# Arash Bahari Kordabad - CV


CONTACT & PERSONAL INFORMATION

*E-mail:* arashbk@mpi-sws.org
Arashbahari20@gmail.com
*Homepage:* `https://arashbaharik.github.io/`
*Tell:* (+47) 48406162
*Date and Place of Birth:* Feb.10,1995, Tabriz, Iran
*Nationality:* Iranian
*Marital Status:* Married


RESEARCH INTERESTS

Control Theory, Reinforcement Learning, Optimal Control, Model Predictive Control

EDUCATION

**Max Planck Institute for software systems**, Kaiserslautern, Germany

Postdoctoral Researcher, **May.2023 - present**

- Topic: "Multi-agent awareness and control with temporal logic specifications"
- Supervisor: Prof. Sadegh Soudjani

**Norwegian University of Science and Technology(NTNU)**, Trondheim, Norway

Ph.D., Department of Engineering Cybernetics **Feb.2020 - April.2023**

- Thesis Topic: "Theoretical properties of Learning-based MPC"
- Supervisor: Prof. Sébastien Gros
- Co-Supervisor: Prof. Anastasios Lekkas

**Sharif University of Technology**, Tehran, Iran

M.S., Department of Mechanical Engineering **Sep.2017 - Sep.2019**

- Thesis Topic: "Control of Bifurcation and Chatter Suppression in Peripheral Milling Process"
- Supervisor: Prof. Hamed Moradi
- GPA: 19.41/20

**University of Tabriz**, Tabriz, Iran

B.S., Department of Mechanical Engineering **Sep.2013 - Sep.2017**

- Thesis Topic: "On the Muscle Models as Viscoelastic Material and Comparison of Force-Length Models for Active Skeletal Muscle"
- Supervisor: Prof. Kamal Jahani
- GPA: 18.1/20

HONORS AND AWARDS

Having received the honour as the First rank of Mechanical Engineering at Sharif University of Technology **2018**

Present among 40 top Mechanical Engineering students from all over the country. (Scientific Olympiads for university student) **2017**

Ranked Five among 99 Mechanical Engineering students in Bachelor Degree. **2017**

Ranked top 0.2 of 250,000 participants ($669^{th}$) in the National Universities Entrance Exam known as "KONKOOR" for B.Sc. degree. **2013**

SELECTED COURSES

| | | |
|---|---|---|
| Advanced Nonlinear Systems (PhD course) | Numerical Optimal Control (PhD course) | |
| Intelligent Systems:19.3/20 | Nonlinear Control:19.3/20 | Robust Control:19.3/20 |
| Advanced Mathematics:20/20 | Stochastic Control:19.4/20 | Advanced Dynamics:19.9/20 |
| Automatic Control:20/20 | Modern Control:18.9/20 | Robotic:20/20 |

## Academic Experience

*Guest PhD* **2021/11-2022/6**
Electrical and Electronic Engineering, Aalborg University, Aalborg, Denmark, with Prof. Wisniewski. Research area: Safe RL

*Teaching Assistant* **2018**
Automatic Control course for Undergraduate students at Sharif University of Technology.

*Intelligent Systems Project* **2018**
Solving Traveller Salesperson using the Continuous Genetic Algorithm, M. Broushaki.

*Modern Control Project* **2017**
Designing Luenberger Observer and Pole Placement Control for the Dual Inverse Pendulum in the state of Continuous and Discrete time, H. Salarieh.

*Dynamic of Machinery Project* **2015**
Design of Four-bar Linkage for Path Following, M. Ettefagh.

