



Einladung zur öffentlichen Defensio von
Dott.Dott.Mag. Simone Zappalà

Thema der Dissertation:

**Realizable methods in time-frequency analysis based
on spline-type constructions**

Abstract:

This talk deals with realizable biorthogonal constructions in spline-type spaces and with new characterizations of the main fixed dictionaries used in time-frequency signal analysis i.e. shift-invariant, Gabor and wavelets systems. We introduce the basic notation of locally compact groups to generalize in this frame one of the main concerns of scientific modeling and simulations using frames: Stability. The constructive nature of the proof of the main theorem enabled us to constructively realize the biorthogonal system of a given one. Then, inspired by the multiresolution analysis and the Lax equivalence for general discretization schemes, the stability of a sequence of spline-type spaces is studied. The second part of the talk explores the realizable nature of spline type space giving an unified approach to approximate versions of the fixed dictionaries: Gabor-like and multiresolution wavelet-like systems. Following this line, Gabor based time-frequency filtering is applied to the enhancement of anisotropic generalized Hough transform for the detection of the mandibular canal in digital dental panoramic radiographs. Finally, the spline-type construction is applied to the approximation of pseudo-differential operators through generalized Gabor multipliers. New computational aspects are explored: modulations' selection for overspread operators and post processing through Hough transform for time variant filters.

Prüfungssenat:

Univ.-Prof. Dr. Josef Hofbauer (Vorsitz)
(Universität Wien)

Assoz. Prof. Dr. Martin Ehler, Privatdoz.
(Universität Wien)

Prof. Dr. Clothilde Melot
(University Aix-Marseille)

Prof. Dr. habil. Darian Onchis-Moaca
(Universität Wien)

Zeit: Dienstag, 22 Mai 2018, 12:00 Uhr

Ort: Fakultät für Mathematik, Besprechungszimmer 9. Stock, Oskar-Morgenstern-Platz