Amin Mirfakhar

Automation Engineer & CS Ph.D. Student

Education

Tulane University — New Orleans, USA
Ph.D. in Computer Science — 2025 - Present
- Advisor: Prof. Ramgopal Mettu
- Research Focus: Algorithms for Single and Multi-Agent 3D Printers

Sharif University of Technology (SUT) — Tehran, Iran
MS.C. in Mechanical Engineering (Mechatronics), GPA: 3.82/4.0 — 2020 - 2023
- Advisor: Prof. Aria Alasty
- Thesis: Path Planning and Control of Aerial-Terrestrial Swarm Robots Using Image Processing and Artificial Intelligence

Iran University of Science and Technology (IUST) — Tehran, Iran
BS.C. in Mechanical Engineering, GPA: 3.86/4.0 — 2016 - 2020
- Advisor: Prof. Moharam Habibnejad Korayem
- Thesis: Dynamic Simulation of a Cable-Driven Rehabilitation Robot and Controller Design

Professional Exprience

Durali System Design and Automation (DSDA) — Tehran, Iran
Automation Engineer — April 2022 - Dec 2024
- Description: Contributed to multiple R&D and production projects in automation, image processing, robotics, and dynamic system modeling.

Automation Intern — Jan 2022 - April 2022
- Description: Gained hands-on experience with PLCs, transmitters, and actuators. Responsible for customer consultations, electrical circuit diagrams (EPLAN), CAD design of terminal boxes, IO list extraction, and PLC programming.

Human and Robot Interaction Laboratory (Taarlab) — Tehran, Iran
Research Assistant — July 2018 - Jan 2020
- Description: Worked on simulation and control of robotics systems, including a 2-DOF parallel robot and a multi-rotor drone.

Awards

- **Best International Invention Award**, ISIF'24 (Istanbul International Inventions Fair), Turkey, 2024
- **Direct Admission Offer** to M.Sc. Programs in Mechatronics, SUT and Amir Kabir University, based on GPA, 2020
- **Ranked 3rd** among 121 B.Sc. mechanical engineering, IUST, 2020
- **7th Place** among 72 team in Window Cleaner Robot Competition, Iran, 2018
- **Top 1%** in the National University Entrance Exam (approx. 170,000 participants), Iran, 2016

Skills

- **Mechanical Design:** SolidWorks, CATIA
- **FEM Analysis:** SolidWorks Simulation, Abaqus
- **Multi Physics Simulation:** ADAMS, MATLAB Simulink
- **Manufacturing and Material:** Machining, welding, Forming, Additive Manufacturing, etc.
- **Actuator Systems:** Hydraulic, Pneumatic, Electric Actuators
- **Programming:** Python, Arduino, MATLAB
- **Automation Tool:** EPLAN, TIA Portal
- **Programmable Hardware:** PLCs (Siemens S7 Series), Raspberry Pi, Arduino
- **Other Software:** LaTeX, MS Office, MS Project
- **Soft Skills:** Teamwork, Innovation, Dedication, and Problem-Solving mindset

Languages

English ●●●●○
- TOEFL iBT: 93/120

Persian (Farsi) ●●●●●
- Native

Projects

Programming:

- **Six Degree of Freedom Motion Simulator (Hexapod) with 2.2 Ton Payload Capacity,** 2023 - 2024
  - Kinematics/dynamics modeling, PLC programming (Siemens S7-1517), servo driver integration (Lenze i950), and HMI design. (at DSDA)
- **Autonomous Drywall Installation Robot,** 2024
  - Electrical component selection, programming, and interface development. (at RebuildRobotics)
- **DM45 Blasthole Drill Renovation,** 2024
  - Designed a GPS-based HMI navigation system for drilling precision and monitoring. (at DSDA)
- **Pipeline Inspection Robot**, 2023
  - Involved in design, simulation, and prototyping. (at DSDA)
- **Pellet Size Monitoring System**, 2022
  - As a R&D project, developed image processing algorithms for iron ore pellet detection. This project had been leaded to production. (at DSDA)
- **Conveyor Belt Monitoring System**, 2022
  - As a R&D project, implemented defect detection via image processing and segmentation techniques using artificial intelligence. This project had been leaded to production. (at DSDA)
- **2-DOF Parallel Robot Control**, 2018
  - Involved in developing control algorithms and programming (at Taarlab)
- **Multi-Continuum Robotic Arm**, 2021
  - Self-initiated project on design and control (self-experience)

Modeling kinematic and dynamic:

- **Six Degree of Freedom Motion Simulator (Hexapod) with 2.2 Ton Payload Capacity,** 2023 - 2024
  - Kinematics/dynamics modeling, PLC programming (Siemens S7-1517), servo driver integration (Lenze i950), and HMI design. (at DSDA)
- **Stationary Rock Breaker System,** 2024
  - Kinematics/dynamics modeling of 4 linked-arm with 4 degrees of freedom, using MATLAB and ADAMS. (at DSDA)
- **Six Degree of Freedom Racing Car Motion Simulator (Hexapod) with 150 kg Payload Capacity,** 2024
  - Mathematical modeling and 3D CAD design using SolidWorks. (at DSDA)

CAD Design:

- **Six Degree of Freedom Racing Car Motion Simulator (Hexapod) with 150 kg Payload Capacity,** 2024
  - Mathematical modeling and 3D CAD design using SolidWorks. (at DSDA)
- **Camera and Illumination Housing for Harsh Environments,** 2024
  - Designed stainless steel enclosures for mining applications. These designs have been used in two projects of company so far, **Pellet Size Monitoring and Control System** and **Conveyor Belt Monitoring System** (at DSDA)
- **Pipeline Inspection Robot**, 2023
  - Involved in design, simulation, and prototyping. (at DSDA)
- **FDM 3D Printers (Cartesian & Core-XY)**, 2019
  - Designed and built (at IUST)

Publications

• Ansari Rad, S., Ghafarian Tamizi, M., **Mirfakhar, A.**, Masouleh, M. T., & Kalhor, A.; **Control of a two-DOF parallel robot with unknown parameters using a novel robust adaptive approach**. ISA Transactions, 117, 70–84, https://doi.org/10.1016/j.isatra.2021.02.001, 2021

• Ghasemi, H., **Mirfakhar, A.**, Masouleh, M. T., & Kalhor, A.; **Control a Drone Using Hand Movement in ROS Based on Single Shot Detector Approach**. 2020 28th Iranian Conference on Electrical Engineering (ICEE)., https://doi.org/10.1109/icee50131.2020.9260864, 2020