## Journal Publications

- **Bahari Kordabad, A.**, Gros, S. (2023). "Lyapunov-based robust optimal control for time-delay systems with application in milling process", *International Journal of Dynamics and Control*, [accepted].
- W. Cai, **Bahari Kordabad, A.**, Gros, S. (2023). "Energy Management in Residential Microgrid Using Model Predictive Control-based Reinforcement Learning and Shapely Value". *Engineering Applications of Artificial Intelligence*.
- **Bahari Kordabad, A.**, Zanon, M., Gros, S. (2022). "Equivalence of Optimality Criteria for Markov Decision Process and Model Predictive Control". *IEEE Transactions on Automatic Control* . [accepted]
- Nejatbakhsh Esfahani, H., **Bahari Kordabad, A.**, Cai, W., and Gros, S. (2022). "Learning-based State Estimation and Control using MHE and MPC Schemes with Imperfect Models", *European Journal of Control*, [Submitted]
- Seel, K., **Bahari Kordabad, A.**, Gros, S., Gravdahl, J.T. (2022). "Convex Neural Network-based Cost Modifications for Learning Model Predictive Control". *IEEE Open Journal of Control Systems* .
- **Bahari Kordabad, A.**, Wisniewski, R., Gros, S. (2022). "Safe Reinforcement Learning Using Wasserstein Distributionally Robust Model Predictive Control". *IEEE access*.
- **Bahari Kordabad, A.**, Gros, S. (2022). "Q-Learning of the Storage Function in Economic Nonlinear Model Predictive Control" .*Engineering Applications of Artificial Intelligence* , 116, p.105343.
- **Bahari Kordabad, A.**, Boroushaki, M. (2019). "Emotional Learning Based Intelligent Controller for MIMO Peripheral Milling Process". *Journal of Applied and Computational Mechanics*, 6(3), 480-492.

## Conference Publications

- **A. Bahari Kordabad**, and S. Gros, "Continuous-time Chance-constrained Stochastic Model Predictive Control using Multiple Shooting and CVaR", *2023 European Control Conference (ECC)*, 2023.
- **A. Bahari Kordabad**, and S. Gros, "Bias correction of discounted optimal steady state using cost modification", *2023 European Control Conference (ECC)*, 2023.
- **A. Bahari Kordabad**, and S. Gros, "Functional stability of discounted MDPs using Economic MPC dissipativity theory", *2022 European Control Conference (ECC)*, 2022.
- **A. Bahari Kordabad**, H. Nejatbakhsh Esfahani, W. Cai, and S. Gros, "Quasi-Newton Iteration in Deterministic Policy Gradient", *2022 American Control Conference (ACC)*, 2022.

- W.Cai, H. Nejatbakhsh Esfahani, **A. Bahari Kordabad**, and S. Gros, "Optimal Management of the Peak Power Penalty for Smart Grids Using MPC-based Reinforcement Learning", *60th Conference on Decision and Control (CDC)*, 2021.
- W.Cai, **A. Bahari Kordabad**, H. Nejatbakhsh Esfahani, A. M. Lekkas, and S. Gros,"MPC-based Reinforcement Learning for a Simplified Freight Mission of Autonomous Surface Vehicles", *60th Conference on Decision and Control (CDC)*, 2021.
- **A. Bahari Kordabad**, W. Cai, and S. Gros,"Multi-agent Battery Storage Management using MPC-based Reinforcement Learning", *2021 IEEE Conference on Control Technology and Applications (CCTA)*
- **A. Bahari Kordabad**, and S. Gros, "Verification of Dissipativity and Evaluation of Storage Function in Economic Nonlinear MPC using Q-Learning", *7th IFAC Conference on Nonlinear Model Predictive Control*, 2021.
- H. Nejatbakhsh Esfahani, **A. Bahari Kordabad**, and S. Gros, "Approximate Robust NMPC using Reinforcement Learning", *2021 European Control Conference (ECC)*
- **A. Bahari Kordabad**, H. Nejatbakhsh Esfahani, and S. Gros, "Bias Correction in Deterministic Policy Gradient Using Robust MPC", *2021 European Control Conference (ECC)*
- **A. Bahari Kordabad**, W. Cai, and S. Gros, "MPC-based reinforcement learning for economic problems with application to battery storage", *2021 European Control Conference (ECC)*
- H. Nejatbakhsh Esfahani, **A. Bahari Kordabad**, and S. Gros, "Reinforcement learning based on MPC/MHE for unmodeled and partially observable dynamics", *2021 American Control Conference (ACC)*.
- **A. Bahari Kordabad**, H. Nejatbakhsh Esfahani, A. M. Lekkas, and S. Gros, "Reinforcement learning based on scenario-tree MPC for ASVs", *2021 American Control Conference (ACC)*.

| | | | | | |
|---|---|---|---|---|---|
| LANGUAGE | Persian | Turkish | English | Norwegian | Danish |

REFERENCES


Sebastien Gros
*sebastien.gros@ntnu.no*

Anastasios M. Lekkas
*anastasios.lekkas@ntnu.no*

Rafael Wisniewski
*raf@es.aau.dk*