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Transport metrics in image and shape processing

The flat norm as image fidelity

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Abstract: We investigate the use of the flat norm from geometric measure theory as image fidelity. In particular, we study the properties of solutions to a Tikhonov regularised variational problem with total variation regulariser. We point out connections of the approach to Meyer's G-norm and to Wasserstein distances. The latter yields another name for our fidelity: the Kantorovich-Rubinstein norm. Numerical examples exhibit interesting features and favourable performance for denoising and cartoon-texture decomposition. (Joint work with J. Lellmann, D. Lorenz, and C.-B. Schönlieb.)