

## Invitation to the Oral Examination – Department MATH

For the occasion of his examination for a Doctoral Degree,

**Nils Bastian Sturma**

will present his dissertation entitled

**Identifiability and Statistical Inference in Latent Variable Modeling**

on **Tuesday, September 24, 2024** 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 online via Zoom:  
<https://tum-conf.zoom-x.de/j/67070352876?pwd=3Q6qMuNraaTAciSZopfbFHDZT2hFi9.1> ,

Meeting ID: 670 7035 2876 Passcode: 493026 and in **room 2.02.01, Parking 11, 85748 Garching**.

### **Examination committee:**

Chair: Prof. Dr. Christoph Knochenhauer

First Examiner: Prof. Dr. Mathias Drton

Second Examiner: Prof. Ph.D. Niels Richard Hansen, University of Copenhagen

Third Examiner: Prof. Ph.D. Piotr Zwiernik, University of Toronto

Garching, the 11th of September 2024

### **Mailing list:**

Members of the examination committee

Doctoral candidate

### **Abstract:**

In this publication-based dissertation, we study latent variable models in parametric settings. Since latent variable models are families of marginal distributions, they generally feature a complicated geometry that may lead to identifiability issues and failures of standard inference methods. For example, the models often contain irregular points like algebraic singularities, where well-known methods such as the likelihood ratio test or Wald test are no longer valid. One contribution of this thesis is to develop a testing methodology that is valid even if the underlying model contains irregular points. The other focus of this thesis is the investigation of geometry and identifiability in certain types of linear structural equation models with latent variables.