

Title: Adaptive Wavelet Scheme for an Image Denoising Model.

Abstract: A popular method for image denoising is the total-variation-based Rudin-Osher-Fatemi model and its variants. Using a nonlinear diffusion process to preserve sharp edges while smoothing out the noise in the image, such models employ a highly nonlinear partial differential equation. In this talk, based on the framework of adaptive wavelet schemes developed by Cohen, Dahmen and DeVore for nonlinear variational problems, we apply this optimal adaptive wavelet scheme to a particular nonlinear partial differential equation studied by Nashed and Scherzer in image denoising. We established the theoretical convergence rates of the adaptive wavelet scheme for such nonlinear variational problem in any dimension. This is joint work with W. Dahmen and V. Pasyuga.