

Department of Computer Science
University of Houston

**FACULTY CANDIDATE SEMINAR
SPRING 2011**

WHEN: FRIDAY, MARCH 25, 2011
WHERE: PGH 232
TIME: 11:00 AM

SPEAKER: Rishi Saket, Princeton University

Host: Dr. Shishir Shah

TITLE: Intractability in Computational Learning and Approximation

Abstract:

This talk shall give an overview of several intractability results in computational learning, geometric optimization and graph partitioning. We first define the Probably Approximately Correct model of learning and describe our results on the hardness of learning noisy parities, two term DNFs, noisy ANDs and for the related problem of minimizing DNF expressions. In the geometric setting we obtain optimal hardness of learning intersections of two halfspaces. We illustrate how similar techniques have, in more recent work, yielded optimal results for problems in quadratic maximization and subspace approximation without assuming Khot's Unique Games Conjecture (UGC).

The latter half of the talk shall focus on limitations of semi-definite programming (SDP) relaxations for graph partitioning problems. This study is motivated by its connections to UGC and the theory of metric embeddings. We describe integrality gap constructions for strong SDP relaxations of Maximum Cut and Sparsest Cut in addition to the gap obtained in earlier work for Uniform Sparsest Cut. These integrality gaps can also be viewed as lower bounds on the distortion for embeddings in certain classes of metric spaces.

Bio:

Rishi Saket completed his B.Tech from IIT, Delhi in 2004 and his PhD in Computer Science from Georgia Tech in 2009 supervised by Dr Subhash Khot. He was a Post Doctoral Researcher at Carnegie Mellon University in 2009-10 hosted by Dr Venkatesan Guruswami and is currently a Post Doctoral Researcher at Princeton University.