Applied & Computational Math Seminar

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1-2pm, HH-3017

The closest point method for manifold mapping: A numerical framework for variational problems and partial differential equations that map between manifolds

Abstract:

Maps from a manifold M to a manifold N appear in mathematical physics, image processing, computer vision, medical imaging, and many other areas. This talk introduces a numerical framework for variational problems and partial differential equations (PDEs) that map between manifolds. The problem of solving a constrained PDE between M and N is reduced into two simpler problems: solving a PDE on M and projecting onto N: The proposed algorithm uses closest point representations of M and N: This leads to a simple algorithm built on standard Cartesian grid methods that treats rather general manifold geometry. Numerical examples of denoising texture maps, diffusing random maps, and enhancing colour images are presented.