Amin Najafqolian

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Education

2020-2023 **University of Tehran (UT)**, Tehran, Iran.
M.Sc. in Mechatronics Engineering
- **Thesis**: Formation Control of Multi Robot Systems Based on Learning Model Predictive Control
- Cumulative GPA: 18.50/20 via 29 credits

2015-2020 **Amirkabir University of Technology (Tehran Polytechnic)**, Tehran, Iran.
B.Sc. in Mechanical Engineering
- **Thesis**: Design and manufacture of a portable vibration simulator

2011-2015 **National Organization for Development of Exceptional Talents (NODET)**, Allameh Helli.
High School Diploma in Mathematics and Physics

Research Interest

- Advanced Control Systems
- Machine Learning in Robotics
- Uncertainty-Aware Decision Making
- Resilient Autonomy in Robotics
- Hybrid Data-Model Frameworks
- Vision-Based Defect Detection

Publications ⓘ

2024 "Control of Robots Using Convex QP LMPC and Learning-Based Explicit-MPC", in **IEEE Transactions on Industrial Informatics**.

2024 "Robot Trajectory Tracking using Combined Stochastic Model-Free Position and DDPG-based Attitude Control", in **ISA Transactions**.

2024 "Dynamic Model-Free Reinforcement Learning Strategies for Achieving Nash Equilibrium in Graphical Games with Communication Challenges", in 12th RSI International Conference on Robotics and Mechatronics (ICRoM).

2022 "Formation Control of Multiple Robots Using LSTM-based Model Predictive Control", in 10th RSI International Conference on Robotics and Mechatronics (ICRoM).

2022 "Formation Control of Multi-Robots Based on Deep Q-learning", in 10th RSI International Conference on Robotics and Mechatronics (ICRoM).

Notable Honors, Awards and Licenses ⓘ (Please refer to my LinkedIn for more details)

2024 **Professional Engineer License (Design and Supervision)**, Iran Construction Engineering Organization.
- *Achieved 1st place in the design exam among 25,000 educated high-level engineers.*

2023 **Ranked 1st** among Master of Mechatronics Engineering students at University of Tehran

2018 **Technology Designer and Presenter** at Mobilistic'18
- *Presented innovative technology alongside industry leaders such as Tesla, BMW and Porsche, showcasing cutting-edge solutions in a competitive environment.*

2017 **4th Place** in RoboCup
- *Small Size League at RoboCup 2017, Nagoya, Japan.*

2017 **3rd Place** in IranOpen
- *Small Size League at IranOpen 2017*

2017 **1st Place** in FiraCup
- *Inventory Management at FiraCup 2017*

2016 **FiraCup Technical Committee**

2015 **Ranked 360th** among more than 250,000 participants in the Nation-Wide University Entrance Exam

Teaching and Laboratory Experience ⓘ (Please refer to my LinkedIn for more details and experiences)

Fall 2022 – Present	**Research Assistant** at Advanced Service Robots Laboratory, Field of Expertise: Mechatronics, Robotics, Control. Supervisor: Prof. Khalil Alipour, University of Tehran.
Spring 2022 – Fall 2022	**Teaching Assistant**, Advanced Automatic Control (Graduate Course), Prof. Khalil Alipour, University of Tehran.
Fall 2019 – Spring 2023	**Head of Laboratory** , Mechatronics and Automation. Amirkabir University of Technology.
Fall 2020 – Spring 2022	**Teaching Assistant**, Mechatronics (Graduate and Undergraduate Course), Amirkabir University of Technology.
Winter 2020 – Spring 2020	**Instructor** of Advanced Mechatronics at Academic Center for Education, Culture, and Research.
Fall 2018 –Spring 2019	**Teacher of Robotics** at Salam high school.
Fall 2017 –Summer 2018	**Leader** of Parsian Robotics Center, Amirkabir University of Technology.
Fall 2015 –Fall 2017	**Hardware Manager** of Parsian Robotics Center, Amirkabir University of Technology.
Spring 2013	**Teacher** of Hardware design at Iran Technical & Vocational Training

Notable Industrial Experience ⓘ (Please refer to my LinkedIn for more details and experiences)

2022 – Present **Elcarad Industry**
- Led the development of innovative solutions across various sectors, including: Predictive maintenance systems, Fleet management, Industrial automation, Digital twin and Industry 4.0
- Drove operational efficiency and enhanced safety standards.
- Collaborated with industry leaders to implement advanced technologies tailored to meet specific operational challenges.

2019 – 2022 **Future Green Systems (FGS)**

- Designed a Smart Thin Card for multi-purpose monitoring, enhancing operational capabilities in industries such as healthcare.
- Developed an Accelerometer Testing and Calibration System featuring a high-speed agile spinner and precision vibration table, improving testing accuracy and efficiency.
- Engineered a skid conveyor system for the largest car manufacturer, automating grip adjustments and integrating RFID for enhanced production efficiency.

2015 – 2020 **IKAP Robotics and Reuleo**

- Led the design and development of innovative robotics projects, including the Reuleo and Olive Smart Suitcase and Smart Inspection System.
- Leveraged advanced technologies such as machine vision and AI to enhance user experience and quality control in manufacturing.

Notable Projects ⓘ (Please refer to my LinkedIn for more details and projects)

Predictive Maintenance System (Elcarad Industry)

- Hardware and software integration
- Rotor vibration monitoring
- Malfunction diagnosis
- Failure prediction
- Repair agenda provision
- Digital twin solution

Smart Suitcase (Reuleo)

- Intelligent robotics integration
- Motorized Omni wheels (Reuleo)
- Two-wheel design (Olive)
- Smartphone connectivity and control
- Advanced navigation systems
- Enhanced mobility and convenience

Smart Inspection System (IKAP Robotics)

- Advanced machine vision technology
- User-friendly web application
- High precision in quality control
- Detects defects (0.01 mm accuracy)
- Deployed across production lines
- Streamlined inspection processes

Some Related Skills ⓘ (Please refer to my LinkedIn for more details and skills)

- **Programming Proficiency**: C ++, Python, MATLAB, ROS, JS, Node.js, PyTorch, VB, Android Studio
- **Hardware Proficiency**: PLC, Arduino, AVR, ESP32, ARM, PIC, Altium Designer, SOLIDWORKS

Language Proficiency

- English: IELTS Overall 7.5/9
- Deutch (A2)