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FAKULTÄT FÜR MATHEMATIK
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Einladung zur öffentlichen Defensio von

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Thema der Dissertation:

Reproducing pairs and flexible time-frequency representations

Abstract: Frame theory has proven to be a powerful tool in many areas ranging from signal processing to quantum mechanics. There are however situations where the assumptions of frame theory are overly restrictive. This is why we introduce the concept of reproducing pairs. A reproducing pair consists of two mappings (not necessarily satisfying the frame inequalities) that generate a bounded and boundedly invertible analysis/synthesis process. This idea allows for more flexibility in the construction since one system can compensate for the deficits of the other. The absence of frame bounds however creates the problem of characterizing the mapping properties of the analysis and synthesis operators. We will show how the two mappings of a reproducing pair generate a pair of conjugate dual reproducing kernel Hilbert spaces. Moreover, starting from a single system, we give a characterization of the existence of a second mapping to form a reproducing pair. Finally, we will illustrate our findings with several examples including the Gabor system of integer time-frequency shifts.

Prüfungssenat:

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