Learning-Based Predictive Control

Chapter 0
Course Organization

Prof. Melanie Zeilinger, ETH Zurich
Prof. Lorenzo Fagiano, Politecnico di Milano
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Course information

Lecturers:	Melanie Zeilinger, *mzeilinger@ethz.ch* Lorenzo Fagiano, *lorenzo.fagiano@polimi.it* Lukas Hewing, *lukas.hewing@exploration.space*
Location:	ML H44
Lecture Materials	On Google shared folder, link in information email
Lecture Notes:	Available $\approx$ 1 day before class
Coding Exercises	Using MATLAB (Optimization and MPT-Toolbox) `https://www.mpt3.org/`
Exercise Solutions:	Available after the exercise
Attendance sheets:	Please remember to sign daily
Quiz:	On Friday 11:00 (both required for certificate)

Other information

Internet:	eduroam
Workspace:	Student work spaces in ETH buildings or cafeterias
Networking lunch:	Wednesday 28.06.23 at 12:30 in CLA Glashalle (follow signs)

Class Schedule (tentative)

Schedule of the EECI Graduate School on Learning-based Model Predictive Control

	26-06-23	27-06-23	28-06-23	29-06-23	30-06-23
Zurich Time	Monday	Tuesday	Wednesday	Thursday	Friday
09:00-10:30		Overview Learning-based MPC & Performance Learning MPC	Stochastic Model Predictive Control	Stochastic model learning	Advanced topics and research directions
10:30-11:00		BREAK	BREAK	BREAK	BREAK
11:00-12:30		Introduction to set membership estimation	Stochastic MPC based on scenario optimization	Invariance-based safe learning	Quiz Conclusions & Discussion
12:30-13:30		LUNCH	LUNCH	LUNCH	
13:30-14:00	Registration / Opening				
14:00-15:30	Introduction & Fundamentals of MPC	Adaptive MPC via on-line set membership identification	Stochastic MPC based on scenario optimization	Predictive safety filter	
15:30-16:00	BREAK	BREAK	BREAK	BREAK	
16:00-17:30	Fundamentals of MPC	Adaptive MPC via on-line set membership identification		Predictive safety filter	

Literature

There is no textbook covering all the material.

We will provide references to papers for the individual lectures.