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FAKULTÄT FÜR MATHEMATIK

Dekan:

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Einladung zur öffentlichen Defensio von

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Thema der Dissertation:

Functions of Variable Bandwidth - a Time-Frequency Approach

Abstract:

Although at first sight the idea of variable bandwidth of a function appears to have a clear meaning, the fact that there is little theoretical work on this topic indicates problems. Some natural approaches found in the literature, trying to describe the idea, e.g. by time-warping, have serious shortcomings in one or another way.

The thesis presents a new approach to the concept of variable bandwidth, based on methods from time-frequency analysis. Suitably customized weights punish only those contributions of the short-time Fourier transform which are outside of a strip describing the local bandwidth. The general coorbit theory then grants that variable bandwidth (VB) spaces are Banach spaces, and even reproducing kernel Hilbert spaces, which can be characterized by means of their Gabor expansions with respect to a large variety of Gabor frames. A particular VB space is not too sensitive to bandwidth changes, which is in line with results from applications

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