

Department of Computer Science
University of Houston
Fall Seminar 2011

WHEN: Friday, September 30, 2011

WHERE: PGH 232

TIME: 11:00 AM

SPEAKER: Dr. Jianbo Shi, University of Pennsylvania

Host: Dr. Ioannis Pavlidis

Title: Attribute Flow for Discriminative Image Warping

Abstract:

We address the problem of finding deformation between two images for the purpose of recognizing objects. The challenge is that discriminative features are often transformation-variant (e.g. histogram of oriented gradients, texture), while transformation-invariant features (e.g. intensity, color) are often not discriminative.

We introduce the concept of attribute flow which explicitly models how image attributes vary with its deformation. Instead of modeling 2D spatial transformation of pixels, we compute attribute transformation on image features, such as edge orientation or histogram of oriented image gradient, in a higher dimensional space.

We develop a non-parametric method to approximate this using histogram matching, which can be solved efficiently using linear programming. Our method produces dense correspondence between images, and utilizes discriminative, transformation-variant features for simultaneous detection and alignment. Experiments on ETHZ shape categories dataset show that we can accurately recognize highly deformable objects with few training examples.

Bio:

Jianbo Shi studied Computer Science and Mathematics as an undergraduate at Cornell University where he received his B.A. in 1994. He received his Ph.D. degree in Computer Science from University of California at Berkeley in 1998. He joined The Robotics Institute at Carnegie Mellon University in 1999 as a faculty, where he lead the Human Identification at Distance (HumanID) project developing vision techniques for human identification and activity inference. In January 2003, he joined the Department of Computer and Information Science at University of Pennsylvania where he is currently an Associate Professor, and Graduate Group Chair overseeing graduate education for over 400 Master and Ph.D. students. He received National Science Foundation CAREER award in 2005, and IEEE Longuet-Higgins Prize, a contribution that has stood the test of time for his work on "Normalized Cuts and Image Segmentation" in 2007. According to Google Scholar he has over 11,000 citations for his works.