Arash Bahari Kordabad - CV

CONTACT & PERSONAL INFORMATION

E-mail: Arash.b.kordabad@ntnu.no
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

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

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

- 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.**, Zanon, M., Gros, S. (2022). "Equivalency of Optimality Criteria of Markov Decision Process and Model Predictive Control".*IEEE Transactions on Automatic Control* . [Under Review]
- 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*. [Accepted]
- W. Cai, **Bahari Kordabad, A.**, Gros, S. (2022). "Energy Management in Residential Microgrid Using Model Predictive Control-based Reinforcement Learning and Shapely Value".*Engineering Applications of Artificial Intelligence*. [Under Review]
- **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, "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