Mahrokh Ghoddousi Boroujeni

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About me

I am a PhD candidate at École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, working at the intersection of machine learning and control. My research focuses on learning models and controllers from limited and noisy data, with theoretical guarantees on performance and stability. I am experienced in mathematically formulating problems and developing principled solutions, supported by extensive numerical simulations.

Education

EPFL, PhD Candidate in the Robotics and Intelligent Systems Doctoral School — Lausanne, Switzerland, Nov. 2020 – Nov. 2025

- Supervised by Prof. Giancarlo Ferrari-Trecate and Prof. Andreas Krause
- Completed 40 credits in advanced coursework on Control Theory and Machine Learning (Transcript)

Sharif University of Technology, B.Sc. in Electrical Engineering and Computer Science — Tehran, Iran, Sep. 2015 – July 2020

- Dual-degree program in Electrical Engineering (Control specialization) and Computer Science
- Thesis: *Camera-Based Real-Time Autonomous Racing Cars*, supervisor: Prof. Amin Rezaeizadeh
- GPA: 18.45/20; ranked top in the Control group (Transcript)

Honors and Awards

Outstanding Student Paper Award, *IEEE Conference on Decision and Control (CDC)*, 2024
For the paper *A PAC-Bayesian Framework for Optimal Control with Stability Guarantees.* Awarded to 3 out of 1000 first-author students, based on the paper's originality, clarity, and potential impact.

E3 Fellowship, EPFL, 2019
Awarded as part of a competitive undergraduate research program (acceptance rate < 2%).

Top 0.1% Nationwide, *Iranian National University Entrance Exam*, 2015
Ranked 164th out of over 182,000 participants.

Selected Publications

M. G. Boroujeni, C. L. Galimberti, A. Krause, and G. Ferrari-Trecate. A PAC-Bayesian Framework for Optimal Control with Stability Guarantees. *IEEE Conference on Decision and Control (CDC)*, 2024. PDF

A. Abyaneh, **M. G Boroujeni**, H. Lin, and G. Ferrari-Trecate. Contractive Dynamical Imitation Policies for Efficient Out-of-Sample Recovery. *International Conference on Learning Representations (ICLR)*, 2025. PDF

M. G. Boroujeni, A. Krause, and G. Ferrari-Trecate. Personalized Federated Learning of Probabilistic Models: A PAC-Bayesian Approach. *Transactions on Machine Learning Research*, 2025. PDF

Research Internships

Movement Generation and Control Lab, Max Planck Institute for Intelligent Systems — Tübingen, Germany, March 2020 – Sept. 2020

- Developed a unified framework for walking and running in torque-controlled biped robots, and collaborated on its deployment on real hardware (publication)
- Supervisors: Prof. Ludovic Righetti, Prof. Majid Khadiv

Photovoltaics and Thin Film Electronics Lab, EPFL — Neuchâtel, Switzerland, June 2019 – Sept. 2019

- Investigated power flow optimization across photovoltaic cells, electric vehicles, batteries, and buildings to enhance solar energy integration
- Supervisor: Dr. Nicolas Wyrsch

Automatic Control Lab (IfA), ETH Zürich — Zürich, Switzerland, July 2018 – Sept. 2018

- Designed an adaptive electricity pricing mechanism that preserves the differential privacy of household occupancy data (publication)
- Supervisor: Prof. Maryam Kamgarpour

Skills

Machine Learning	Meta and federated learning; generalization bounds; imitation learning; probabilistic inference (e.g., variational methods, MCMC) and modeling (e.g., Gaussian processes, Bayesian networks, Markov models); neural networks (recurrent, convolutional, adversarial)
Control and Systems	Learning-based control; stability guarantees; system identification; stochastic systems; networked control systems
Programming	Expert in Python, MATLAB, Java, and R; familiar with C++, Bash, CodeVision
Research and Communication	Scientific writing and presentation; student supervision and mentoring; cross-disciplinary collaboration (robotics, energy systems, photovoltaics)
Languages	Persian (native), English (fluent), French (conversational)

Teaching and Supervision

Teaching Assistant, EPFL — Lausanne, Switzerland, Sept. 2021 – Nov. 2025
Assisted in courses: Multivariable Control, Networked Control Systems, and Control Systems. Responsibilities included designing assignments and projects, grading exams, holding exercise sessions, and supporting hands-on labs.

Student Supervision, EPFL — Lausanne, Switzerland, Sept. 2021 – Nov. 2025
Supervised semester-long research projects. Proposed project topics, provided technical resources, and guided students through all phases of research and implementation.

Teaching Assistant, Sharif University of Technology — Tehran, Iran, Sept. 2017 – July 2020
Assisted in courses: Artificial Intelligence and Biological Computation, Modern Control, Signals and Systems, Electrical Energy Conversion, and Numerical Computation. Responsibilities included designing assignments and holding exercise and exam prep sessions.

Mathematics Olympiad Teacher, Farzanegan High School — Tehran, Iran, Sept. 2015 – Sept. 2016
Taught mathematics and problem-solving strategies to students preparing for national Olympiads.

Volunteer Teacher, Local Orphanage — Tehran, Iran, Sept. 2015 – July 2016
Provided academic support to underserved students preparing for college. Gained experience in inclusive education, adapting to the needs of students with learning difficulties.