

AIDIN LATIFI

Mechanical Engineer | Mechatronics & Robotics

Torino, Piemonte, Italy (Open to relocate)

aidin.latifi@mail.polimi.it | +39 3444780565

LinkedIn: [linkedin.com/in/aidin-latifi](https://www.linkedin.com/in/aidin-latifi) | Portfolio: [AydinLT00.github.io](https://github.com/AydinLT00)

Permesso di Soggiorno (Attesa Occupazione) | Full-time employment eligible



PROFESSIONAL SUMMARY

Recent Politecnico di Milano Master's graduate in Mechanical Engineering (Mechatronics & Robotics) with hands-on experience in end-to-end mechatronic system development, from 3D mechanical design (SolidWorks) and simulation (MATLAB/Simulink/Simscape) to physical hardware integration, Model-in-the-Loop (MIL) testing, and Rapid Control Prototyping (RCP). Experience in applying machine learning (Deep Learning, RL, Seq2Seq Transformers) for robotic perception and automation, with a proven ability to implement algorithms from Bayesian optimization to reinforcement learning to achieve high-accuracy results. Currently based in Italy with a valid work-authorization permit (attesa occupazione), eligible for immediate hiring.

EDUCATION

M.Sc. Mechanical Engineering | Mechatronics & Robotics

Politecnico di Milano

September 2023 – March 2026

Italy, Milan

- Grade: 107/110

B.Sc. Mechanical Engineering

AmirKabir University of Technology (Tehran Polytechnic)

January 2018 – February 2023

Iran, Tehran

Thesis: Vibration Analysis of Rotating Rotor with Flexible Base

- Developed robust rotor dynamics models in MATLAB/ANSYS using Timoshenko beam theory
- Implemented advanced methods like Dynamic Compliance Matrix and Impedance Coupling, achieving over 95% correlation between simulation and theoretical results

MASTER'S THESIS

Deep Learning for Automated CAM in Robotic Manufacturing

In partnership with a leading machine tool manufacturer (under NDA)

September 2025 – March 2026

- Engineered a deep learning CAM pipeline to directly translate 3D B-rep CAD models into machine-executable robot code, eliminating manual programming for laser-cutting operations.
- Adapted a Graph Neural Network for topological feature recognition (achieving 100% test accuracy) and built a Seq2Seq Transformer to convert geometric primitives into robot trajectories.
- Developed a deterministic post-processing step to align continuous neural network outputs with exact source CAD geometries, reducing coordinate deviations by >70% to guarantee sub-millimeter manufacturing precision.

TECHNICAL SKILLS

- **Software & Programming:** Python, MATLAB/Simulink, C/C++, ROS2 (Jazzy), Git, PyTorch, Scikit-learn
- **CAD & 3D Modeling:** SolidWorks, ANSYS, Blender, 3D Printing (PrusaSlicer)
- **Hardware & Platforms:** Arduino, Raspberry Pi, Linux (Ubuntu, Debian), NVIDIA IsaacSim, Docker
- **Control Systems:** PID, Pole Placement, LQR, Optimal Control, Kalman Filter/State estimation
- **Other:** Microsoft Office Suite (Word, Excel, Powerpoint)

TECHNICAL PROJECTS

Real-Time Control of an Inverted Pendulum | *Project Lead* | *GitHub Demo*

- Led a team of 4 to deploy a real-time control system for a physical inverted pendulum, interfacing a TI LaunchPad, DC motor, and encoders with MATLAB/Simulink.
- Conducted experimental system identification (FFT, step-responses) to extract friction and motor parameters, building a Simscape "digital twin" validated against physical behaviour.
- Implemented discrete-time PID, LQR and Sliding Mode controllers alongside a bang-bang swing-up algorithm and Stateflow hardware safety logic.
- Designed Kalman and Luenberger state observers to estimate velocities, actively mitigating real-world sensor

noise, actuator deadzones, and stiction.

LLM-Powered Vision-Guided Robotic Chess Player | *GitHub Demo*

- Built a Python system enabling a robot arm to plan and execute pick-and-place chess moves from raw camera input and natural-language instructions in simulation using PyBullet.
- Integrated a CLIPort-style vision architecture with SayCan affordance grounding for reliable manipulation complying with Chess Rules.

3D-Printed Tendon-Driven Soft Robotic Gripper | *GitHub Demo*

- Designed and prototyped a compliant tendon-driven gripper entirely in SolidWorks, exported to PrusaSlicer, and 3D-printed.
- Programmed Arduino-based servo control logic for tendon tension, achieving reliable grasping of fragile and irregularly shaped objects.

Reinforcement Learning for Vision-Based Object Sorting | *GitHub Demo*

- Engineered a MATLAB-based PPO solution combining reinforcement learning with computer vision for industrial object sorting simulation, achieving over 95% accuracy.

Bayesian Optimization for Robot Parameter Tuning

- Auto-tuned link masses and PID gains of a 7DOF Panda robot in MATLAB, achieving trajectory planning accuracy with under 1° joint position error.

Deep Learning for Damage Propagation Prediction in U-Bolts | *GitHub Demo*

- Implemented deep learning (POD-DFNN, Autoencoder) models in Python to predict damage propagation from high-fidelity simulation data with less than 6% error.

EXPERIENCE

Mechanical Engineering Intern | Curricular

Mehrza Consulting

November 2022 - January 2023

Iran, Tehran

- Applied engineering principles to analyze and design mechanical systems (fluid distribution, safety protocols), ensuring compliance with industry standards
- Conducted system-level analysis and modeled layouts to meet stringent regulatory requirements

Production Engineering Intern | Curricular

Mapna Locomotive

August 2021 - September 2021

Iran, Alborz

- Assisted in streamlining daily operations, enhancing team productivity and workflow adherence
- Strengthened organizational and soft skills through multitasking and deadline management

OTHER PROJECTS

- Integrated AgileX Limo in Isaac Sim using Action Graphs to bridge ROS2 Jazzy SLAM and Navigation2 stacks.
- 4DOF SCARA Robot Design & Simulation (SolidWorks, MATLAB/Simulink/Simscape)
- Signal Processing and Modal Analysis of a Tie-Rod under corrosion (MATLAB)
- Mitsubishi RV-13FL Manipulator Robot Full Analysis and Simulation (MATLAB)
- PLC Ladder Programming for in-lab Production Line Automation (Kinco Builder)
- Ball and Beam Control System Design (MATLAB)
- 3D Design and Simulation of Gearbox Shafts and Gears (SolidWorks)

CERTIFICATIONS

- **Data Analysis with Python** – IBM (Coursera)
- **Machine Learning** – Stanford University (Coursera)
- **Foundations of Data Science (K-Means Clustering in Python)** – University of London (Coursera)

LANGUAGES

English: C1 (IELTS: 7.5) | **Persian:** Native | **Italian:** A2/B1 (Actively improving)