



Aran Mohammad

Robotics and Machine-Learning Engineer

✉ aranmoham@gmail.com | 🌐 aranmoha.github.io/cv/ | 📅 18.10.1993

Experience

Research Associate, Institute of Mechatronic Systems, Hanover, Germany Mar 2021 – Present

- Developed open-source methods in MATLAB and Python for perception and safety in robotics
- Created solutions in interaction control, modeling, ML-based classification and transfer learning
- Authored 5 publications incl. best paper; co-chaired and presented at major robotics conferences (ICRA, IROS)
- Co-secured €400k grant for robotics-ML project on sensor fusion, time series modeling and motion control
- Taught course (150 students) on robotics, optimization, vision-based control, machine and motion learning
- Supervised 23 theses and guided 17 students in above listed research and lecture projects

Research Intern and Master Student, IAV GmbH, Gifhorn, Germany Mar 2020 – Nov 2020

- Developed emission models via physics-based ML (grade: 1.0); published in journal and conference

DAAD-Funded Research Intern, UNESP, Bauru, Brazil Oct 2019 – Dec 2019

- Analyzed CFRP structures in frequency-domain using piezoelectric membranes and MATLAB

Tutor in Control and Modeling, Leibniz University Hannover, Hanover, Germany Nov 2014 – Jan 2018

- Co-supervised courses with 50 students on control, kinematics and dynamics
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Projects

Implemented Robot-Agnostic Communication System 🌐 [aranmoha/testbench](#)

- Designed real-time communication using EtherCAT and Simulink for kinematics, dynamics, and logic modeling
- Implemented code base that deployed in 7 cross-industry testbeds
- Integrated camera, force and inertial sensors via Python, C++ and ROS for sensor fusion and motion planning

Developed Contact-Detection and Reaction Framework for Safe Robots 🌐 [aranmoha/safepr](#)

- Implemented real-time robot algorithms combining detection, classification, and reaction to contacts
- Validated redundancy-based control in software-in-the-loop and real-world tests
- Combined physical modeling with machine learning in Python and implemented online prediction in MATLAB
- Extended with domain randomization and domain-adversarial training for sim-to-real transfer

Co-Designed Teaching Courses for Undergraduate and Graduate Students

- Implemented inverted-classroom teaching and interactive workshops in 150-student course on robotics and ML
 - Co-guided a 6-student team in lecture projects, including technical supervision and task tracking
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Skills

Software: MATLAB/Simulink, Python, C++, ROS, Autodesk Inventor, MS Office, Git, DaVinci Resolve

Libraries: scikit-learn, PyTorch, Tensorflow, MuJoCo, OpenCV, SciPy

Languages: German, Kurdish, English

Education

Dr.-Ing. in Robotics and ML, Leibniz University Hannover, Hanover, Germany Mar 2021 – Present

M.Sc. in Mechanical Engineering (grade: 1.0, distinction), LUH, Hanover, Germany Oct 2017 – Dec 2020

B.Sc. in Mechanical Engineering (grade: 2.2), LUH, Hanover, Germany Apr 2014 – Sept 2017

Engineering and Business Administration, LUH, Hanover, Germany Oct 2012 – Mar 2014

Achievements

Best-paper award at robotics workshop, M.Sc. with distinction (grade: 1.0), Dean's List honoree

Selected Publications (Google Scholar)

- [1] A. Mohammad, M. Schappler, T. -L. Habich and T. Ortmaier, "Safe Collision and Clamping Reaction for Parallel Robots During Human-Robot Collaboration", 2023 IEEE/RSJ IROS, [DOI](#)
- [2] A. Mohammad, M. Schappler and T. Ortmaier, "Towards human-robot collaboration with parallel robots by kinetostatic analysis, impedance control and contact detection", 2023 IEEE ICRA, [DOI](#)
- [3] A. Mohammad, H. Muscheid, M. Schappler and T. Seel, "Quantifying Uncertainties of Contact Classifications in a Human-Robot Collaboration with Parallel Robots", 2023 Human-Friendly Robotics, Springer Proceedings in Advanced Robotics, [DOI](#)