

Amirhossein Kazerouni

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Education

Iran University of Science and Technology (IUST)

Tehran, Iran

B.S. IN ELECTRICAL ENGINEERING

Sep. 2017 - Feb. 2022

- **GPA:** 17.95/20 (3.85/4)
- **Thesis topic:** Design, Simulation, and Construction of an Autonomous Vehicle with Environment Perception, Planning, and Control Capabilities. (Thesis Grade: 20/20) — **Supervisor:** Dr. Saeed Shamaghdari, associate professor at IUST

Publications

1. Moein Heidari*, Amirhossein Kazerouni*, Milad Soltany*, Reza Azad, Ehsan Khodapanah Aghdam, Julien Cohen-Adad, and Dorit Merhof (2023). **HiFormer: Hierarchical multi-scale representations using transformers for medical image segmentation**. In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pages 6202–6212 ([Paper](#), [GitHub](#))
2. Amirhossein Kazerouni, Amirhossein Heydarian, Milad Soltany, Aida Mohammadshahi, Abbas Omid, and Saeed Ebadollahi (2022). **An Intelligent Modular Real-Time Vision-Based System for Environment Perception**. *Accepted in NeurIPS 2022 Workshop on Machine Learning for Autonomous Driving* ([Paper](#), [GitHub](#), [Workshop Page](#))
3. Amirhossein Kazerouni, Ehsan Khodapanah Aghdam, Moein Heidari, Reza Azad, Mohsen Fayyaz, Ilker Hacihaliloglu, and Dorit Merhof (2023). **Diffusion models in medical imaging: A comprehensive survey**. *Accepted in Medical Image Analysis Journal*, page 102846 ([Paper](#), [GitHub](#))
4. Sanaz Karimijafarbigloo, Reza Azad, Amirhossein Kazerouni, and Dorit Merhof (2023a). **MMCFFormer: Missing Modality Compensation Transformer for Brain Tumor Segmentation**. *Accepted in MIDL 2023 Conference* ([Paper](#))
5. Sanaz Karimijafarbigloo, Reza Azad, Amirhossein Kazerouni, and Dorit Merhof (2023b). **MS-Former: Multi-scale Self-guided Transformer for Medical Image Segmentation**. *Accepted in MIDL 2023 Conference* ([Paper](#))
6. Reza Azad, Amirhossein Kazerouni, Moein Heidari, Ehsan Khodapanah Aghdam, Amirali Molaei, Yiwei Jia, Abin Jose, Rijo Roy, and Dorit Merhof (2023b). **Advances in Medical Image Analysis with Vision Transformers: A Comprehensive Review**. *Submitted to Medical Image Analysis Journal* ([Paper](#), [GitHub](#))
7. Reza Azad, Rene Arimond, Ehsan Khodapanah Aghdam, Amirhossein Kazerouni, and Dorit Merhof (2023a). **DAE-Former: Dual Attention-guided Efficient Transformer for Medical Image Segmentation**. *arXiv preprint arXiv:2212.13504* ([Paper](#), [GitHub](#))
8. Milad Soltany Kadarvish*, Hesam Mojtahedi*, Hossein Entezari Zarch*, Amirhossein Kazerouni*, Alireza Morsali, Azra Abtahi, and Farokh Marvasti (2021). **Ensemble Neural Representation Networks**. *Submitted to Neural Processing Letters Journal* ([Paper](#), [GitHub](#))

* denotes equal contribution.

Research Interests

- Computer Vision
- Medical Image Analysis
- Deep Learning
- Diffusion Models
- Machine Learning
- Transformers
- Computer Graphics
- Autonomous Driving

Honors & Awards

2022	Ranked 3rd among 41 students who chose Control as a subfield	IUST, Iran
2022	Ranked 4th among 127 Electrical Engineering students	IUST, Iran
2021	Ranked 1st team in the national Rahnesan competitions for autonomous vehicles	INEF, Iran
2021	Ranked 2nd team in FIRA World Cup Competitions in Autonomous Cars League	FIRA, Iran
2015	Ranked 1st team in the A-lympiad National Mathematical Competition	Iran
2016	Hold a diploma from the A-lympiad World Mathematical Competition	Utrecht University, Netherlands
2017	Ranked within the top 1% among approximately 148,000 participants in the National University Entrance Exam	Iran

