Amirhossein Kazerouni

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Curious and intuitive Researcher with a passion for Computer Vision, Machine Learning, and Deep Learning. My main objective is to study in the field of Artificial Intelligence in a higher-level educational environment towards the Ph.D. degree for a fruitful lifetime career in research and study.

Education

2016-09 **Bachelor of Science: Electrical Engineering (Control Engineering)**
2022-01 *Iran University of Science and Technology (IUST)- Tehran*

- **GPA:** 17.89 (3.85/4)
- **Thesis topic:** Design, Simulation, And Construction of An Autonomous Vehicle with Environment Perception, Planning, and Control Capabilities. **(Thesis Grade: 20/20)** Under the Supervision of Dr. Saeid Shamaghdari, Assistant Professor at Iran University of Science and Technology

Publications

Kadarvish*, M. S. Mojtahedi*, H. Zarch*, H. E. Kazerouni*, A. Morsali, A. Abtahi, A. and Marvasti, F. "Ensemble neural representation networks." Manuscript submitted for publication. 2021. arXiv
** These authors contributed equally.*

Research Interests

- Implicit Neural Representations
- Machine Learning
- Computer Vision
- GANs
- Deep Learning

Honors and Awards

- Ranked as the **3rd** top student among 41 students of Control Engineering, IUST, Iran
- Ranked as the **4th** top student among 127 students of Electrical Engineering, IUST, Iran
- Ranked **1st** Team in the National Rahneshan Competitions for Autonomous Vehicles, Iran's National Elites Foundation, Jan 2021
- Ranked **2nd** Team in FIRA Competitions in Autonomous Cars League (Race Section), Federation of International Robot-soccer Association, Aug 2021
- Ranked **3rd** Team in FIRA Competitions in Autonomous Cars League (Urban Section), Federation of International Robot-soccer Association, Aug 2021
- My teammates and I became **one of the top two teams** in the A-lympiad national math competition and represented the Iranian national team in the **A-lympiad world math contest in the Netherlands**, Utrecht University, Freudenthal Institute, March 2015
- Ranked within the top 1% among approximately 148,000 participants in the National University Entrance Exam, Iran, Summer 2016

Research Experience

2021-03 Current **Machine Learning and Computer Vision Researcher at DGSculptor**

www.dgsculptor.com, Montreal, Canada

- Worked on the **"Ensemble Neural Representation Networks"** paper under the supervision of Dr. Farokh Marvasti, Full professor of Electrical Engineering at the Sharif University of Technology.

2019-09 2020-12 **AI Researcher at AI and Control Lab**

IUST, Tehran

Supervisor: *Dr. Saeid Shamaghdari, Assistant Professor at Iran University of Science and Technology*

2019-12 2020-09 **Computer vision Researcher at the University of Tehran**

Tehran

Supervisor: *Dr. Mohammad Ali Akhaee, Associate Professor at the University of Tehran*

Teaching Experience

2021-02 2021-07 **Teaching Assistant at Iran University of Science and Technology**

- Principles of Mechatronics

2020-07 Current **Co-founder and Mentor at AIR (Artificial Intelligence and Robotics) Center**

AIR center is a research-based team located in IUST. Our chief objectives are teaching and mentoring students in the AI field.

Mentored Coursed:

- Introduction to Deep Learning Course
- Zero to Hero Data Science and Machine Learning Course
- Zero to Hero Python Bootcamp

Major Projects

2021-03 Current **Persian-OCR**

Since there is no appropriate Persian OCR, we (FourGeeks Team) tended to create one. First, we needed to develop proper data tools. This project includes three data tools for OCR: **Data Generation**, **Data Labeling**, and **TextMe**. In this project, I have coded TextMe in Python. TextMe is under-constructed software that lets you label your Persian or any language words. It gives you a chance to upload your PDF file, and by its AI, it would detect all of the words in the PDF and create an image for each of them. In the following, we want to do this procedure automatically, where by labeling the right amount of data, the rest would be done by AI.

2021-09 **Design, Simulation, And Construction of An Autonomous Vehicle with Environment Perception, Planning, and Control Capabilities.**

Supervisor: *Dr. Saeid Shamaghdari, Assistant Professor at Iran University of Science and Technology*

This project included building a toy self-driving car from scratch. Our project comprised three main stages: Completing an Urban Track, Completing a Race Track, Parallel Parking. Various deep learning and classical methods were used to achieve these tasks. This thesis acquired a full mark.

2021-01 **Autonomous Car Simulation Based on AVIS Engine**

2021-06 *FIRA Self-Driving Cars World Cup 2021*

This competition was composed of 2 stages: **Race competition**, **Urban competition**
For both, we utilized computer vision and control methods to keep the car in the right lane and create correct path planning decisions. Furthermore, the use of behavioral cloning in the research and development process has also been investigated.

2019-09 **Unauthorized Load Detection with Stereo Camera**

2020-12 ***Supervisor:*** *Dr. Saeid Shamaghdari, Assistant Professor at Iran University of Science and Technology*

In this project, our team worked on the detection and statistical analysis of cars and trucks driving on a highway. We used a stereo camera for this purpose, firstly, the vehicles are detected, then the vehicle and its load are segmented using Fusion-Net. Afterward, the left and right images from the camera were used to create a point cloud of the whole system, after denoising the data, a dynamic wire-frame is fitted to the vehicle, and after several statistical refinements, it's decided whether the load on the car is physically legal or non-legal.

2019-12 **Statistical and Semantic Analysis of Football Game**

2020-09 ***Supervisor:*** *Dr. Mohammad Ali Akhaee, Associate Professor at the University of Tehran*

- Worked on object detection, tracking, and creating a bird's eye view of the football field regardless of the camera angle.
- Created a dataset for 9 football events with web scraping.
- Created a Telegram bot to collect voice data to create a voice spotting dataset.

Software Skills

- **Programming Languages**
  - Python
  - MATLAB
  - C/C++
- **AI Tools/Libraries**
  - PyTorch
  - OpenCV
  - TensorFlow
  - NPM (Numpy - Pandas - Matplotlib)
- **Others**
  - Web scraping
  - Linux
  - Latex
  - Git

References

- **Dr. Farokh Marvasti**
  Full Professor at the Sharif University of Technology, Tehran, Iran
  Director of Advanced Communications Research Institute
  Email: marvasti@sharif.edu

- **Dr. Saeid Shamaghdari**
  Assistant Professor at Iran University of Science and Technology, Tehran, Iran
  Director of AI and Control Lab, Iran University of Science and Technology
  Email: shamaghdari@iust.ac.ir

- **Dr. Alireza Morsali**
  Research Associate at McGill University, Montreal, Canada
  Email: alireza.morsali@mail.mcgill.ca

Languages

Farsi (Native)

English (My IELTS result will be announced on the 22nd of October)

Certifications

GANs Specialization, Coursera

Introduction to Self-Driving Cars, Coursera

Deep Learning A-Z™: Hands-On Artificial Neural Networks, Udemy

Neural Networks and Deep Learning, Coursera

Computer Vision Course, Human and Robot Interaction Lab., University of Tehran

Get a score of 100 out of 100 in the C++ course, Tehran Institute of Technology

Hobbies and Interests

- Playing Soccer
- Playing Table Tennis
- Surfing Webpages
- Watching movies
- Listening music
- Swimming