

REZA KARBASI

Robotic Software Engineer

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SUMMARY

Robotics Software Engineer with 4+ years of experience in developing software and designing AI solutions for real-world problems. Holds a master's degree in AI and Robotics, and boasts proficiency in programming with Python and C. Experienced in collaborating with diverse teams, both academic and international.

WORK EXPERIENCE

Automotive Software Engineer

SoftwareMotion

01/2023 - Now

Remote, China

- Implemented 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%
- Developed a **PyQT** visualization tool for AEB and ACC systems, integrating BEV plots to drastically reduce debugging time. Processed MF4 and CAN signals (BLF, DBC) for enhanced vehicle issue diagnosis.
- Evaluated and integrated advanced path planning solutions, such as lattice-based and **Apollo's** EM planner. Also, developed and implemented obstacle avoidance algorithms with **DP** and **A*** techniques, validated through a custom Python-based simulator.

Machine Learning Engineer

Hara AI Company

10/2021 - 01/2023

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.
- Building a filter for detecting operator interruptions and poor voice quality using VAD algorithms.
- 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 reverberation) to pinpoint vulnerabilities.

Robotic Researcher

KN2C Robotic Lab

05/2015 - 09/2017

Tehran, Iran

- Enhanced robot performance in KN2C's SSL team by designing, soldering, and maintaining Xmega and ST processor boards for motor control and precise **PID** calibration.
- Enhanced ball detection accuracy by implementing a **Kalman Filter** with the Armadillo library in **C++**.

Embedded System Engineer

Raiwan

12/2017 - 06/2019

Tehran, Iran

Designed an *Inner Hospital Communication System*, incorporating STM32 and ESP32 board design and programming, and established communication using RS485 devices. Custom-machined the device frame with CNC to match project specifications.

Designer of a Trader Bot

QDM

04/2019 - 01/2020

Tehran, Iran

Developed a Metatrader trading bot using a technical strategy, enhanced by a **Deep Q Network** in **PyTorch**. Leveraged a socket connection for real-time data and analysis of historical data from 2007-2019 in Metatrader. Documented a version on this [Medium blog](#) and this [Github repo](#).

NOTABLE PROJECTS

- Implemented an image captioning application using **Resnet18** and **LSTM** models in **PyTorch**.
- Localized Anki robot in a **Gazebo** environment using **particle filter** and **EKF** algorithms.
- 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.

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

SKILLS

Programming C++ (Advanced), Python (Advanced), C (Advanced), Matlab (familiar)

Frameworks Pytorch (Advanced), Tensorflow (Advanced), Mlflow (Intermediate), Simulink (familiar), ROS (familiar)

Libraries Numpy, Pandas, Matplotlib, OpenCV

Hardware Keil, Stm32Cube, ARM, XMega, Arduino, Altium, Soldering

Misc Git, Linux, Docker, Software Testing, GTest

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