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Marc Niethammer* (mn@cs.unc.edu), Department of Computer Science, Campus Box 3175, Sitterson Hall, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3175.

Predictive Image Registration. Preliminary report.

Image registration is an important tool in image analysis to spatially align pairs of images. For example, in medical image analysis, registrations to a common atlas space are frequently computed to provide a spatial reference frame for population-based analyses. Image registration approaches are typically based on a suitable model of deformation and a measure for image similarity. Deformation models range from simple affine transformations to general diffeomorphic transformations, allowing for fine-grained local deformations of space. While diffeomorphic transformations are often desired they may be costly compute. For example, while the large displacement diffeomorphic metric mapping (LDDMM) model results in diffeomorphic transformations it requires the optimization over high-dimensional spaces. This talk will therefore focus on how to learn regression models to predict deformations between images quickly. (Received September 12, 2016)