

Title: Learning Sparsifying Transforms for Signal and Image Processing

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Abstract: We propose novel problem formulations and algorithms for learning sparsifying transforms from data. The algorithms are insensitive to initialization, and produce well-conditioned transforms that have much lower sparsification errors than analytical transforms such as wavelets. These transforms can also be used to construct equivalent synthesis dictionaries that provide similar/lower data fitting errors than the popular K-SVD algorithm, at 1/10th of the computational cost. Applied to image denoising the new sparsifying transforms perform better than overcomplete K-SVD dictionaries.