Towards perception-aware image restoration

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Abstract

The goal is to measure the quality of image enhancement methods, such as deblurring, in terms of how well a person can perform a specific image-based task. One possible way to study this is to concentrate on the Non-Selective Pathway (NSP) of the human visual system [2]. It is known to quickly grasp the "gist" of an image; for example, whether the image shows a natural view or an urban environment. Are there differences in the performance of various inversion methods in terms of how well a human viewer can extract the gist from a reconstructed image? If so, perhaps sparsity-promoting inversion using Gabor-patch like building blocks performs well. A new fractal imaging method is proposed for this, based on Bayesian inversion formulated with the dual-tree complex wavelet transform [1].

References

[1] Kekkonen H, Lassas M, Saksman E and Siltanen S, *Random tree Besov priors - Towards fractal imaging.* To appear in Inverse problems and imaging.

[2] Wolfe JM, *Guided Search 6.0: An updated model of visual search. Psychonomic Bulletin & Review*, 28(4):1060–92., 2021.