Einladung zur öffentlichen Defensio

Mark Jason CELIZ

Thema der Dissertation

Spaces of Functions of Variable Bandwidth Parametrized by Piecewise Constant Functions

Abstract:

In this talk we investigate spectral subspaces of a Sturm-Liouville operator $f \mapsto -(pf')'$ on $\mathbb{R}$ with p a positive piecewise constant function. Elements of these subspaces can be viewed as functions having variable (local constant) bandwidths determined by $1/\sqrt{p}$. Using the spectral theory of Sturm-Liouville operators we show that direct evaluations of the reproducing kernel can be calculated, which in principle allows us to study numerical aspects of sampling and reconstruction of functions of variable bandwidth. Two concrete examples will be presented to demonstrate the computations. We also derive necessary density conditions for sampling and interpolation in these subspaces. In addition, a critical density that separates sets of stable sampling from sets of interpolation is found. We then briefly discuss a reconstruction algorithm that is based on frame theory and regularization and show that functions of variable bandwidth are much better approximated within this model than by classical bandlimited functions.

Prüfungssenat

Univ.-Prof. Mag. Dr. Andreas Cap
(Vorsitz)

Univ.-Prof. Mag. Dr. Karlheinz Gröchenig
 (Universität Wien)

Univ.-Prof. Dr.rer.nat. Jussi Behrndt
(TU Graz)

Prof. Dr. Roza Aceska
(Ball State University)

Zeit:

11. August 2022, 14:30 Uhr
Aug 11, 2022 02:30 pm Vienna

Ort:

```
Topic: Thesis defense Mark Jason Celiz
Time: Aug 11, 2022 14:30 Vienna

Join Zoom Meeting
https://univienna.zoom.us/j/64872521038?
pwd=NHp2S3ZXL0NsS1dEOVdaZjJiNUs5dz09

Meeting ID: 648 7252 1038
Passcode: 630802
```