REZA KARBASI

AI Software Engineer

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SUMMARY

AI Software Engineer with 4+ years of experience developing AI solutions across robotics, computer vision, and Speech signal processing. Master's in AI and Robotics. Proficient in **Python** and **C/C++**. Contributed to open source projects like [DeepFace](#). Adept at collaborating in multidisciplinary and international teams.

WORK EXPERIENCE

Automotive Software Engineer *SoftwareMotion*

04/2023 - Now *Remote, China*

- Made a **CI/CD** pipeline in **Gitlab** with **GTest** for the Autosar-based codebase, reducing on-field testing through automated unit and integration tests by 30%
- Built a **PyQT** visualization software for AEB and ACC systems, integrating BEV plots to drastically reduce debugging time. Processed MF4 and CAN signals (BLF, DBC) to expedite vehicle issue diagnosis.

Machine Learning Engineer *Hara AI Company*

06/2022 - 03/2023 *Tehran, Iran*

- Automated audio file categorization by gender and age using Google's [YamNet](#) (in the **TensorFlow** framework) as the backbone, fine-tuning the model with the company's labeled data. Developed a custom metric to accurately evaluate classification accuracy, with equal emphasis on precision and recall.
- Deployed **MLflow** to facilitate experiment tracking.
- Conducted an in-depth assessment and visualization of the company's Speech-to-Text (**STT**) models under varied real-world conditions (such as noise and reverbation) to pinpoint vulnerabilities.

AI Engineer *Iran's National Elites Foundation*

10/2022 - 12/2023 *Tehran, Iran*

Leading a team, we developed a microservice-based platform for aerial vehicle monitoring, focusing on a graph-based path planning module. By implementing advanced algorithms like Dynamic Programming and A*, we enhanced navigation precision and system responsiveness, achieving a tenfold increase in processing speed over the initial version.

Robotic Researcher *KN2C Robotic Lab*

05/2015 - 09/2017 *Tehran, Iran*

- Boosted ball detection precision by implementing a **Kalman Filter** in **C++**, leveraging the Armadillo library.
- Crafted a real-time GUI in C# using Visual Studio for simultaneous condition monitoring of all robots, enhancing strategic decision-making.

Designer of a Trader Bot *QDM*

04/2019 - 01/2020 *Tehran, Iran*

Engineered a Metatrader trading bot with a technical strategy, incorporating a **Deep Q Network** in **PyTorch**. Utilized a socket connection for data streaming and applied the algorithm on historical data spanning 2007-2019 in Metatrader. Documented a version on this [Medium blog](#) and this [Github repo](#).

Instructor *Aras Academy*

06/2021 - 09/2021 *Tehran, Iran*

Presented **an Introduction to Reinforcement Learning** at Aras Academy's 2021 summer school, basing the syllabus on Sutton's book, "Reinforcement Learning: An Introduction."

NOTABLE PROJECTS

- Dockerized a **face recognition system** in videos using **Flask** and **deepface** library for identifying individuals by comparing faces with reference images, handling video processing, face embedding, matching, and output generation for applications like surveillance. Project link.

- Led the web crawling of the Soroush app for the Big Data Course's final project, utilizing **Selenium** for data extraction and **Kafka** for transmission. Facilitated team collaboration for data analysis, with all contributions and code housed in our GitHub repository.

- Localized Anki robot in a **Gazebo** environment using **particle filter** and **EKF** algorithms.

- Led sentiment analysis of mobile phone reviews on Digikala for a Social Network course project, developing a metric to quantify device opinions. Spearheaded website crawling with **Selenium** and crafted the analysis network. Code available in this repository.

- Implemented an Adaptive Neuro-Fuzzy Inference System (**ANFIS**) algorithm in **Pytorch** for EEG signal classification, facilitating video game control through brain activity.

- Developed a gym environment with a Deep RL **A3C** agent to optimize station power settings and maximize coverage area while minimizing conflicts.

- Conducted a comprehensive data analysis on surgical outcomes for various medical centers and procedures. Assessed performance, compared surgery types, and provided insights to enhance medical service quality.

HONORS & CERTIFICATES

Iran Open RoboCup: Ranked 5th in 2016's Small Sized League (SSL)
Snake League: Ranked 3rd in 2019's Snake League in Nasir Cup
Certificate in Database Principles and SQL Server: Link to the certificate
Certificate in Django Web Framework: Link to the certificate

SKILLS

Programming C++(Advanced), Python(Advanced), C(Advanced), Matlab(familiar), Java(Intermediate)
Frameworks Pytorch(Advanced), Tensorflow(Advanced), MLflow(Intermediate)
Libraries Numpy, Pandas, Matplotlib, Plotly, Selenium, OpenCV
Databases SQL, InfluxDB, MongoDB
Misc Git, Linux, Docker, Software Testing, GTest , Bash Scripting, REST API, Confluence, Jira

EDUCATION

MSc. in AI and Robotics	Tehran University	GPA: 18.8/20	2019-2022
BSc. in Electrical Engineering	Khaje Nasir University	GPA: 17.4/20	2014-2019