

Mohammad Amin Yousefi

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Education

College of Electric and Computer Engineering, University of Tehran

Tehran, Iran

B.SC. IN COMPUTER ENGINEERING

Sep. 2021 - Present

• Last Two Year GPA: 19.34/20 · CGPA: 19.02/20 · FACULTY AVERAGE: 15.71

- Computer Vision: 20/20
- Artificial Intelligence: 20/20
- Algorithm Design: 19.5/20
- Systems Analysis and Design: 19.6/20

- Neural Networks and Deep Learning: 18.5/20
- Foundations of Data Science: 19.6/20
- Data Structures and Algorithms: 20/20
- Operating Systems: 19.9/20

Research Interests

- Image & Video Processing
- Computational Biology and Genomics
- Generative Models Interpretability and Robustness
- Deep Learning in Computer Vision

Publications

HyCoVAD: A Hybrid SSL-LLM Model for Complex Video Anomaly Detection

M.M. Hemmatyar, M. Jafari, **M.A. Yousefi**, M.R. Nemati, M. Azadani, H.R. Rastad, A.M. Akbari

Submitted to International
Journal of Computer Vision (IJCV)

Can LLMs Faithfully Explain Themselves in Low-Resource Languages? A Case Study on Emotion Detection in Persian

M.A. Yousefi, M. Mehrazar, P. Beygi, B. Bahrak

Submitted to EACL 2026

Research Experience

Self-Supervised Video Anomaly Detection, under the supervision of Dr. M. Jafari

Information, Network, and Learning
(INL) Lab, Sharif University of
Technology

RESEARCH ASSISTANT

Jan 2024 – Oct 2025

Developing a deep hybrid framework that unifies self-supervised video representation learning with high-level reasoning from large language and vision-language models. The core of our design is a multi-proxy self-supervised backbone that learns rich spatiotemporal features for each detected object through diverse auxiliary tasks, such as motion prediction and trajectory modeling. These representations are then processed by an LLM-VLM module that performs semantic reasoning over detected entities and their interactions to validate anomalous events.

GRAVITY: Research Internship at Medical University of Vienna, under the supervision of Dr. S. Megas

Megas-Lab, Medical University of
Vienna

RESEARCH ASSISTANT

May 2025 – Present

Developing GRAVITY, a generative AI framework designed to learn causal links between tissue morphology and genomics by integrating vision foundation models with a theoretically grounded causal model. The approach disentangles multi-modal interactions (e.g., morphology-gene, gene-gene) from spatial transcriptomics and histology data to predict counterfactual outcomes of biological perturbations. This work is currently being prepared for submission to the ICML conference.

Hallucination Detection in Vision-Language Models (VLMs), under the supervision of Prof. M. H. Rohban

Robust and Interpretable Machine
Learning Lab (RIML), Sharif
University of Technology

RESEARCH ASSISTANT

Apr 2024 – Present

Conducting research on detecting and mitigating hallucinations in Vision-Language Models by introducing controlled perturbations to image captions and visual inputs while preserving their semantics. The approach involves analyzing model certainty under these perturbations to identify hallucination patterns. To enhance robustness, hallucination cases are categorized into distinct types—such as object-level and relational hallucinations—enabling more precise detection and evaluation.

3D MRI Image Registration, under the supervision of Prof. B. Moshiri

Medical Image Processing Lab,
University of Waterloo, University of
Tehran

RESEARCH ASSISTANT

Jan 2025 – Present

Developing an advanced image registration method for 3D MRI scans from the OASIS dataset. The approach integrates hierarchical Vision Transformers (ViTs) with masked autoencoders to capture multi-scale anatomical features and achieve precise spatial alignment. The work is being prepared for submission to the CVPR conference.

Large Language Models Self-Explanation, under the supervision of Prof. B. Bahrak

Tehran Institute for Advanced
Studies (TIAS)

RESEARCH ASSISTANT

Jul 2024 – Jan 2025

Investigating the effectiveness of large language models (e.g., ChatGPT) in generating self-explanations for sentiment analysis by comparing pre-prediction and post-prediction explanations. The study evaluates the faithfulness and alignment of these explanations with human judgments. The resulting paper is submitted to EACL2026.

Teaching Experience UNIVERSITY OF TEHRAN

Supervisor	FOUNDATIONS OF DATA SCIENCE, PROF. B.BAHRAK, PROF. Y.YAGHOOBZADE	Feb. 2025 - Sep. 2025
Teaching Assistant	NEURAL NETWORKS AND DEEP LEARNING, PROF. B.BAHRAK	Feb. 2025 - Sep. 2025
Teaching Assistant	ARTIFICIAL INTELLIGENCE, PROF. H.FADAIE, PROF. Y.YAGHOOBZADE	Feb. 2024 - Sep. 2025
Teaching Assistant	ALGORITHM DESIGN, PROF. M.J. DOUSTI, PROF. M.ASADPOOR	Sep. 2023 - Jan. 2025
Teaching Assistant	DATA STRUCTURES AND ALGORITHMS, PROF. H. FAILI	Sep. 2024 - present
Teaching Assistant	ADVANCED PROGRAMMING, PROF. R. KHOSRAVI	Feb. 2023 - Jun. 2024
Teaching Assistant	INTRODUCTION TO COMPUTING SYSTEMS AND PROGRAMMING, PROF. M. HASHEMI	Sep. 2022 - Feb. 2023

Notable Academic Projects

VAE & GAN UNIVERSITY OF TEHRAN
NEURAL NETWORKS AND DEEP LEARNING COURSE FALL 2024

Developed a Triplet Variational Autoencoder (Tri-VAE) for anomaly detection in brain MRIs using reconstruction errors. Implemented AdvGAN to generate adversarial attacks on a ResNet-20 model, evaluating attack success rates and model robustness.

