The Department of Statistics & Actuarial Science

COLLOQUIUM- *SPRING 2015*

**PROFESSOR
ANNIE QU**

UNIVERSITY OF ILLINOIS

Title: "Weak Signal Identification and Inference in Penalized Model Selection"

Abstract: Weak signal identification and inference are very important in the area of penalized model selection, yet they are under-developed and not well-studied. Existing inference procedures for penalized estimators are mainly focused on strong signals. In this paper, we propose an identification procedure for weak signals in finite samples, and provide a transition phase in-between noise and strong signal strengths. We also introduce a new two-step inferential method to construct better confidence intervals for the identified weak signals. Both theory and numerical studies indicate that the proposed method leads to better confidence coverage for weak signals, compared with those using asymptotic inference. In addition, the proposed method outperforms the perturbation and bootstrap resampling approaches. We illustrate our method for HIV antiretroviral drug susceptibility data to identify genetic mutations associated with HIV drug resistance. This is joint work with Peibei Shi.

April 2, 2015

Reception at **3:00 p.m.,** 241-B Schaeffer Hall
Talk at **3:30 p.m.,** 61 Schaeffer Hall