# Optimal Denoising of Natural Images and the multiscale geometry and density of image patches

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Natural image denoising is a fundamental and well studied problem in image processing and low level computer vision. Recent years have seen significant advances with a variety of sophisticated mathematical methods. In this talk we shall instead consider the following question: How well can one denoise a natural image ? In other words, how accurate are the currently employed priors and how much can we expect to improve on the current state-of-the-art, with years of further research. We present a statistical framework to address this problem. We shall then show how the density and multiscale structure of natural image patches provide some interesting (partial) answers and insights on this problem.

*Joint work with Anat Levin, Fredo Durand and Bill Freeman.*