

Pourya Shahverdi

Last updated in March 2025

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Summary

Robotics Engineer with 8+ years of expertise in humanoid robotics, AI/ML, and embedded systems. Skilled in evaluating and deploying architectures, collaborating with stakeholders, and transforming complex requirements into reliable, innovative robotics solutions.

Education

Ph.D.	Electrical and Computer Engineering - Oakland University, Michigan, Ph.D. Candidate	2021 - 2025
M.Sc.	Mechatronics Engineering - University of Tehran (Thesis) Azad University of Qazvin	2013 - 2016
B.Sc.	Robotics Engineering - Hamedan University of Technology	2008 - 2013

Selected Coursework (all A or A-): Robotic Systems and Control, Advanced Robotic, Mobile Robot Navigation, Robot Sensors, Embedded Programming, Artificial Intelligence, Artificial Neural Networks, Advanced Autonomous Vehicle, Engineering Project Management

Work Experience and Accomplished Projects

Lead Researcher at IRL² and **Lab Instructor at the ECE Department** Oakland University, MI
- Led AI/ML Projects in Social Robots Learning Verbal and Nonverbal Behaviors at IRL²: 2021 - Present

- Developed an Imitation Learning Pipeline of Multimodal LSTM Networks to Learn Turn-Taking Behavior from Demonstration
- Developed a VR-Teleoperation System for the Pepper Robot's Navigation, SLAM, and Gesture Imitation
- Spearheaded Original Research and Developed Multiple ROS-Based Teleoperation Systems for Human User Studies [1], [2], [3]
- Co-supervised a Project on Manipulation Few-shot Learning from Human Demonstrations

- Developed a 3D object tracking system for autonomous vehicles that could simultaneously fuse data from the vehicle's LIDAR and radar sensors, merging measurements into single object tracks.

- Electromechanics System Design Lab Instructor at the ECE Department (Embedded Programming, Circuits, Sensors, and Actuators)

FIRA **Education Department Manager** Tehran
- Designed Syllabus, Educational Platforms, Content, and Competitions in Collaboration with FIRA-International 2018 - 2020

Research Assistant at Taarlab **Human-Robot Interactoin Laboratory** Tehran
- Developed Whole-Body Imitation of Human Motion by a NAO Humanoid Robot 2012 - 2017

- Presented a Geometric Inverse Kinematics Solver Specific to the Humanoid Imitation
- Presented a Solution to Detect the Balance Support Polygon and Robot's Support Leg From the Kinematics Data
- Dynamically Modeled the Robot's Whole Body as a 1-DoF and 2-DoF Inverted Pendulum
- Designed and Deployed a PID Controller to Maintain the Robot's Balance while Imitating the Human Whole Body Movements

- Designed and Integrated an Embedded Board to Torque-Control the Robot's AC-Servos using MODBUS Protocol through a GUI

- Developed an Embedded Board and Deployed an ML model to Classify Beam Widths Based on Ironworkers' Walking Patterns

Part-Time Research Intern At MRL-HSL , Qazvin
- Developed a Navigation System for the Humanoid Soccer Player Robot to Detect the Opponent's Gate by Fusing the IMU and Camera Data and Resolved the Robot's Friendly Kicks 2013 - 2015

- Contributed to the Design, Kinematics and Dynamic Modeling, and Motion Planning of a Humanoid Robot Designed by MRL-HSL

- Tuned the Walking Gate of the Robot to Maintain its Balance while Walking on the Carpet and Artificial Grass

Skill Set

Robotics and Mechatronics Tools and Techniques ROS/ROS2, Gazebo, NVIDIA Isaac Sim, CoppeliaSim, Controller Design for Real-World, Hardware-in-the-Loop (HIL), Embedded System Design (ARM, AVR), Real-Time Operating System (RTOS), Single Board Programming, PLC SIMATIC Step 7, PCB Design (Altium Designer), CAD (Solidworks)

Programming Proficient with C++, Python, Matlab; Widely used Simulink, Mathematica, R; Familiar with Kotlin

AI Tools Widely used OpenCV, PyTorch, scikit-learn; Familiar with TensorFlow, Keras, JAX, Hugging Face

AI Techniques Accomplished Robot Manipulation, Imitation, and Navigation Projects with Reinforcement Learning (DQN, PPO), Computer Vision (CNNs, YOLO), Time-Series ML (LSTM), Multimodal Learning (Vision-Radar-LiDAR Fusion), and Bayesian AI (Kalman & Particle Filters, uncertainty modeling); Familiarity with Generative AI (VAEs, ViTs) and Learning about Diffusion Models

Miscellaneous Agile Scrum Master, Linux, Git, Docker, QT Creator (PyQt and C++), SPSS, LaTeX, Network

More at pourya-shahverdi.github.io

I don't need visa sponsorship