universität wien

FAKULTÄT FÜR MATHEMATIK
Dekan Univ.–Prof. Dr. Harald Rindler

Einladung zur öffentlichen Defensio von

Gino Angelo Velasco, BSc, MSc

Thema der Dissertation:

Time-Frequency Localization and Sampling in Gabor Analysis

Abstract:The purpose of this research is to study time-frequency localized functions, the sampling, approximation and reconstruction of such functions in the Gabor setting, and to construct some adaptive transforms that can be applied to audio signal processing. We first investigate functions that satisfy some localization in a region in the time-frequency plane, and consider the approximation using a local Gabor system with estimates in terms of a time-frequency localization measure. Moreover, using the local Gabor system, we obtain a frame-like inequality for functions on a time-frequency localized subspace. This would allow the construction of a local system of functions that are optimally concentrated in the region, and a family of these local systems forming a global frame. We also study the random sampling of functions that are localized in a region in the time-frequency plane, wherein we determine the probability that a sampling inequality holds for time-frequency localized functions using sampling points in the region of concentration. Lastly, we present two adaptive time-frequency based transforms - via time-frequency localized subspaces and via nonstationary Gabor frames, and present their advantages in audio signal processing.

Prüfungssenat:

Assoz. Prof. Bernhard Lamel, Privatdoz. PhD (Vorsitz)
(Universität Wien)

ao. Univ.-Prof. tit. Univ.-Prof. Dr. Hans Georg Feichtinger
(Universität Wien)

Ao.Univ.Prof. Dipl.-Ing. Dr.techn. Franz Hlawatsch
(Technische Universität Wien)

Dr. Maurice de Gosson
(Universität Wien)

Zeit: Dienstag, 28. Juli 2015, 15 Uhr

Ort: Fakultät für Mathematik, Besprechungsraum 09. Stock, Oskar-Morgenstern-Platz 1