Invitation to the Oral Examination – Department CE

For the occasion of his examination for a Doctoral Degree,

Alihan Kaplan

will present his dissertation on

Finite Gabor Frames and Data Transmission over Linear-Timevarying Channels

on **27.11.2024** at **11:30 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 a hybrid format, online via zoom: https://tum-conf.zoom.us/j/7344352474 and in room 0503.01.350

Examination committee:

Chair: **Prof. Reinhard Heckel**

First Examiner: **Prof. Volker Pohl**

Second Examiner: **Prof. Götz Pfander**

Third Examiner: **Prof. Holger Boche**

Munich, the 11th of November 2024

Mailing list:

Members of the examination committee

Doctoral candidate

Abstract:

In communications, wireless channels are often modelled as time-invariant linear (LTI) systems. However, real wireless channels have time-varying characteristics. Thus, the question arises whether it is possible to transmit data over a linear time-varying (LTV) channel without a prior estimate of channel state information (CSI). This thesis is devoted on developing methods to transmit data over LTV channels without any prior information on the CSI. In order to develop such a method a thorough understanding of LTV systems are essential. In the formal analysis of LTV systems time-frequency representations, and in particular Gabor frames, play a key role. Thus, a significant part of this thesis is dedicated on the study of finite Gabor frames and their properties. Later on, these insights are then applied in order to develop data transmission schemes over LTV channels which do not rely on previously estimated CSI.