

Ali Mousavi

Mechanical Engineer



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🌐 LinkedIn
🎓 KU Leuven
🔗 Google Scholar
🐙 GitHub

PERSONAL SKILLS

- Team player
- Planning
- Organization
- Result oriented
- Problem solving
- Analytical skills
- Fast learner

TECHNICAL SKILLS

- MATLAB & Simulink (real-time robot control, data analysis)
- Python (off-line and on-line data analysis)
- ROS (robot programming and visualization in RVIZ)
- PyBullet (robot programming of contact tasks)
- SOLIDWORKS (CAD, FEA, Motion Analysis)
- ABAQUS (FEA)

LANGUAGES

- English: Fluent
- Dutch: Beginner
- Persian: Native proficiency

REFERENCES

- Joris De Schutter
(joris.deschutter@kuleuven.be)
- Erwin Aertbeliën (erwin.aertbelien@kuleuven.be)
- Maxim Vochten
(maxim.vochten@mil.be)

ABOUT ME

I am a mechanical engineer with knowledge in kinematics, dynamics, robotics, and control. I have hands-on experience in designing machines and robots, as well as in robot programming, such as learning from demonstration for tasks with robot-environment interaction. With a practical mindset, I aim to use my skills and research to solve real industrial problems.

EDUCATION

PhD in Mechanical Engineering (2019 – 2025)

KU Leuven, Belgium 📍

Master in Mechanical Engineering (2013 – 2016)

University of Mashhad, Iran 📍

Bachelor in Mechanical Engineering (2009 – 2013)

University of Mashhad, Iran 📍

EXPERIENCE

Research Engineer (2019 – present)

KU Leuven, Belgium 📍

- Controlling robots in physical contact with the environment using a constraint-based controller (ROS, OROCOS, eTaSL in Lua and Python)
- User-friendly trajectory generation for contact-rich tasks with a novel learning-from-demonstration technique
- Working with 6-axis force/torque sensors and motion capture systems
- Developing toolboxes in MATLAB and Python for easier robot programming
- Attending international industrial conferences and workshops

Mechanical Engineer: (2018 – 2019)

TGT Company, Iran 📍

- Die design for heat exchanger gaskets and plates in SOLIDWORKS using CMM point clouds
- Structural design of heat exchangers in SOLIDWORKS
- Preparing technical drawings and BOMs
- Making as-built drawings

Research Engineer: (2013 – 2018)

University of Mashhad, Iran 📍

- Shared-control trajectory generation with admittance control for welding in MATLAB/Simulink
- Mechanical design of robots in SOLIDWORKS
- Kinematic and dynamic analysis in SOLIDWORKS Motion Analysis
- Kinematic/dynamic robot design and analysis in MATLAB
- Attending industrial conferences

OTHER PROJECTS

Research Engineer (2019 – present)

- Applying Iterative Learning Control (ILC) to robotic tasks that involve physical contact with environment to expedite tasks (ROS, OROCOS, eTaSL)
- Estimating mass, center of mass, and 6-axis force/torque sensor offsets from force and moment measurements in simulation and real world (MATLAB and Python)
- Shared control for an assembly task in a human-robot collaboration scenario
- Spline-based optimal trajectory generation for a linear motor
- Simulating a 2-D Contour Following task in PyBullet using a constraint-based controller

Mechanical Engineer: (2018 – 2019)

- Mechanical design of an electric well inspection winch system for water wells using SOLIDWORKS

Research Engineer: (2013 – 2018)

- Designed a linear electric actuator for integration into a car simulator based on a Stewart platform using SOLIDWORKS
- Performed kinematic and dynamic optimization of a Stewart platform for improved motion performance USING MATLAB and Genetic Algorithm (GA)
- Developed the mechanical design of an active physiotherapy robot for knee rehabilitation using SOLIDWORKS
- Conducted finite element analysis (FEA) of mechanical components using ABAQUS
- Designed and simulated fuzzy and sliding mode controllers for a 6-DOF robotic arm using MATLAB

CONFERENCE & JOURNAL PAPERS

- Estimating the Sensor Offsets and Gravity Parameters Using only Wrench Measurements
- Automatic Derivation of an Optimal Task Frame for Learning and Controlling Contact Tasks
- Invariant Descriptors of Motion and Force Trajectories for Interpreting Object Manipulation Tasks in Contact
- Real-time velocity scaling and obstacle avoidance for industrial robots using fuzzy dynamic movement primitives and virtual impedances
- A real-time impedance-based singularity and joint-limits avoidance approach for manual guidance of industrial robots
- Fuzzy impedance control strategy for jaw rehabilitation using 6-UPS Stewart robot
- Design and construction of a linear-rotary joint for robotics applications
- Repeatability analysis of a SCARA robot with planetary gearbox
- Design of an economical SCARA robot for industrial applications