Arash NasrEsfahani

Department of Mathematics, Statistics, and Computer Science, University of Tehran, Tehran, Iran

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Research Interests

- Human-Computer Interaction
- Machine Learning
- Data Analysis
- Human-Robot Interaction

Education

University of Tehran *Sep 2024 – Present*
MSc in Computer Science (Artificial Intelligence) – GPA: 19.46/20 (4.0/4.0)

University of Tehran *Sep 2021 – Aug 2024*
BSc in Computer Science

University of Tehran *Sep 2019 – Aug 2021*
BSc in Electrical Engineering (Transferred to Computer Science)

Publications

AI-Driven Relocation Tracking in Dynamic Kitchen Environments 2024
Published in ICCKE 2024: 14th International Conference on Computer and Knowledge Engineering
Arash Nasr Esfahani, Hamed Hosseini, Mehdi Tale Masouleh, Ahmad Kalhor, Hedieh Sajedi

Ensemble of Foundation Models for Sensor-Based Locomotion and Transportation Mode Recognition 2025
Accepted in UbiComp 2025: ACM International Joint Conference on Pervasive and Ubiquitous Computing
Arash Nasr Esfahani, Mohammad Foad Abdi, Yousef Alikhani, Mohammad Mahdi Azizi, Bagher BabaAli, Mehdi Mohhebi

Deep Spatio-Temporal Disambiguation for Scene Rearrangement in Kitchen Environments 2025
Manuscript in preparation for submission to peer-reviewed journals
Arash Nasr Esfahani, Hamed Hosseini, Mehdi Tale Masouleh, Ahmad Kalhor

Experience

The Human and Robot Interaction Lab (TaarLab) *University of Tehran*
Researcher *Sep 2023 – Present*
Under Supervision of: Prof. M. Tale Masouleh
As part of a research team focused on scene understanding and manipulation, I led a project centered on robotic scene rearrangement within dynamic environments using the AI2-THOR simulator. Developed and implemented methods employing temporal frame analysis, integrating Deep-Learning models for object detection and enabling object rearrangement across virtual scenes.

School of Math, Statistics, and Computer Science *University of Tehran*
Researcher *April 2025 – July 2025*
Under Supervision of: Prof. B. Babaali
Collaborated in a five-person team to compete in the SHL 2025 Human Activity Recognition Challenge, hosted by the University of Sussex. My primary role involved employing time series foundation models and implementing advanced data analysis techniques to optimize model performance.

Database Management Systems Course *University of Tehran*
Teaching Assistant *Oct 2023 – Jan 2024*
Instructor: Prof. M. Goodarzi
Contributed to the development of course materials, including homework assignments and projects. Supervised a designated group of students in their final projects, providing guidance on principles of database design.

Honors and Awards

- Ranked 598 among more than 160000 participants in the Nationwide Iranian University Entrance Exam in Mathematics and Physics
- Ranked 96 among more than 2000 participants in the Nationwide Entrance Exam for a Master's Degree in Computer Science
- Advanced to the second round of the Iranian Student Olympiads in Computer Science, Physics, and Persian Literature, an achievement reached by less than 10% of initial participants.

Notable Courses

• **Machine Learning** ***(Graduate)*** 19.41/20
Prof. B. Babaali - Fall 2024

• **Artificial Intelligence** 18.6/20
Prof. H. Sajedi - Fall 2022

• **Graph Theory and Applications** 19/20
Prof. M. Mohammad-Noori - Fall 2022

• **Design and Analysis of Algorithms** 17.85/20
Prof. M. Ganjtabesh - Fall 2022

• **Advanced Algorithms** ***(Graduate)*** 19.51/20
Prof. M. Mohammad-Noori - Fall 2024

• **Machine Language and Assembly** 18/20
Prof. M. Rafiee - Spring 2024

• **Theory of Computation** 19.25/20
Prof. F. Halataei - Fall 2023

• **Game Theory** 18.5/20
Prof. M. Darvishzadeh - Fall 2021

Selected Projects

Deep Learning Framework for Human Activity Recognition | Python, TensorFlow, Keras

Implemented a hybrid CNN–LSTM model with self-attention for wearable sensor-based activity recognition, achieving 95.24% accuracy on UCI-HAR and 98.24% on MHEALTH datasets.

Object Segmentation with U-Net & Seg-Grad-CAM | Python, U-Net, Grad-CAM

Developed a U-Net model for semantic segmentation of horses using the Weizmann Horse Dataset, tested multiple loss functions (Dice, BCE, Focal), achieved 86.11% validation IoU, and visualized model focus areas using Seg-Grad-CAM.

Persian Sentiment Analysis with BERT Variants | Python, Transformers, PyTorch

Fine-tuned ParsBERT and multilingual BERT for sentiment classification on Persian Snappfood reviews, evaluated cross-domain performance on Digikala reviews, with ParsBERT outperforming in all metrics.

N-Gram BiGRU for Multilingual Language Identification | Python, TensorFlow

Designed and compared a character-based baseline and BiGRU model to detect 10 languages, achieving 99.12% accuracy while significantly improving precision and recall over the baseline.

NASM Image Processing System | Assembly, Python

Built a NASM-based image processing utility for tasks like color channel manipulation, resizing, noise generation, and grayscale conversion, ensuring efficient, low-level performance.

Technical Skills

Programming Languages: Python, C/C++, Java, SQL, R, Assembly, HTML/CSS, Verilog, LaTeX

Technologies/Frameworks: Git, Docker, Linux, Tensorflow, Transformers, Sci-kit, PyTorch, Keras, NumPy, Pandas, Matplotlib, Seaborn

Languages

English: Full Professional Proficiency

TOEFL: 109 (R:30, L:30, S:25, W:24)

Persian: Native

German: Elementary Proficiency