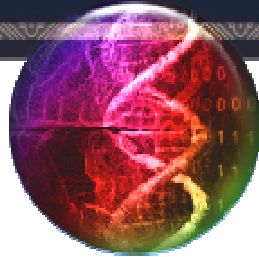


Center for
**Computational
Biology (CCB)**



Presents

Armin Schwartzman

Assistant Professor, Department of Biostatistics, Harvard School of
Public Health and Dana-Farber Cancer Institute

Thursday, July 09, 2009 at 11 AM

LONI DIVE Theater, 635 Charles E. Young Drive South, Suite 225

***Voxel-Based Group Tests of Eigenvalues and Eigenvectors
of Diffusion Tensors***

Abstract:

Diffusion Tensor Imaging (DTI) data differ fundamentally from most brain imaging data in that values at each voxel are not scalars but 3-by-3 positive definite matrices, also called diffusion tensors (DTs).

Scalar summaries of the DT do not capture all the information available in the data. For example, fractional anisotropy (FA) ignores spatial orientation. In this talk, I consider the problem of testing whether two groups of independent DTIs are equal at each voxel in terms of the DT's set of eigenvalues or frame of eigenvectors. Likelihood ratio test statistics are derived jointly assuming a tensor-valued Gaussian model.

The eigenvector test in particular has the nice property that it automatically accounts for anisotropy, almost eliminating the need for a white matter mask. The methods are illustrated on a DTI study of reading ability in children.

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