Transport metrics in image and shape processing

Cartoon-Texture-Noise decomposition with transport norms

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Abstract: We investigate the problem of decomposing an image into three parts, namely a cartoon part, a texture part and a noise part. We argue that norms originating in the theory of optimal transport should have the ability to distinguish certain noise types from textures. Hence, we present a brief introduction to optimal transport metrics, especially the Kantorovich-Rubinstein norm, and show their relation to previously proposed texture norms, e.g. Meyer's G-norm. We propose different variational models and investigate their performance.