

# REZA KARBASI

## Robotic Engineer

@ [arzkarbasi@gmail.com](mailto:arzkarbasi@gmail.com) | [in LinkedIn](#) | [Reza Karbasi](#) | [Portfolio](#) | [Tehran, Iran](#)

### 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*

*Jan. 2023 - Present*

*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*

*Oct. 2021 - Jan. 2023 (15 months)*

*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*

*May 2015 - Sep. 2017 (28 months)*

*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 Software Engineer

*Raiwan*

*Dec. 2017 - Jun. 2019 (19 months)*

*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.

### NOTABLE PROJECTS

- 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](#).
- 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

---

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