

Farzad Ahmadinejad

Senior Robotics Software Engineer

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Robotics engineer with 14 years of experience building autonomous ground, aerial, and marine systems end to end, from PCB and firmware through perception, control, and full ROS 2 navigation stacks. Currently tech lead of a six-engineer team at Lomby, where the delivery robot fleet is in daily service and scaling into production. Previously designed omnidirectional USVs for bridge inspection that have been in continuous field use for over five years. Experienced in taking research prototypes through to shipping products, with results including a 62% sensor cost reduction, 30% faster deliveries, and centimetre-level tracking accuracy.

CORE SKILLS

Perception & SLAM 3D and 2D LiDAR, cameras, IMU, GNSS/RTK; LiDAR-Inertial Odometry (LIO), Visual-Inertial Odometry (VIO), scan-to-map localization; multi-sensor fusion (EKF/UKF); DNN training and fine-tuning for detection

Control Theory PID, LQR, MPC, MRAC, fuzzy logic, ADRC; inverse kinematics; state estimation; system identification and tuning

Planning & Navigation global and local path planning (A*, JPS), 3D planning on Octree/OctoMap representations, trajectory generation and tracking, costmap and behaviour design, custom ROS 2 navigation stacks

Software C, C++, Python, JavaScript, MATLAB; ROS 2 and ROS 1; Linux, Git, Docker, OpenCV, PCL

Electronics & Embedded MCUs, PCB design (Altium, KiCad), RTOS, digital filters, sensor and motor interfaces

Systems & Tooling MQTT, ZMQ, REST, RTSP; Gazebo, Fusion 360; telemetry and fleet-monitoring pipelines

EXPERIENCE

Lomby | Tokyo, Japan

Aug 2024 – Present

Tech Lead, Robotics Software (last-mile autonomous delivery robots)

- **Team leadership:** lead a team of 6 robotics engineers across navigation, perception, and controls, and own the software architecture and technical direction of the delivery robot platform.
- **Custom ROS 2 navigation stack:** developed an in-house point cloud processing, localization, path planning, and control pipeline, purpose-built for constrained sidewalk and pedestrian environments.
- **62% sensor cost reduction:** redesigned the sensor configuration and software architecture, cutting per-robot sensor cost by 62% while increasing sensor coverage.
- **20% lower ECU power draw:** restructured the software architecture to reduce CPU and GPU load, lowering ECU power consumption by 20%.
- **30% faster deliveries:** shipped navigation features that cut average delivery time by 30% and halved the rate of manual operator intervention.
- **On-robot telemetry and data collection:** designed and built a delivery metrics and monitoring module that records key data for every delivery and uploads it automatically to the server, used for operational reporting and performance analysis.
- **System-level debugging:** resolved odometry drift, inter-sensor time synchronization, motor command and feedback latency, and LiDAR reflection artifacts, and tuned controllers and navigation parameters.
- **Deployment:** robots in daily operational service today, with the fleet scaling into production.

Japan Infra Waymark (NTT West subsidiary) | Tokyo, Japan

Aug 2020 – Aug 2024

Senior Robotics Specialist (drone and USV systems for infrastructure inspection)

- **Omnidirectional USVs for bridge inspection:** led development across 4 hardware generations, covering electronics subsystem design, controller firmware, and an autonomous navigation system fusing a VIO camera, 3D LiDAR, and GNSS. 8 units deployed and in continuous field use for over 5 years.
- **Close-proximity power line tracking (10 cm):** developed PCL-based target detection, SLAM, and autonomous flight control that tracks overhead cables to within 10 cm using RTK GPS and 3D LiDAR on ROS 2, on 4 custom-built inspection drones.
- **Multi-drone ground station:** built operator-facing ground station software (JavaScript and Python) with formation control for coordinated flight of multiple drones.
- **Recognition:** received NTT West Impactful Project Awards in 2022 and 2023 for field-deployed inspection systems.

Blue Innovation | Tokyo, Japan

Jun 2019 – Aug 2020

Robotics Engineer

- **GPS-denied 3D drone navigation:** built 3D mapping, path planning, and navigation using VIO and 2D LiDAR with Octree, JPS, and MPC. Demonstrated at CES 2020.
- **Mecanum-wheeled AGV autonomy:** developed low-level firmware, ROS controller, 2D LiDAR SLAM, and navigation for an AGV operating in coordination with a drone.

