

# Mohamad Amin Najafqolian

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## Education

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- 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 (Thesis included)
- 2015-2020     **Amirkabir University of Technology (Tehran Polytechnic)**, Tehran, Iran.  
*B.Sc. in Mechanical Engineering*
- **Thesis:** Design and manufacture of a portable vibration simulator
  - Cumulative GPA: 17.31/20 via 140 credits (last two years)
- 2011-2015     **National Organization for Development of Exceptional Talents (NODET)**, Allameh Helli.  
*High School Diploma in Mathematics and Physics*
- High School Diploma GPA: 19.52/20





## Research Interest

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- Advanced Control Systems
- Machine Learning in Robotics
- Predictive Maintenance Algorithms Development
- Smart Robotics for User Interaction
- Industry 4.0 Automation Innovations
- Advanced Vibration Analysis Techniques

## Publications <sup>①</sup>

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- 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", accepted at 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 <sup>①</sup> (Please refer to my LinkedIn for more details)

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- 2024     **Professional Engineer License (Design and Supervision)**, Iran Construction Engineering Organization.
- Achieved 1<sup>st</sup> 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      **4<sup>th</sup> Place** in RoboCup
- *Small Size League at RoboCup 2017, Nagoya, Japan.*
- 2017      **3<sup>rd</sup> Place** in IranOpen
- *Small Size League at IranOpen 2017*
- 2017      **1<sup>st</sup> 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 ⓘ [\(Please refer to my LinkedIn for more details and experiences\)](#)

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Fall 2022 – Present	<b>Research Assistant</b> at Advanced Service Robots Laboratory, Field of Expertise: Mechatronics, Robotics, Control. Supervisor: Prof. Khalil Alipour, University of Tehran.
Spring 2022 – Fall 2022	<b>Teaching Assistant</b> , Advanced Automatic Control (Graduate Course), Prof. Khalil Alipour, University of Tehran.
Fall 2019 – Spring 2023	<b>Head of Laboratory</b> , Mechatronics and Automation. Amirkabir University of Technology.
Fall 2020 – Spring 2022	<b>Teaching Assistant</b> , Mechatronics (Graduate and Undergraduate Course), Amirkabir University of Technology.
Winter 2020 – Spring 2020	<b>Instructor</b> of Advanced Mechatronics at Academic Center for Education, Culture, and Research.
Fall 2018 –Spring 2019	<b>Teacher of Robotics</b> at Salam high school.
Fall 2016 –Summer 2018	<b>Leader</b> of Parsian Robotics Center, Amirkabir University of Technology.
Fall 2015 –Fall 2016	<b>Hardware Manager</b> of Parsian Robotics Center, Amirkabir University of Technology.
Spring 2013	<b>Teacher</b> of Hardware design at Iran Technical & Vocational Training

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

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2022 – Present	<b>Elcarad Industry (CTO)</b> <ul style="list-style-type: none"> <li>• Led the development of innovative solutions across various sectors, including: <u>Predictive maintenance systems</u>, <u>Fleet management</u>, <u>Industrial automation</u>, <u>Digital twin</u> and <u>Industry 4.0</u></li> <li>• Drove operational <u>efficiency</u> and <u>enhanced safety</u> standards.</li> <li>• Collaborated with <u>industry leaders</u> to implement advanced technologies tailored to meet specific operational challenges.</li> </ul>
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- 2019 – 2022

**Future Green Micro Systems (RASA) (CTO)**
  - Designed a Smart Thin Card for multi-purpose monitoring, enhancing operational capabilities in industries such as mining and 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 (CTO)**
  - 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** ⓘ [\(Please refer to my LinkedIn for more details and projects\)](#)

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**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** ⓘ [\(Please refer to my LinkedIn for more details and skills\)](#)

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

**Language Proficiency**

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- English: IELTS Overall 7.5/9 (Speaking: 6, Writing: 7, Reading: 7.5, Listening: 8.5)
- Deutch (A2)