Davoud Nikkhouy

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ABOUT ME

Robotics and Embedded Systems Engineer with a strong foundation in mechanical and aerospace engineering, transitioning into advanced embedded software, AI-driven control, and autonomous robotics. Over five years of experience in developing real-time systems (STM32, FreeRTOS), intelligent motion planning (ROS, Gazebo), and machine learning–based controllers for mobile and self-balancing robots. Experienced in combining theoretical research and practical implementation, from firmware architecture to reinforcement learning and predictive control.

WORK EXPERIENCE

Politecnico di milano – Milan, Italy

City: Milan | **Country:** Italy

research assistant

[1 May 2024 – Current]

- Developed deep-fuzzy reinforcement learning algorithms for mobile robot navigation in dynamic and uncertain environments using ROS2 and Gazebo.
- Designed predictive controllers for self-balancing two-wheeled robots using deep neural networks and simulation-driven optimization.
- Built and tested kino-dynamic simulation pipelines and model predictive controllers (MPC) for trajectory tracking and collision avoidance in real-time.

FanAvin Co. – Tehran, Iran

City: Tehran | **Country:** Iran

Mechatronics engineer

[1 Mar 2019 – 15 Dec 2023]

- Led development of embedded firmware for an STM32-based autopilot system with RTOS architecture and real-time task scheduling.
- Built a camera-guided mobile robot with autonomous navigation using image processing and sensor fusion.
- Developed a fuzzy-logic-based controller for a social robot interacting with dynamic moving targets.
- Engineered a high-speed autonomous watercraft with real-time obstacle avoidance algorithms.
- Designed and launched several electromechanical systems, including a 6-DOF robotic arm for 3D printing and a 3-axis hydraulic robot.
- Created a high-temperature smart oven (400°C) with custom embedded control.

EDUCATION AND TRAINING

Master of mechanical engineering

Iran University of Science and Technology [30 Sep 2017 – 30 Sep 2020]

City: Tehran | **Country:** Iran | **Website:** https://www.iust.ac.ir/en | **Field(s) of study:** mechanical engineering | **Final grade:** 15.5 / 20 | **Level in EQF:** EQF level 7 | **Thesis:** Path planning and control of a mobile social robot in an environment with moving obstacles to reach the mobile target using fuzzy control

Bachelor of Aerospace engineering

Sharif University of Technology [30 Sep 2010 – 30 Sep 2015]

City: Tehran | **Country:** Iran | **Website:** https://en.sharif.ir | **Level in EQF:** EQF level 6

SKILLS

Embedded Software Development

STM32 / ARM / ESP32 / Arduino / PLC / Keil

Real Time Operating Systems

ROS & ROS2 / RTOS / FreeRTOS / Nuttx / Embedded Linux / Gazebo (Robotics simulator)

Software Development and version control

C/C++ / Python / MATLAB / Git (Github / Gitlab) / CMake / Catkin

PUBLICATIONS

[2025]

Fuzzy Q-Learning with Fuzzified Bellman Equation for Unmanned Ground Vehicle Navigation

Authors: Davood Nikkhouy; Mohsen Jalaeian Farimani | **Journal Name**: 9th International Conference on Robotics and Automation Sciences (ICRAS 2025)

[2025]

Bi-Level Performance-Safety Consideration in Nonlinear Model Predictive Control

Authors: Davood Nikkhouy; Aliasghar Arab; Mohsen Jalaeian Farimani | **Journal Name**: Proceedings of Machine Learning Research (Preparation for submitting)

[2022]

Use of Artificial Intelligence to Identify Adhesive Joints Defects by Using Ultrasonic

Authors: Davoud Nikkhouy, Rastegarmoghaddam, M., rajabi, M | **Journal Name**: Amirkabir Journal of Mechanical Engineering | **Volume, Issue and Pages**: 54(2), pp. 377-390

[2021]

Path Design and Control of a Moving Social Robot in an Environment with Moving Obstacles to Reach a Moving Target through Fuzzy Control

Authors: Davood Nikkhouy; Moharam Habibnejad Korayem; Siavash Fathollahi Dehkordi | **Journal Name**: Amirkabir Journal of Mechanical Engineering | **Volume, Issue and Pages**: 53, 2, 2021, 993-1014

[2018]

Control a mobile robot in Social environments by considering humans as a moving obstacle

Authors: S. D. N. Tanha, S. F. Dehkordi and A. H. Korayem | **Journal Name**: 2018 6th RSI International Conference on Robotics and Mechatronics (IcRoM) | **Volume, Issue and Pages**: pp. 256-260

REFERENCES

[1 Apr 2024 – Current]

Professor Mohsen Jalaeian Farimani

PhD, Robotics and Control Engineering,

Assistant professor, Politecnico di Milano University,

mohsen.jalaeian@polimi.it

Link: https://www.deib.polimi.it/eng/people/details/2012404

[1 Oct 2008 – Current]

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