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Minh N. Do* (minhdo@uiuc.edu), Dept. of Electrical and Computer Engineering, Urbana, IL 61801, and **Chinh La**, Dept. of Electrical and Computer Engineering, Urbana, IL. *Compressed Sensing Beyond Sparsity*.

A recent series of remarkable work under the name of compressed sensing/compressive sampling shows that sparsity can be used as an effective prior information for signal reconstruction from limited number of measurements. However, experiences with earlier applications of sparsity such as compression and denoising show that sparsity alone does not completely capture the prior information about typical signals of interest. For example, significant wavelet coefficients of natural images tend to cluster around image edges and to be predictable from coarse-to-fine scales. Compressed sensing schemes that take advantage of these additional prior information could be even more effective. We will demonstrate this point by showing several new tree-based signal reconstruction algorithms for the wavelet representation that lead to significant better reconstruction compared to existing methods that use sparsity assumption only. (Received May 31, 2007)