

Invitation to the Oral Examination – Department CE

For the occasion of his examination for a Doctoral Degree,

Michael Fink, M.Sc.

will present his dissertation entitled

Optimal and Safe Control Strategies Using Set-Based Methods in Model Predictive Control under Uncertainty

on **17 April 2026** at **14:00 h (CET)**

Attendance to the presentation is open to the public. The presentation will be in English.

The candidate, all members of the Examination Committee, and authorized examiners of the TUM School of CIT are invited to the presentation and subsequent oral examination.

The presentation and subsequent examination will take place in room

Seminarraum N0116, Theresienstr. 90, 80333 München

<https://nav.tum.de/room/0101.EG.116>

Examination committee:

Chair: **Prof. Dr.-Ing. Werner Hemmert**

First Examiner: **Priv.-Doz. Dr.-Ing. habil. Marion Leibold**

Second Examiner: **Prof. Dr.-Ing. Matthias Althoff**

Garching, **April 9, 2026**

Mailing list:

Members of the examination committee

Doctoral candidate

Abstract:

MPC with constraints can be overly conservative under uncertainty or risky when allowing constraint violations. This thesis introduces Constraint Violation Probability Minimization, which optimizes violation probability to achieve a balanced trade-off between safety and performance using set-based methods. Furthermore, applications in greenhouse and vertical-farm control demonstrate safe, efficient, and time-optimal growth management for sustainable systems.