

DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF HOUSTON

**FACULTY CANDIDATE SEMINAR 2012**

**WHEN:** FRIDAY, APRIL 13, 2012  
**WHERE:** PGH 232  
**TIME:** 11:00 AM

**SPEAKER:** Dr. Homin K. Lee, University of Texas at Austin

Host: Dr. Carlos Ordonez

**TITLE:** Learning Functions from Correlations

**ABSTRACT:** Massive data storage and fast processors have taken artificial intelligence from being limited to specialized applications to every-day practical use, but current systems are still rather blunt tools. In the realm of machine learning, many systems rely on gathering massive amounts of data and then simply calculating correlations. We show that there are very simple classification concepts that are impossible to learn using correlations alone.

Furthermore, we show that there are simple concepts that are not learnable even when the learner has access to the raw examples themselves. As a counterpoint, we show that correlations are sufficient to learn a subclass of polynomial-size DNF formulas, a concept class that has long been studied without much success. Finally, we end by showing that correlations are sufficient to learn the class of submodular functions.

**BIO:** Homin K. Lee is an NSF Computing Innovation Fellow at the University of Texas at Austin. He received his Ph.D. from Columbia University where he also received his M.S. and B.A. The focus of his research is computational learning theory, which lies in the intersection between the theory of computation and machine learning. His research interests also include algorithms, computational complexity, and analysis over the discrete cube.