

Invitation to the Oral Examination – Department CS

For the occasion of his examination for a Doctoral Degree,

Mr. Jonathan Melchior Lukas Külz

will present his dissertation entitled/on

Modular Robot Composition Optimization for Task-Tailored Automation

on **Wednesday, 22nd of April 2026** at **13:00 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 hybrid:

online via BBB:

<https://bbb.cit.tum.de/nil-djw-hjw>

In person:

Room 00.10.011

CIT-Building, Boltzmannstr. 3, 85748 Garching

Examination committee:

Chair: **Prof. Nils Thuerey**

First Examiner: **Prof. Matthias Althoff**

Second Examiner: **Prof. Tim C. Lüth**

Garching, the 13th. of April 2026

Mailing list:

Members of the examination committee

Doctoral candidate

Abstract:

Industrial manipulators are general-purpose machines, but inflexible in dynamic environments. Modular Reconfigurable Robots promise adaptable, cost-efficient automation, yet deployment is limited due to simulation gaps and combinatorial complexity. This thesis presents a modeling framework, a composable benchmark, and a genetic optimization algorithm, enabling efficient design exploration and real-world deployment, validated through automated drilling in construction.