Optimal Diffeomorphic Matching in Biomedical Image Processing

Prof. Ronald H.W. Hoppe
Univ. of Houston
Houston, Texas

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Abstract

We are concerned with optimal matching of dynamically deformable curves and surfaces R3 with applications in biomedical imaging. In particular, we will focus on diffeomorphic matching which amounts to the solution of an optimization problem featuring a regularized disparity cost functional subject to a dynamical system in terms of a time-dependent family of diffeomorphisms in R3 describing the temporal deformation of the curve or surface under consideration. As an application in biomedical imaging, we will consider the optimal matching of snapshots from the mitral valve apparatus of the human heart extracted from echocardiographical data.

The presented results are based on joint work with R. Azencott, R. Glowinski, J. He, A. Jajoo, Y. Li, A. Martynenko (all U of H), and S. Ben Zekry, MD, S.A. Little, MD, W.A. Zoghbi, MD (all The Methodist Hospital Research Institute, Houston).

Graduate Students are encouraged to attend.