Mahrokh **Ghoddousi Boroujeni**

PhD Student · Robotics and Intelligent Systems

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Education

École Polytechnique Fédérale de Lausanne
Lausanne, Switzerland

Doctoral student in Robotics and Intelligent Systems
November 2020 - Present

- Supervisor: Prof. Giancarlo Ferrari Trecate, DECODE, EPFL
- Co-supervisor: Prof. Andreas Krause, LAS, ETHZ
- Project: leveraging machine learning algorithms for controlling complex systems
- Expected graduation: November 2025

Sharif University of Technology
Tehran, Iran

B.Sc. in Electrical Engineering
B.Sc. in Computer Science (dual degree)
September 2015 - July 2020

- GPA: 18.45
- Thesis: Camera-Based Real-Time Autonomous Racing Cars. Video processing with OpenCV and a high-performance C++ hardware interaction.

Farzanegan Middle and High Schools
Tehran, Iran

High School Diploma in Mathematics and Physics
September 2008 - June 2015

- Associated with the National Organization for Development of Exceptional Talents

Publications

- M. G. Boroujeni, C. L. Galimberti, A. Krause, and G. Ferrari-Trecate, "A pac-bayesian framework for optimal control with stability guarantees," 2024, pdf.
- M.G.Boroujeni, A.Krause, and G.Ferrari-Trecate, "Personalized federated learning of probabilistic models: A PAC-Bayesian approach," 2024, pdf.
- M. Ghoddousi Boroujeni, E. Daneshmand, L. Righetti and M. Khadiv, "A Unified Framework for Walking and Running of Bipedal Robots," 2021 20th International Conference on Advanced Robotics (ICAR), Ljubljana, Slovenia, 2021, pdf.
- M. Ghoddousi Boroujeni, D. Fay, C. Dimitrakakis and M. Kamgarpour, "Privacy of Real-Time Pricing in Smart Grid," 2019 IEEE 58th Conference on Decision and Control (CDC), Nice, France, 2019, pp. 5162-5167, pdf, slides.

Research Internships

Movement Generation and Control Laboratory, Max Planck Institute for Intelligent Systems
Tübingen, Germany

Project Title: Implementing Highly Dynamic Motions on a Torque-Controlled Biped Robot
March 2020 - September 2020

- Supervisors: Prof. Majid Khadiv and Prof. Ludovic Righetti.
- Performing agile parkour-like movements on a biped robot employing model predictive control methodologies.

Photovoltaics and Thin Film Electronics Laboratory, EPFL
Neuchâtel, Switzerland

Project Title: Synergy Between Electromobility and Photovoltaic for Grid Integration
June 2019 - September 2019

- Supervisor: Dr. Nicolas Wyrsch.
- Power flow optimization between photovoltaic cells, electric vehicles, batteries, a house, and the grid using Mixed Integer Linear Programming.

Automatic Control Laboratory (IfA), ETH
Zürich, Switzerland

Project Title: Privacy of Real-Time Pricing in Smart Grid
July 2018 - September 2018

- Supervisor: Prof. Maryam Kamgarpour.
- Developing a differentially private mechanism to adaptive publish electricity rates while keeping the households' occupancy private.

Work Experience

Student Supervision
Lausanne, Switzerland

École Polytechnique Fédérale de Lausanne
February 2021 - Present

- Supervising M.Sc and B.Sc students for conducting research projects during one semester.

Teaching Assistant
Lausanne, Switzerland

École Polytechnique Fédérale de Lausanne
February 2021 - Present

- Courses: Networked Control Systems, Multi-variable Control, Control Systems.

Teaching Assistant *Tehran, Iran*

Sharif University of Technology *October 2017 - July 2019*

- Courses: Artificial Intelligence and Biological Computation, Modern Control, Signals and Systems, Electrical Energy Conversion, Numerical Computation.

Chairman of IEEE Student Branch *Tehran, Iran*

Sharif University of Technology *May 2017 - May 2018*

Mathematics Olympiad Teacher *Tehran, Iran*

Iranian Young Scholars' Club, Farzanegan High School *June 2016 - April 2017*

Skills

Programming languages

- Expert in Matlab, Python, Java, R.
- Familiar with C/C++, Assembly (MIPS), Verilog HDL, CodeVision AVR.

Machine Learning and Artificial Intelligence

- Probabilistic Modeling
- Reinforcement Learning
- Meta and Federated Learning
- Genetic Algorithms
- Generalization Bounds
- Computer Vision

Micro-Controllers

- ATmega family
- Arduino boards

Electrical Design and Simulation

- Simulink
- Altium Designer DXP
- PSpice, HSpice

Tools

- Git
- SQL
- Latex

Languages

- Persian (native)
- English (TOEFL 114 out of 120)
- French (B2 level)

Honors & Awards

International

2019 **E3 Fellowship by the EPFL University,** a selective research fellowship with an acceptance rate of less than 2% to do a research internship at EPFL. *Lausane, Switzerland*

Domestic

2015 **164th Place,** National University Entrance Exam with 182000 participants. *Tehran, Iran*

2015 **Graduated,** National Organization for Development of Exceptional Talents middle and high schools. *Tehran, Iran*

2012-2014 **Finalist,** National Mathematics Olympiads. *Iran*

Service

Teaching at an orphanage *Tehran, Iran*

By teaching on my weekends for approximately six months, I tried to help prepare deprived students for university and practice being patient and understanding at all times, particularly when dealing with learners who have special needs or learning difficulties.

Voluntary teaching at high school *Farzanegan high school*

To enhance my ability to explain a concept in a variety of ways.

Self-coordinated exam preparation sessions *Sharif University*

Covered courses Mathematics 1, Engineering Math, and Digital Control in different semesters.