Skills

Programming	Python, MATLAB, C/C++, Latex, Familiar with HTML, CSS, PHP
AI Tools/ Libraries	PyTorch, TensorFlow, OpenCV, NPM (NumPy - Pandas - Matplotlib), etc.
Tools	Linux, Git

Research Experience

Remote Research Assistant

Aachen, Germany

RWTH AACHEN UNIVERSITY — SUPERVISOR: PROF. DORIT MERHOF AND REZA AZAD

2022 - Present

- Worked on Transformers and Diffusion models, which resulted in four conference papers and two survey papers.

Machine Learning and Computer Vision Researcher

Montreal, Canada

DGSCULPTOR

2021 - Present

- Worked on the "Ensemble Neural Representation Networks" paper and proposed a novel suboptimal ensemble architecture for Implicit Neural Representation (INR).
- Currently, I am working on using Transformers for Super-Resolution.

AI Researcher

IUST, Iran

AI AND CONTROL LAB — SUPERVISOR: PROF. SAEED SHAMAGHDARI

2019 - 2021

- Worked on "Fusion-Based 3D Shape Analysis in a Noisy Environment" project.

Computer vision Researcher

Tehran, Iran

IRAN'S NATIONAL ELITES FOUNDATION, UNIVERSITY OF TEHRAN — SUPERVISOR: PROF. MOHAMMAD ALI AKHAEI, ASSOCIATE

2019 - 2020

PROFESSOR AT THE UNIVERSITY OF TEHRAN

- Worked on "Statistical and Semantic Analysis of Football Game" project.

Teaching Experience

Teaching Assistant of "Principles of Mechatronics"

IUST, Iran

INSTRUCTOR: PROF. SAEED SHAMAGHDARI

Spring 2021

Working Experience

CEO and Co-founder

IUST, Iran

AIR (ARTIFICIAL INTELLIGENCE AND ROBOTICS) CENTER

2020 - 2022

- Teaching and mentoring Deep Learning, Machine Learning, and Python courses.

Major Projects

Automatic Parallel Parking ([Link](#), [GitHub](#))

INEF, Iran

NATIONAL RAHNESHAN COMPETITIONS

2021

- Implemented a parallel parking system that includes path planning, path tracking, and parallel parking.

Statistical and Semantic Analysis of Football Game ([Link](#), [GitHub](#), [Website](#))

INEF, Iran

SUPERVISOR: PROF. MOHAMMAD ALI AKHAEI

2019 - 2020

- Created the bird's eye view of the soccer field by predicting the homography matrix using GANs.
- Created a Telegram bot with PHP to collect voice data to create a voice spotting dataset.

Fusion-Based 3D Shape Analysis in a Noisy Environment Using Stereo Camera ([Link](#))

IUST, Iran

SUPERVISOR: PROF. SAEED SHAMAGHDARI

2019 - 2021

- Proposed a fusion-based multi-stage approach that performs 3D shape analysis on vehicles to measure the amount of load protrusion.

Design, Simulation, and Construction of an Autonomous Vehicle with Environment Perception, Planning, and Control Capabilities ([Link](#))

IUST, Iran

SUPERVISOR: PROF. SAEED SHAMAGHDARI

Sep. 2021

- Designed and built a toy self-driving car from scratch.

Autonomous Car Simulation Based on AVIS Engine ([Link](#), [GitHub](#))

FIRA, Iran

FIRA WORLD CUP COMPETITIONS

Summer 2021

- Developed an autonomous car having control and environment perception capabilities.

Persian-OCR ([Link](#), [GitHub](#))

Iran

PERSONAL PROJECT

Mar. 2021 - Jun. 2021

- Developed software in Python that lets you label your desired language words with AI.

Languages

English IELTS (Academic): (Listening: 8, Reading:7, Speaking:6.5, Writing:6.5, **Overall:7**), **C1 Proficiency**

Persian Native