- **Hardware design:** PCB design for custom sensor and peripheral interfaces to NVIDIA Jetson TX2.

MehrTronix Ltd. | Iran

Nov 2016 – Mar 2019

Co-founder and Robotics Engineer (robotics startup, team of 7)

- **Restaurant service robot (Hooshyar-bot):** owned system architecture, electronics design, and navigation software for a custom waiter robot.
- **Parcel sorter and profiler:** trained a DNN by transfer learning for parcel label recognition and designed the computer vision pipeline for a custom high-speed sorter deployed at Digikala. Published at ICSPIS 2018.
- **Human-following AGV:** team lead for transfer-learned human detection (MobileNet-SSD and OpenVINO), SLAM, custom path planning, and navigation software, in collaboration with Kyutech University.
- **Pepper (SoftBank Robotics):** developed custom robot behaviours using the Pepper SDK.

ARC Robotics Lab, Amirkabir University of Technology | Iran

Aug 2014 – Nov 2016

Mobile Robots Researcher and Team Leader (team of 5)

- **RoboCup@Work mobile manipulator:** team lead; developed the inverse-kinematics controller for a 5-DoF arm, CNN-based 3D object detection, pose estimation, and grasping. Competition finalist.
- **Autonomous aerial parcel delivery:** team lead; developed computer vision for obstacle avoidance and precision landing using stereo vision and fiducial markers.

AUTMan Humanoid Team, Amirkabir University of Technology | Iran

2011 – 2014

Humanoid Robotics Team Member (RoboCup kid-size league, alongside M.Sc. studies)

- **Kid-size humanoid soccer robots:** custom-built humanoid platforms and NAO, including evolutionary optimisation of an offline walk engine (published). 1st place, RoboCup IranOpen Humanoid League.

Emen Ertebat Pouya Ltd. | Iran

Aug 2009 – Jul 2011

Embedded Systems Engineer

- Designed PCBs and firmware for a mass-produced industrial boiler-room temperature control and monitoring system, and for a mass-produced portable water dispenser with a graphical user interface.

EDUCATION

M.Sc., Electrical Engineering (Mechatronics) | Amirkabir University of Technology

2011 – 2014

Thesis: Design and control of a low-altitude terrain-following quadcopter

B.Sc., Electrical Engineering (Control Systems) | Iran University of Science and Technology

2006 – 2011

Thesis: Design and real-time control of a vision-based ball-and-plate system

PUBLICATIONS

F. Ahmadinejad, J. Bahrami, M. B. Menhaj, S. Shiry Ghidary. "Autonomous Flight of Quadcopters in the Presence of Ground Effect." 4th Iranian Conf. on Signal Processing and Intelligent Systems (ICSPIS), IEEE, Tehran, 2018, pp. 217–223.

M. A. Athari, F. Ahmadinejad, M. Ahmadi. "Design and Implementation of a Parcel Sorter Using Deep Learning." 4th Iranian Conf. on Signal Processing and Intelligent Systems (ICSPIS), IEEE, Tehran, 2018, pp. 167–171.

F. Ahmadinejad, H. Farazi, S. Shiry Ghidary. "A Low-Cost Vision-Based Tracking System for Position Control of Quadrotor Robots." 1st RSI/ISM Int. Conf. on Robotics and Mechatronics (ICRoM), IEEE, Tehran, 2013.

H. Farazi, F. Ahmadinejad, F. Maleki, M. E. Shiri. "Evolutionary Approach for Developing Fast and Stable Offline Humanoid Walk." 3rd Joint Conf. of AI & Robotics / 5th RoboCup Iran Open Int. Symposium (RIOS), Tehran, 2013.

AWARDS

- **Impactful Project Award** · NTT West, Japan 2022, 2023
- **Finalist, RoboCup@Work Industrial Robots Competition** · RoboCup, Japan 2017
- **Best System Design Award, Delivery Drone Competition** · Digikala, Iran 2016
- **1st place, International Aerial Robotics Competition** · AUTCup, Iran 2015
- **2nd place, International Micro Air Vehicle Competition** · IMAV, Germany 2015
- **1st place, International MAV Competition** · RoboCup IranOpen, Iran 2014
- **1st place, International Humanoid Robots Competition** · RoboCup IranOpen, Iran 2012

LANGUAGES & STATUS

Persian (native) · English (professional working proficiency) · Japanese (conversational, JLPT N4) · Permanent Resident of Japan