

Invitation to the Oral Examination – Department CE

For the occasion of his/her examination for a Doctoral Degree,

Klajd Zyla

will present his dissertation on

High-Performance and Flexible Hardware Architectures for FPGA-Based SmartNICs

on **30 April 2026** at **14:00 h**

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 **Theresienstr. 90, 80333 München** in room **N2128**.

Examination committee:

Chair: Prof. Dr.-Ing. Georg Sigl

First Examiner: Prof. Dr. Andreas Herkersdorf

Second Examiner: Prof. Dr.-Ing. Jürgen Becker

Munich, the 08 of April 2026

Mailing list:

Members of the examination committee

Doctoral candidate

Abstract:

This dissertation addresses 6G's rising traffic and computing demands by proposing FPGA-based SmartNIC architectures that balance flexibility and performance. Four solutions—FlexPipe, FlexRoute, FlexCross, and HiPerNoC—enable dynamic, low-latency packet processing through reconfigurable pipelines, crossbar switches and 2D-mesh networks-on-chip. Experiments show throughput gains up to 103% over state-of-the-art designs, reduced congestion, lower latency, and efficient FPGA resource usage.