



UMass Lowell Computer Science Colloquium Announcement

Speaker: Prof. Li Shen, UMass Dartmouth
Date & Time: Wednesday, March 7, 2007, 3:00pm-4:00pm
Place: Olsen 311 (Refreshments are served at 2:40pm)

Statistical Shape Analysis of 3D Anatomical Structures

Statistical morphometric analysis is used in biomedical imaging to study various structures of interest, and aims to identify morphometric abnormalities associated with a particular condition in order to aid diagnosis and treatment. We present computational techniques for morphometric analysis of 3D surfaces to localize regionally specific shape changes between groups of 3D objects. The spherical harmonic (SPHARM) method is employed for surface modeling. We present new methods usable in three crucial steps for modeling SPHARM surfaces: (1) spherical parameterization, (2) 3D shape registration, and (3) spherical harmonic expansion. Two types of techniques are employed for statistical shape analysis of our parametric surface models: (1) linear classifiers based on a point distribution model, and (2) random field theory combined with heat kernel smoothing. We demonstrate these techniques by applying them to several studies in computational neuroscience and imaging genetics.

Bio:

Dr. Shen is an assistant professor in the Department of Computer and Information Science at University of Massachusetts Dartmouth. He received his Ph.D. in Computer Science from Dartmouth College. His research focuses on topics in geometric modeling, statistical shape analysis, biomedical imaging, and bioinformatics.