Speaker: Hemant D. Tagare, Yale University

Date: Thursday, April 12, 2007

Time: 4:30pm

Room: B205 ~ EQuad

Title: A Geometric Theory of Non-rigid Registration and Correspondence

Abstract:
Finding a non-rigid registration (or “warping”) between images and a non-rigid correspondence between boundaries of organs in an image is a fundamental problem in bio-medical image processing. In this talk, I will present a theory in which registration and correspondence problems can be put in a unifying geometric framework. A key aspect of the theory is to treat the registration or the correspondence itself as geometric object (a manifold). This point of view shows very clearly how properties of registration and correspondence algorithms are related to differential forms on the manifold and certain natural projection operators. The theory gives registration and correspondence algorithms with guaranteed properties. Further, the theory shows how shapes of curves and surfaces may be compared in a non-rigid way.

I will also present the results of this theory for registration of brain MRI images and correspondence between curves (endocardium) in sequences of heart images.

Bio:
Hemant Tagare received his Ph.D. from Rice University in 1990 in Electrical Engineering. Since then he has been at Yale University, initially as a post doc and now as tenured Associate Professor. His research interests are in bio-medical image processing. He develops algorithms and mathematical theories of image processing. His current research interests are in segmentation, registration, and shape analysis.