1077-65-2775   **John A.W.B. Costanzo***, abc1699@rit.edu, and **Nathan D. Cahill**. *A Survey of the Feasibility of Similarity Measures for use in Rigid Registration.*

Image registration is the process of finding a geometric transformation that brings two images into a single coordinate system. This has applications in medical imaging, whereby two three-dimensional images of the same region are aligned such that the physical areas represented in one image are linked to the corresponding areas in the other image. Rigid registration is a type of image registration in which two images can be translated and rotated in space but not distorted. The registration problem can be solved by optimizing a similarity measure relating the images over the space of valid transformations.

In this talk we discuss the application of similarity measures in rigid registration. Skerl *et al.* discuss a method by which a similarity measure can be analyzed for feasibility. This method analyzes the risk of nonconvergence, accuracy of the global minimum, distinctiveness of the global minimum, number of false local minima surrounding the optimum alignment, and maximum range that two images can be misaligned to ensure convergence. Using this method we analyzed roughly 80 similarity measures for the task of rigidly registering computed tomography (CT) and magnetic resonance (MR) images of the brain and found several that work well. (Received September 22, 2011)