Stanford University  
Department of Statistics  

DEPARTMENTAL SEMINAR  

4:15pm, Tuesday, August 4, 2015  
Sequoia Hall Room 200  

Cookies served at 3:45pm, 1st floor Lounge,  
between the two scheduled Seminars.  

Speaker:  Samuel Mueller  
School of Mathematics and Statistics,  
University of Sidney  

Title:  Interactive and data adaptive model selection with mplot  

Abstract:  
This talk focuses on the computational aspects of selection criteria that are based on either  
inclusion or exclusion frequencies. We have developed the mplot R package which provides  
a collection of functions to aid exploratory variable selection. The package contains fast  
routines to make available modified versions of the simplified adaptive fence procedure  
(Jiang et al., 2009, Annals of Statistics) as well as other graphical tools such as variable  
inclusion plots and model selection curves (Mueller and Welsh, 2010, International Statistical  
Review; Murray et al, 2013, Statistics in Medicine). A browser based graphical user inter-
face is provided to facilitate interaction with the results. These variable selection methods  
depend heavily on bootstrap resampling techniques. Fast performance for standard linear  
models is achieved using the branch and bound algorithm provided by the leaps package.  
The graphical model selection methods in mplot visualise popular model selection criteria  
that involve minimizing a penalized function of the data over a typically very large set of  
models. The penalty in the criterion function is controlled by a tuning parameter which  
determines the properties of the procedure. The implemented methods in mplot allow us  
to better explore the stability of model selection criteria through model selection curves  
and this is demonstrated through case studies.  

This is joint work with Garth Tarr (ANU) and AH Welsh (ANU).