

DEPARTMENT OF COMPUTER SCIENCE  
University of Houston  
SEMINAR SPRING 2013

WHEN: MONDAY, FEBRUARY 11, 2013  
WHERE: PGH 232  
TIME: 11:00 AM

**SPEAKER:** Dr. Wei Zeng, Florida International University

Host: Dr. Zhigang Deng

**TITLE:** Ricci Flow for Shape Registration and Geometric Analysis

**ABSTRACT:**

Ricci flow has been successfully applied in the proof of Poincaré's conjecture, which deforms the Riemannian metric proportionally to the curvature, such that the curvature evolves according to a heat diffusion process. Ricci flow offers a powerful tool for shape registration and geometric analysis and has been used to tackle the following fundamental problems in engineering and biomedicine: conformal brain mapping and virtual colonoscopy in medical imaging; 3D human face registration and deformable surface tracking in computer vision; global surface parameterization in computer graphics; homotopy detection in computational topology; delivery guaranteed greedy routing and load balancing in wireless sensor network, and so on. This talk focuses on the theory of discrete surface Ricci flow, the computational algorithms and their applications in practice. The future task is to explore Ricci curvature flow on volumetric geometric data and its efficiency for real-time geometric processing tasks.

**BIO:**

Dr. Wei Zeng is an assistant professor of the School of Computing and Information Sciences at Florida International University. Dr. Zeng received her Ph.D. from Chinese Academy of Sciences in 2008 and her thesis was titled as "Computational Conformal Geometry Based Shape Analysis." Her research interests include computational conformal geometry, Teichmüller quasiconformal geometry, discrete differential geometry, discrete Ricci flow, geometric analysis, and their applications to surface matching, registration, tracking, recognition, and shape analysis. Her research areas span over medical imaging, computer vision, computer graphics and visualization, wireless sensor network, geometric modeling, and computational topology. More information can be found at: <http://www.cis.fiu.edu/~wzeng>.