Good Similar Patches for Image Denoising (Poster)

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Good Similar Patches for Image Denoising
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Overview: Better similar patches → better denoising results

- Patch-based denoising algorithms have achieved outstanding performance.
- The key idea is to exploit the recurrence of similar patches in input images.
- Traditional Nearest Neighbour Search can select patches with similar noise patterns to the reference patch and retain them in the denoising results.
- Better patch searching scheme could be exploited to boost the performance of patch-based image denoising techniques, such as BM3D, PLOW, LPCA.

- A good patch searching approach should (c) be able to distinguish valid similar patches and outliers by classifying them into different sub-groups, (d) select similar patches that are closest to the patch group center rather than the noisy reference.

Good Similar Patch Searching (Methodology)

- Unreliable pixel estimation: truncated mean, adaptive threshold.
- Clustering optimization: solve clustering and cluster number simultaneously.

$MDL(K, \theta) = -\log p(Q|K, \theta) + \lambda L \log(\text{mn})$

$-\log p(Q|K, \theta) = \sum_{k=1}^{K} \log |Q_k|$

$L = K(1+n+(n+1)n/2)-1$

Results and Discussion

- Quantitative evaluations
- Visual comparisons

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