Mohammad Reza Shafie

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Research Interests

- Robotics
- Image and Video Processing
- Computer Vision
- Autonomous Vehicles
- Pattern Recognition
- Deep Learning

Education

Iran University of Science & Technology, M.Sc. in Electrical Engineering — Oct 2021 – Aug 2023

- **Fifth Rank** in a class of **56** graduates, achieving a **GPA** of **18.44/20 (4/4)**
- **Thesis:** Age-invariant Face Recognition, employing continuous domain adoption and face age synthesis to minimize the impact of age variation on face recognition

Iran University of Science & Technology, B.Sc. in Electrical Engineering — Oct 2017 – Sep 2021

- **Second Rank** in a class of **37** graduates, achieving a **GPA** of **17.74/20 (3.77/4)**
- **Thesis:** Designing and Implementing Image Steganography model using Convolutional Neural Network on FPGA

Work Experience

AI Robotics Engineer, Octa Startup Accelerator – Tehran, Iran — Aug 2023 – Present

- Developed and optimized **template matching** algorithms for real-time object recognition and tracking in video.
- Applied **optical flow** methods and **sensor fusion** techniques (IMU, LiDAR, and cameras) to enhance motion analysis and system performance in real-world environments.
- Leveraged **digital signal processing** and **image processing** techniques on **Jetson Orin series** for high-performance, low-latency embedded system operations.
- Familiar with **ROS (Robot Operating System)** for developing and simulating robotic perception pipelines in virtual environments.
- Experienced in working with **Jetson series**, **Raspberry Pi 4 & 5**, **Orange Pi**, and developing AI vision applications on **ARM64-based Linux** platforms for embedded systems.
- Worked with **VPI (Vision Programming Interface)** of **NVIDIA** for optimized computer vision workflows, enhancing real-time processing.
- Utilized **Python** for scripting, automation, and data analysis to ensure system scalability and flexibility.
- Collaborated effectively within a development team using **Git** for version control and project coordination.

Co-founder, Atlas Artificial Intelligence – Tehran, Iran — April 2022 – Present

- Developing an intelligent referee AI system using **human pose estimation** to count and assess the correctness of athletes' movements with a high degree of accuracy. More details SmarRefree in my Personal Page.
- Developing a smart face verification, tracking, and age estimator system using **deep learning** methods to track salespeople of a store and estimate customer ages. More details SmartCommute in my Personal Page.

Selected Courses

- **Statistical Pattern Recognition** — 4/4
- **Medical Image Processing** — 4/4
- **Smart Systems Design (Deep Learning and Optimization Algorithms)** — 4/4
- **Machine Vision** — 4/4
- **Machine Learning Specialization**, Stanford University (Coursera) — 95/100
- **Deep Learning Specialization (5 Courses)**, DeepLearning.AI (Coursera) — 93/100
- **Generative Adversarial Networks Specialization**, DeepLearning.AI (Coursera) — 97/100
- **Deep Neural Networks with PyTorch**, IBM (Coursera) — 91/100
- **Applied Machine Learning in Python**, University of Michigan (Coursera) — 94/100

Publications

KANGURA:Kolmogorov-Arnold Network-Based Geometry-Aware Learning with Unified Representation Attention for 3D Modeling of Complex Structures in Advanced Manufacturing May 2025
Mohammad Reza Shafie, Morteza Hajiabadi, Hamed Khosravi, Dr. Imtiaz Ahmed
Under preparation (Link to draft)

LNUCB-TA: Linear-nonlinear Hybrid Bandit Learning with Temporal Attention March 2025
Hamed Khosravi, Mohammad Reza Shafie, Ahmed Shoyeb Raihan, Dr. Srinjoy Das, Dr. Imtiaz Ahmed
Submitted to Journal of Machine Learning (Link to paper)

A cluster-based human resources analytics for predicting employee turnover using optimized Artificial Neural Networks and data augmentation Apr 2024
Mohammad Reza Shafie, Hamed Khosravi, Sarah Farhadpour, Dr. Srinjoy Das, Dr. Imtiaz Ahmed
Link to paper

Optimizing Forest Fire Prediction: A Comparative Analysis of Machine Learning Models through Feature Selection and Time-Stage Evaluation Dec 2023
Hamed Khosravi, Mohammad Reza Shafie, Dr. Imtiaz Ahmed
Link to paper

Chatbots and ChatGPT: A Bibliometric Analysis and Systematic Review of Publications in Web of Science and Scopus Databases Apr 2023
Hamed Khosravi, Mohammad Reza Shafie, Morteza Hajiabadi, Ahmed Shoyeb Raihan, Dr. Imtiaz Ahmed
Link to paper

Awards & Honors

- Being finalist for the Manufacturing AI Competition (2024). Announcement
- Ranked **672nd** among approximately **150,000** participants in the National Entrance Exam for Iranian Universities (2017).
- Graduated with rank **2** among **35** students of Eelctronics field and rank **5** among **127** entrants in Electrical engineering in Iran University of Science & Technology (2021). Rank Certificates
- Exempted from Iran's Universities Entrance Exam for Master's Degree at Iran University of Science & Technology (2021).
- Winner of the "Financial Educational Reward" from Iran's National Elites Foundation, Iran University of Science and Technology, Iran (2020, 2021).
- Government Tuition-fee scholarship for B.Sc. and M.Sc degrees (2017 - 2021, 2021 - 2023)

Projects

3D reconstruction application Project Demo

- Contributed as a team member to a real-time system that utilized image and video feeds to dynamically create 3D models. (Funded project for Iran Broadcasting)
- Tools Used: Python, C++, Nerf, ECON, Meshroom, Avatar

SmartRefree Project Demo

- Developed as part of the **Atlas AI team**, this intelligent referee system employs pose estimation deep learning models and geometry-based calculations to assess the correctness of athletes' movements. (Funded project for Traditional Sports Federation of Iran)
- Tools Used: Python, C++, MediaPipe

Improving Road Semantic Segmentation using Deep Convolutional Generative Adversarial Network (Course project) Repository

High-Capacity Image Steganography using Fully-Convolutional DenseNet (Course project) Repository

Test Scores

GRE: Verbal Reasoning: **158**, Quantitative Reasoning:**166**, Overall: **324** Oct 2022

TOEFL: Reading: **30**, Listening: **29**, Speaking: **24**, Writing: **25**, Overall: **108** May 2025

Technical Skills

- **Programming Languages & Python Libraries:** Python, Bash, basic knowledge of C++ (building, running, and debugging), PyTorch, Kornia, OpenCV (cv2), Pandas, NumPy, Ray
- **Embedded Systems:** Sensor Driving & Integration (IMU, LiDAR, Barometer, OAK-D pro), Embedded Systems Programming (Raspberry Pi, Jetson series, different types of Microcontrollers)
- **Tools and Frameworks:** Linux, ROS, Git, LaTeX
- **Networking and Communication Protocols:** MAVLink, basic knowledge of (FFmpeg, and V4L2), RTSP

Teaching Experience

Teaching Assistant at Iran University of Science & Technology Oct 2022 - Dec 2022

- **Instructor & Course:** Dr. Mirzakochaki & Advanced Logic

Teaching Assistant at Iran University of Science & Technology Oct 2021 - Dec 2021

- **Instructor & Course:** Dr. Mirzakochaki & Digital Systems

References

- **Prof. Sattar Mirzakuchaki**
  Department of Electrical Engineering, Iran University of Science and Technology, Tehran, Iran
  Email: m_kuchaki@iust.ac.ir
- **Prof. Imtiaz Ahmed**
  Department of Industrial and Management Systems Engineering, West Virginia University, WV, US
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