

A FINITE ELEMENT NONOVERLAPPING DOMAIN DECOMPOSITION METHOD WITH LAGRANGE MULTIPLIERS FOR THE DUAL TOTAL VARIATION MINIZATIONS

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ABSTRACT

Total variation regularization is a standard technique for variational image processing. In this talk, we consider a primal-dual domain decomposition method for the total variation regularized problems. The Fenchel-Rockafellar dual of the model problem is transformed into an equivalent constrained minimization problem by tearing-and-interconnecting domain decomposition. Then, the continuity constraints on the subdomain interfaces are treated by introducing Lagrange multipliers. The resulting saddle point problem is solved by the first order primal-dual algorithm. We apply the proposed method to image denoising, inpainting, and segmentation problems with either L^2 -fidelity or L^1 -fidelity. Numerical results are presented.