

EINLADUNG

zum

HABILITATIONSVORTRAG

Dr. Clemens Kirisits

(Fakultät für Mathematik, Universität Wien)

**“Total Variation Denoising with Rectilinear Anisotropy:
Approximation, Convergence Rates, and a Universal
Minimality Property”**

“Total Variation Denoising with Rectilinear Anisotropy: Approximation, Convergence Rates, and a Universal Minimality Property”

Abstract:

The Rudin-Osher-Fatemi (ROF) denoising model, a cornerstone of signal and image processing, consists in minimizing the total variation seminorm balanced by the squared L^2 distance to the datum. Its l^1 -anisotropic version is a natural choice for images with an underlying rectilinear geometry. Moreover, it can be particularly well approximated by piecewise polynomials on rectilinear grids. The first result we will examine more closely in this talk states that the orthogonal projection onto the space of piecewise constant functions maps subgradients of the anisotropic total variation to subgradients. This inconspicuous fact has some remarkable implications. First, it implies that the minimizer of the anisotropic ROF model is piecewise constant on a rectilinear grid, whenever the datum is. Second, the orthogonal projection is total variation diminishing, from which one obtains a convergence rate of order up to $1/2$ for the piecewise constant approximations. Third, a certain property of the approximate solutions which we call universal minimality (meaning that they simultaneously minimize a large class of convex functionals, including all p -norms, over a certain neighbourhood of the datum) carries over to the continuous setting.

Mittwoch, 19. März 2025

16:45 Uhr bis 17:30 Uhr,

Ort: HS 02, EG.

**Fakultät für Mathematik,
Oskar-Morgenstern-Platz 1**

**Michael Eichmair
Radu Bot**