Amirhossein Kazerouni

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I am a 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 graduate degree for a fruitful lifetime career in research and study.

Education

2017-09
2022-02

Bachelor of Science: Electrical Engineering (Control Engineering)

Iran University of Science and Technology (IUST) – Tehran

Among the top 4 universities in Iran based on QS

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

Publications

M. Soltany Kadarvish*, H. Mojtahedi*, H. Entezari Zarch*, **A. Kazerouni***, A. Morsali, A. Abtahi, and F. Marvasti, "Ensemble neural representation networks." It is under review in the ICASSP 2022. arXiv

** These authors contributed equally.*

Research Interests

- Artificial Intelligence
- Machine Learning
- Computer Vision
- Computer Graphics
- Deep Learning
- GANs

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 World Cup Competitions in Autonomous Cars League (Race Section), Federation of International Robot-soccer Association, Aug 2021
- Ranked **3rd** Team in FIRA World Cup Competitions in Autonomous Cars League (Urban Section), Federation of International Robot-soccer Association, Aug 2021
- Ranked **1st** team in the **A-lympiad National Mathematical Competition**, Iran, November 2015
- Holds a **diploma** from the **A-lympiad World Mathematical Competition**, Netherlands, Utrecht University, Freudenthal Institute for Science and Mathematics Education, March 2016
- Ranked within the top 1% among approximately 148,000 participants in the National University Entrance Exam, Iran, Summer 2017

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 and proposed a novel suboptimal ensemble architecture for Implicit Neural Representation (INR).

2019-09 – 2021-07

AI Researcher at AI and Control Lab

IUST, Tehran

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

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

2019-12 – 2020-09

Computer vision Researcher at the University of Tehran

UT, Tehran

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

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

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 Courses:

- 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 (Defended) **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. This thesis acquired a full mark.

2021-01 – 2021-06 **Autonomous Car Simulation Based on AVIS Engine**

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 – 2020-12 **Fusion-Based 3D Shape Analysis in a Noisy Environment**

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

My team and I proposed a fusion-based multi-stage approach that performs 3D shape analysis on an object within a noisy environment using a commercial stereo camera that has a short baseline. The first stage uses convolutional neural networks (CNNs) to extract the object from a crowded scene. A weighted optimization method is used in the second stage to fit the deformable wireframe and estimate its 3D pose. The estimated 3D structure is used for shape analysis and measuring the amount of carload protrusion. We evaluated our method on a rough and noisy dataset gathered from a crowded highway and achieved impressive results.

2019-12 – 2020-09 **Statistical and Semantic Analysis of Football Game**

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 changes.
- Created a dataset for 9 football events with web scraping.
- Created a Telegram bot with PHP 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
  - Familiar with HTML, CSS, PHP

Languages

Farsi (Native)

English **(IELTS Overall: 7)**

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, Jan 2018

Hobbies and Interests

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