Arash NasrEsfahani

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

arashnasresfahani37@gmail.com +98 921 316 9654 ArashNasrEsfahani ArashNasrEsfahani

Research Interests

- Human-Computer Interaction
- Human-Robot Interaction
- Agentic AI
- Explainable AI

Education

University of Tehran *Sep 2024 – Present*
MSc in Computer Science (Artificial Intelligence) – GPA: 19.36/20 (4.0/4.0)

University of Tehran *Sep 2019 – Aug 2024*
BSc in Computer Science – GPA: 15.85/20 (3.12/4.0)

Publications

Embodied AI for Kitchen Scene Rearrangement: A Deep Spatio-Temporal Approach 2026
Published in Intelligent Service Robotics
Arash Nasr Esfahani, Hamed Hosseini, Mehdi Tale Masouleh, Ahmad Kalhor

NeXtSwin-X: Dual-Branch Cross-Attention Fusion of ConvNeXt and Swin Transformer for Accurate Brain Tumor Classification from MRI and CT 2026
Accepted for publication in Scientific Reports
Arash Nasr Esfahani, Amirreza Jalili, Hedieh Sajedi

Ensemble of Foundation Models for Sensor-Based Locomotion and Transportation Mode Recognition 2025
Published in UbiComp Companion 25: Companion of the 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

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

Research & Work Experience

The Human and Robot Interaction Lab (TaarLab) *University of Tehran*
Researcher *Sep 2023 – Present*
Under Supervision of: Prof. M. Tale Masouleh
- Led a project on **robotic scene rearrangement** in dynamic scenes using the **AI2-THOR** simulator.
- Engineered a perception pipeline pairing **YOLOv5 detection** with **temporal frame analysis**.
- Designed **graph-based state detection** and **optimal path planning** for object rearrangement.
- Resulted in **two publications** (ICCKE 2024, *Intelligent Service Robotics* 2026).

KareOne (Business Intelligence Company) *Tehran, Iran*
AI Engineer *Sep 2025 – Present*
- Built the company's main **RAG chatbot** for grounded question-answering over users' own documents.
- Developed **ML company-similarity models** to discover and rank competitors.
- Created **data-analysis tools** that turn numeric and textual data into **business-insight visualizations**.
- Helped shape the company's **AI strategy**, centered on **explainable, interpretable AI**.

Department of Mathematics, Statistics, and Computer Science *University of Tehran*
Researcher *April 2025 – July 2025*
Under supervision of: Prof. B. Babaali
- Selected for the **University of Tehran team** in the **SHL 2025 HAR Challenge** (Univ. of Sussex).
- Won **1st place**, presented at **UbiComp 2025**.
- Combined **three time-series foundation models** (BIOT, CBraMod, MOMENT) with a learned MLP arbiter.
- Resolved a **cross-user distribution mismatch** that was hurting generalization across users.

Related Course Projects

HRAG-Bot, a Personalized Hierarchical RAG Agent | **Python, ChromaDB, Neo4j, FastAPI**
- A personal assistant over a user's own documents with **hierarchical (taxonomy + knowledge-graph) retrieval**, growing **per-user memory**, and an **agentic deep-read** mode for structural questions.

Object Rearrangement in Dynamic Environments | **Python, YOLOv5, AI2-THOR**
- A robotic system that **detects, navigates to, and rearranges objects** in dynamic simulated scenes through detection and task planning.

Kidney Stone Detection & Segmentation | **Python, YOLOv10, SegFormer**
- A **two-stage medical-imaging framework** that first detects and then segments kidney stones in CT scans.

Persian Receipt OCR Pipeline | **Python, YOLOv8, TrOCR**
- A **multi-task OCR pipeline** that localizes and reads fields from Persian receipts via detection and transformer-based recognition.

Object Segmentation with U-Net & Seg-Grad-CAM | **Python, U-Net, Grad-CAM**
- **Interpretable semantic segmentation** with a U-Net, explained via **Seg-Grad-CAM**.

Deep Learning Framework for Human Activity Recognition | **Python, TensorFlow, Keras**
- A **hybrid CNN–LSTM model with self-attention** for wearable sensor-based human activity recognition.

Selected Courses

- **Machine Learning**⋆ 19.41/20
  Prof. B. Babaali - Fall 2024
- **Advanced Algorithms**⋆ 19.51/20
  Prof. M. Mohammad-Noori - Fall 2024
- **Artificial Intelligence** 18.6/20
  Prof. H. Sajedi - Fall 2022
- **Graph Theory and Applications** 19/20
  Prof. M. Mohammad-Noori - Fall 2022
- **Digital Image Processing**⋆ 20/20
  Prof. H. Sajedi - Spring 2023
- **Natural Language Processing**⋆ 19.4/20
  Prof. B. Babaali - Spring 2024

Teaching

- **Digital Image Processing**⋆
  Teaching Assistant, Prof. H. Sajedi - Spring 2026
  Designed homework assignments and oversaw students' course projects.
- **Database Management Systems**
  Teaching Assistant, Prof. M. Goodarzi - Fall 2023
  Developed course materials and supervised final projects on 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.

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

⋆Graduate-level course