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DK Seminar

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TU Wien, Freihaus, green area, 4th floor, SEM 101C

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On weighted total variation flows

In the framework of imaging science, the total variation seminorm is firmly established as a smoothness term for regularization in the inverse problems associated with the acquisition and processing of images. The main reasons behind this success are its ability to preserve discontinuities in the data, its relative simplicity, and its amenability to analysis and numerical solution by convex optimization methods.

Total variation denoising appears naturally as the implicit Euler time discretization the L^2 gradient flow of the total variation, also commonly used in applications. For this flow, a rich theory developed by Andreu, Caselles, Mazón et al. is available. There are, however, other related evolution equations in the image processing literature which cannot be formulated as a gradient flow on a Banach space.

In this talk, we will explore a few questions on the formulation of some such equations as quasivariational doubly nonlinear equations, their treatment in a metric framework, and their connection with numerically accessible time-discrete schemes.