

1086-49-2463

Hayden Schaeffer*, UCLA Mathematics Department, Box 951555, Los Angeles, CA 90095, and
Stanley Osher, UCLA Mathematics Department, Box 951555, Los Angeles, CA 90095. *Sparse
texture patterns and solution to PDE.*

Sparse basis methods are able to capture a wide range of phenomena in an efficient manner. For imaging science, we use a low patch-rank decomposition to model the texture component of an image. In particular, we define a the low rank regularizer which non-locally measures the patches of an image, thus inducing patterns and structured details. Based on experimental results, we demonstrate our method's success on a wide range of textures. Our proposed regularizer is shown to better reconstruct texture for other applications such as denoising, deblurring, sparse reconstruction, pattern regularization, etc. For scientific computing, we solve non-linear and non-local partial differential equations using a sparse basis, thereby capturing the essential dynamics with a small amount of evolving coefficients. As an example, we study the method applied to the vorticity equation (Navier-Stokes) with highly oscillatory forcing terms. (Received September 25, 2012)