Seminar on Variational Methods in Imaging
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Edge-enhanced image reconstruction using total variation and high-order edge-preserving up-sampling operators (abstract)
Fields Institute, Room 210

We have introduced an image resolution enhancement method for multidimensional images based on a variational approach that uses the total variation norm as regularizing functional. Given an appropriate down-sampling operator, the reconstruction problem is posed using a deconvolution model under the assumption of Gaussian noise. In this research work we explore different edge preserving up/down-sampling operators with different orders of spatial accuracy. The operators are defined using nonlinear local functions to preserve edges automatically when they are present. We analyze the behavior and robustness of those operators under noisy data. Numerical results are presented using those operators in conjunction with our variational model for image enhancement.