FrontSeat | STU Slovak University of Technology in Bratislava | Ruhr Universität Bochum | RUB | Università di Pisa

Summer School 2025 on Optimization-Based Embedded Control Systems

September 1-5, 2025 — **5-day Summer School**

Ruhr-University Bochum, Germany — **FREE REGISTRATION**

This summer school provides an introduction to optimal and model predictive control (MPC) methods, with a focus on their application in embedded systems such as microcontrollers, embedded computing devices, and industrial PCs. Lectures will cover essential background in numerical optimization, introduce optimal and model predictive control, and explore state-of-the-art techniques for implementing these methods on embedded devices for real-time use. Participants should have a solid understanding of fundamental control concepts (e.g., state-space modeling, controllability, observability, and stability). Prior knowledge of optimal and predictive control or embedded programming is not required but welcome. The school will begin on Monday morning and conclude on Friday after lunch. Approximately half of the 5-day school will be dedicated to supervised and guided exercises that focus on the practical implementation of MPC on microcontrollers and embedded devices.

Highlights

- Lectures accompanied by computer and embedded hardware exercises in small teams
- Practical implementations of controllers, e.g. for mechatronic systems
- Opportunity to present your results and receive feedback in real-time

Key Speakers

Sebastian Leonow **Martin Mönnigmann** **Juraj Oravec** **Gabriele Pannocchia**

Registration deadline: July 14th, 2025. Registration is free. Seats will be limited.

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