**Shearlet based sparse and redundant representation modeling for image processing.**

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Recently, sparse and redundant representation modeling has received extensive attention and shown to be quite effective in signal and image processing. This framework allows the successful reconstruction of the true image from severely corrupted or undersampled data provided that the true image is sparse in a certain representation system. Therefore, it is essential to use a representation system that can provide a sparse representation for true image we want to approximate in this model. In fact, the recent developments of directional representation systems offer sparse representations for multivariate data governed by anisotropic features, such as piecewise smooth objects.

In this talk, we will present some recent results on sparse and redundant representation modeling using compactly supported shearlets for various applications. In particular, our results extend previous mathematical results on inpainting and geometric separation based on this model.