

1106-VG-2067 **Arturo Vargas*** (av29@rice.edu), 6100 Main St, Houston, TX 77005. *Parameterized Spatial Transformations for Block Match based Medical Image Registration.*

The *Minimal ℓ_1 Perturbation to Block Match Data* (MILO) algorithm is a spatially accurate image registration algorithm developed for thoracic CT inhale/exhale images. The algorithm is based on three components, a Mutual Minimizing Block Matching Algorithm (MMBM), an ℓ_1 filtering step and recovering a full parameterization based on filtered data points. The algorithm has achieved high spatial accuracy despite a few drawbacks. In order to take advantage of the scattered nature of MMBM data I use a 2^d tree data structure to spatially partition the data. Radial basis functions are then centered over each leaf of the 2^d tree, thereby adaptively partitioning MMBM data. Traditionally MILO has used a uniform B-Spline parameterization. As such, it requires data defined throughout the mesh, something that is not always guaranteed with MMBM data. Furthermore, by modeling voxel displacements as quadratic functions of time I am able to extend the MILO algorithm to multiple images as opposed the traditional modeling that is limited to pairs of images. (Received September 15, 2014)