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
- **Ranked 5th** 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
- **Ranked 2nd** in a class of **37** graduates, achieving a **GPA** of **17.74/20 (3.77/4)**
- **Thesis:** Image Steganography using Convolutional Neural Network

Work Experience

AI Robotics Engineer, Octa Startup Accelerator – Tehran, Iran   Aug 2023 – Present
- **Real-time object tracking:** Template matching, optical flow
- **Sensor fusion:** IMU, LiDAR range finder, camera integration
- **Embedded AI:** Jetson Orin, Raspberry Pi, Orange Pi, ARM64-based Linux
- **High-performance processing:** Digital signal processing, image processing
- **Optimized vision pipeline:** NVIDIA VPI (Vision Programming Interface)
- **Programming:** Python for scripting, automation, and data analysis
- **Robotics middleware:** ROS (used for simulation and system-level testing)
- **Version control:** Git for collaborative development

Co-founder, Atlas Artificial Intelligence – Tehran, Iran   April 2022 – Present
- **Pose estimation system:** Athlete movement counting and correctness assessment (SmartRefree) [More Info](#)
- **Face analytics system:** Real-time face verification, tracking, and age estimation for retail analytics (SmartCommute) [More Info](#)

Selected Courses

- **Statistical Pattern Recognition** — 19.79/20
- **Medical Image Processing** — 19.8/20
- **Smart Systems Design (Deep Learning and Optimization Algorithms)** — 17.5/20
- **Machine Vision** — 18.5/20
- **Linear Control Systems** — 19/20
- **Machine Learning Specialization (3 Courses)**, Stanford University (Coursera) — 95/100
- **Deep Learning Specialization (5 Courses)**, DeepLearning.AI (Coursera) — 93/100
- **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 **672**nd out of approximately **150,000** participants in the National University Entrance Exam (Iran, 2017)
- Graduated with rank **2** among **35** students of Eelctronics field and rank **5** among **127** entrants in Electrical engineering at IUST (2021). [Rank Certificates](#)
- Exempted from Iran's Universities Entrance Exam for Master's Degree at IUST (2021).
- Winner of the "Financial Educational Reward" from Iran's National Elites Foundation, IUST (2020, 2021).
- Government Tuition-fee scholarship for B.Sc. and M.Sc degrees (2017 - 2021, 2021 - 2023)

Projects

3D reconstruction application [Project Demo](#)

- **3D reconstruction system:** Real-time modeling from image and video (team project; funded by Iran Broadcasting)
- Tools Used: Python, C++, Nerf, ECON, Meshroom, Avatar

SmartRefree [Project Demo](#)

- **Pose-based referee system**: Deep learning and geometry-based movement assessment (Atlas AI; funded by Traditional Sports Federation of Iran)
- Tools Used: Python, C++, MediaPipe

Bird's-Eye-View Panoptic Segmentation Using Monocular Frontal View Images (Paper presentation for course project)

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 range finder, Barometer, OAK-D pro), Embedded Systems Programming (Jetson series, Raspberry Pi, different types of Microcontrollers)
- **Tools and Frameworks:** Linux, ROS, Git, LaTeX
- **Networking and Communication Protocols:** MAVLink, basic knowledge of (FFmpeg, and V4L2), RTSP

Soft Skills

- **Problem-solving mindset with adaptability in resolving cross-functional challenges**
- **High-pressure problem-solving to meet critical experimental or project deadlines**
- **System documentation and reporting**
- **Technical coordination and integration across modules**

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
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- **Prof. Imtiaz Ahmed**
  Department of Industrial and Management Systems Engineering, West Virginia University, WV, US
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  School of Mathematical and Data Sciences, West Virginia University, WV, US
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