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A Tensor-based Nonlocal Total Variation Model for Multi-channel Image Recovery

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Highlights

- We define a new nonlocal total variation using a tensor nuclear norm (TenNLTV) and this total variation can simultaneously exploit the local structural image regularity, the nonlocal image self-similarity, and the image channel correla- tion.
- We present an image restoration model using the proposed TenNLTV. Then, an effective algorithm is designed for this framework using the variable-splitting strategy and the alternative direction methods of multipliers (ADMM).
- A subproblem in our algorithm involves a two-order complex eigen system, and a closed-form solution is derived for this system, which can lead to an algorithm acceleration.
- Extensive experimental results on several inverse imaging problems demon- strate that the proposed regularizer is systematically superior over other com- peting local and nonlocal total variation approaches, both quantitatively and visually.

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