

Mehdi Mehdikhani

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Professional Summary

Experienced Software Engineer specializing in robotics and industrial automation systems with 7+ years of experience designing scalable and reliable solutions. Proven expertise in architecting modular and resilient software, implementing safety-critical systems, and leading digital transformation initiatives. Currently developing enterprise-grade microservices communication libraries to enable company-wide transition from monolithic to distributed architectures. Strong background in distributed systems, message-oriented middleware, localization algorithms, and DevOps practices for industrial-grade applications.

Core Competencies

- **Software Architecture:** Distributed Systems Design, Microservices Architecture, Message-Oriented Middleware, Publisher-Subscriber Patterns, Design Patterns (SOLID), Legacy System Modernization, Large-Scale Refactoring, System Integration, API Design, Event-Driven Architecture, Real-Time Systems, Cross-Platform Development
- **Robotics & Automation:** SLAM Algorithms, Motion Planning, Sensor Fusion, Localization Systems, Safety-Critical Systems, Industrial Protocols (EtherCAT, Modbus)
- **Programming & Frameworks:** C++17/20, Modern C++ Concurrency, Python, Qt, Boost, STL, Zenoh, OpenCV, Eigen, CMake, VCPKG, Thread Management, Multithreading
- **DevOps & Infrastructure:** Docker, Jenkins, GitHub Actions, Testing Pipeline Implementation, Automated Testing Frameworks, AWS, Infrastructure as Code, Monitoring (Prometheus, Grafana), Linux System Administration
- **Development Practices:** Agile/Scrum, TDD, Code Reviews, Technical Documentation, System Design, Performance Optimization, Security & Encryption, Library Development, Observability, Monitoring & Metrics

Professional Experience

Product Engineer

Lonate Pozzolo, Italy

○ *Fives Intralogistics Spa, Full-time, Hybrid*

Jun 2021 – Present

- **Enterprise Microservices Library Development:** Architected and developed enterprise-grade distributed systems communication library enabling seamless transition from monolithic to microservice architectures company-wide. Features include publisher-subscriber messaging patterns, secure encrypted communication, cross-platform compatibility (Windows/Linux), advanced thread management, comprehensive system monitoring, and observability tools. Built with modern C++17/20, Zenoh middleware, Protobuf, and contemporary concurrency patterns.
- **Large-Scale Refactoring:** Led strategic refactoring of 500K+ line monolithic codebase toward microservice architecture, implementing SOLID design principles and improving code maintainability and scalability across multiple product lines.
- **System Architecture:** Designed and architected next-generation collaborative robotics platform, establishing software design patterns and architectural standards.
- **DevOps Leadership:** Led digital transformation by implementing enterprise-grade CI/CD pipelines, reducing deployment time and establishing automated testing frameworks. Implemented comprehensive testing pipelines across existing product portfolio, improving code quality and release reliability.
- **Real-Time Systems:** Architected safety-critical real-time subsystems for autonomous mobile robots, ensuring compliance with industrial safety standards.
- **Algorithm Development:** Led development of proprietary SLAM and localization algorithms achieving sub-centimeter precision at high-speed operations, resulting in significant productivity improvement.
- **Cost Optimization:** Identified and executed cost reduction strategies through architectural improvements, achieving significant reduction in hardware costs while maintaining performance standards.
- **Technical Leadership:** Mentored cross-functional teams on software architecture best practices and established coding standards across the R&D department.

Robotics Software Engineer

Isfahan, Iran

○ *Isfahan University of Technology (ARMLab), On-site*

Sep 2016 – Aug 2018

- **Robotic Systems Design:** Architected and implemented complete software stack for autonomous mobile robots including SLAM, path planning, and navigation systems.
- **Embedded Systems:** Designed and developed real-time control systems for precision machining applications, implementing force feedback control achieving sub-millimeter accuracy.
- **Hardware Integration:** Developed custom motor control boards and sensor interfaces for haptic feedback systems, bridging hardware-software integration challenges.
- **Industrial Automation:** Designed HMI systems and programmed PLC controllers for industrial automation applications, focusing on reliability and user experience.
- **Mechatronics:** Implemented control algorithms for multi-axis industrial gimbal systems, demonstrating expertise in mechatronics system integration.

Key Achievements

- **System Performance:** Achieved sub-centimeter localization precision for high-speed mobile robots in industrial environments
- **Process Improvement:** Reduced deployment cycles from weeks to hours through comprehensive CI/CD pipeline implementation
- **Safety Compliance:** Successfully architected safety-critical systems meeting industrial safety standards
- **Team Impact:** Led cross-functional teams in adopting modern software architecture practices across R&D department

Education

- **Politecnico di Milano** **Milan, Italy**
MSc - Computer Science and Engineering, Robotics Track *Sep 2018 – Apr 2021*
Thesis: Integration of low-cost gyro in industrial robot localization
- **Isfahan University of Technology** **Isfahan, Iran**
BSc - Computer Software Engineering *Sep 2012 – Sep 2017*
Specialized in Embedded Systems and Real-Time Computing

Intellectual Property

- **Modular Data Acquisition and Motor Control Board** **Patent #92172**
Iranian Patent Office *Apr 2017*
Designed and patented a modular interface system for industrial automation, enabling scalable connectivity between controllers and various sensors/actuators. The device features expandable architecture supporting multiple peripheral connections through extension boards, facilitating complex robotic and automation applications.

Publications & Research

- **Integration of a low-cost gyro in the localization of an industrial robot**
Politecnico Di Milano, Master Thesis *Apr 2021*
Advanced sensor fusion research improving robot localization accuracy through MEMS gyroscope integration and enhanced odometry estimation
- **A Model-Free Approach to General Video Game Playing**
IEEE KBEI Conference, Conference Paper *Dec 2017*
Applied machine learning techniques to autonomous decision-making systems

Selected Technical Projects

- **M2M Vehicle Tracking System:** Designed and developed comprehensive vehicle telematics platform for data acquisition, analysis, and visualization of 500+ vehicle signals. Created scalable architecture supporting both OEM integration and end-user applications with real-time monitoring capabilities
- **Autonomous Navigation System:** Developed comprehensive SLAM and navigation solution for indoor mobile robots, implementing theoretical foundations of simultaneous localization and mapping with practical real-time performance optimization
- **Precision Machining Control System:** Architected embedded control system for high-precision polishing applications, featuring innovative force feedback mechanisms and real-time force measurement capabilities achieving sub-millimeter accuracy
- **Motor Control Interface Board:** Designed comprehensive motor control solution with integrated torque and speed control, position feedback systems, and encoder-based precision positioning for haptic and robotics applications
- **Thermal Imaging System:** Developed complete thermal camera system using thermopile sensor arrays with servo-based scanning mechanism, demonstrating embedded system integration and sensor fusion capabilities

Professional Recognition & Awards

- **ROSCon Full Scholarship Recipient (2017):** Selected by the Open Source Robotics Foundation for full sponsorship to attend ROSCon conference in Vancouver, Canada, recognizing contributions to robotics software development
- **Academic Excellence Award:** Ranked 3rd in Computer Engineering class (top 1%) at Isfahan University of Technology (2012-2017)
- **National Robotics Competition Winner:** First place in Kharazmi Young Scientists Competition, Iran's premier scientific competition sponsored by multiple government ministries and research organizations (2011)
- **Merit-Based Graduate Admission:** Direct admission offers to M.Sc. programs at Isfahan University of Technology and Amirkabir University of Technology without national entrance examination (2017)

Language Skills

- **English:** Full professional proficiency
- **Italian:** Full professional proficiency
- **Persian:** Native or bilingual proficiency

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