Transformers & ViT UNIVERSITY OF TEHRAN
NEURAL NETWORKS AND DEEP LEARNING COURSE FALL 2024

Developed a robust transformer model for regression using Huber loss to handle noisy data. Implemented a Vision Transformer (ViT) for blood cell classification, comparing fine-tuning strategies against a DenseNet-121 baseline. Applied data augmentation and evaluated performance.

Image Generative Models UNIVERSITY OF TEHRAN
DEEP LEARNING WINTER 2025

Implemented VAE, GAN, C-GAN, DDPM, and C-DDPM from scratch using PyTorch on the Fashion-MNIST dataset. Analyzed and compared model performance, focusing on diffusion models for image synthesis.

Image Segmentation & Object Detection UNIVERSITY OF TEHRAN
NEURAL NETWORKS AND DEEP LEARNING COURSE FALL 2024

Developed a VGG-UNet model for brain tumor segmentation and implemented Faster R-CNN and SSD for road sign detection. Applied transfer learning, data augmentation, and evaluated performance using IoU and mAP.

LSTMs UNIVERSITY OF TEHRAN
NEURAL NETWORKS AND DEEP LEARNING COURSE FALL 2024

Developed a CNN-LSTM model for Persian spam email detection using ParsBERT embeddings, optimizing performance with deep contextual representations. Implemented LSTM, Bi-LSTM, and ARIMA models for crude oil price forecasting, comparing deep learning with traditional time series methods using MAE and RMSE metrics.

Convolutional Neural Networks

UNIVERSITY OF TEHRAN

NEURAL NETWORKS AND DEEP LEARNING COURSE

FALL 2024

Developed a CNN for skin cancer detection using dermoscopic images and evaluated performance with ROC curves and F1-score. Applied transfer learning with NasNet, MobileNetV2, and EfficientNetB6 for bean leaf disease detection, optimizing models through data augmentation and hyperparameter tuning.

Foundations of Data Science Projects

UNIVERSITY OF TEHRAN

FOUNDATIONS OF DATA SCIENCE COURSE

Spring 2024

- Web Scraping & Introductory Data Analysis
- Foundations for Inference
- Preprocessing and Exploratory Data Analysis (EDA)
- Spotify Dataset Analysis
- Loss Functions and Regression
- Feature Engineering Techniques
- Dimensionality Reduction and Unsupervised Learning
- Semi-Supervised Learning and LLMs

Artificial Intelligence Projects

UNIVERSITY OF TEHRAN

ARTIFICIAL INTELLIGENCE COURSE

FALL 2023

- Training a genetic algorithm for curve fitting.
- Reinforcement Learning models trained by Value Iteration, Policy Iteration and Q-Learning
- Sound classification based on MFCC features using HMMs
- Classification and regression using classic ML models including Linear Regression, KNN, Logistic Regression, Decision Trees, and Ensemble Learning
- Brain tumor classification using computer vision techniques including CNNs based on the MRI picture of the patient's brain
- Text clustering and labeling news using K-means and DBSCAN

Skills

Programming Languages	C, C++, C#, Python, Java, Verilog/System Verilog, MATLAB, R, SQL, HTML, CSS, LaTeX
Machine Learning & Data Science Tools	PyTorch, scikit-learn, cv2, Numpy, Pandas, PySpark, Seaborn, Keras, Matplotlib
Technologies	Git, Jupyter Notebook
Databases	MYSQL, MSSQL, PostgreSQL
Operating Systems	Linux (Ubuntu), Microsoft Windows
Soft Skills	Problem-solving, critical thinking, creativity, curiosity, collaboration

Honors & Awards

Jan. 2025	Ranked 5 , Computer Engineering school of University of Tehran with 101 participants	Tehran, Iran
June. 2021	Top 0.01% , Mathematics and Physics University Entrance Exam with more than 150,000 participants and I have been admitted to the Computer Engineering program at the University of Tehran, which is widely regarded as one of the top universities in Iran by US News	Tehran, Iran

Volunteer Activities

Teaching Mathematics

Tehran, Iran

TEACHING

Sep. 2021 - Jan. 2023

Help two groups of students preparing for the international entrance exam in Iran to get better at mathematics.

Languages

Persian	Native
English	Professional working proficiency TOEFL: 112/120 (R:29, L:29, S: 26, W: 28)