

Arabic Familiar