Stanford University
Department of Statistics

DEPARTMENTAL SEMINAR
4:15pm, Tuesday, March 3, 2015
*** Note Special Location ***
McCullough Building 04-490 Room 115
Cookies served at 3:45pm, 1st floor Lounge.

Speaker: Asaf Weinstein
The Wharton School,
University of Pennsylvania

Title: Confidence Interval-Driven Selective Inference

Abstract:
In many areas of science, one observes $m$ independent variables $Y_i$, each corresponding to a parameter $\theta_i \in \Theta$, and the objective is twofold: the primary goal is to detect parameters that belong to each of $K$ disjoint subsets $\Theta_j \subset \Theta$; the secondary goal is, for each classified parameter, to construct a confidence set with the requirement that the confidence set is a subset of $\Theta_j$ if a parameter was declared to belong to $\Theta_j$. This includes the case of constructing compatible confidence sets for parameters of rejected hypotheses after multiple hypothesis testing.

We address the problem by proposing a single-stage procedure that constructs selective marginal confidence sets with the required property, while controlling the expected proportion of noncovering confidence sets constructed. Our method is contrasted with some limitations of a conditional approach, taken in our previous work, namely constructing confidence sets with nominal coverage conditional on selection. As a special case we consider the problem of (weak) sign classification of scalar parameters, and propose a configuration of the general procedure that nicely balances a tradeoff between power as a directional decision rule, and length of the constructed sign-determining confidence intervals. Our procedure builds on a new marginal confidence interval designed specifically for the task, and extends the directional step-up procedure of Benjamini and Hochberg.

This is joint work with Daniel Yekutieli. The talk will also cover joint work with Yoav Benjamini and Will Fithian.