Indiana University-Purdue University Indianapolis

Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, October 09, 2018
LD 265

Speaker: **Gang Cheng**
Department of Mathematical Sciences, IUPUI

Title: **Variable Selection via Nonconcave Penalized Likelihood and its Oracle Properties**

Abstract:

Variable selection is fundamental to high-dimensional statistical modeling, including nonparametric regression. Many approaches cannot satisfy continuous, unbiasedness and sparsity simultaneously. In 2001, Fan and Li proposed Smoothly Clipped Absolute Deviation penalty which distinguished from others in that the penalty functions are symmetric, nonconcave on $(0, \infty)$, and have singularities at the origin. It satisfies continuous, unbiasedness and sparsity simultaneously. In dealing with generalized linear model, a new algorithm is proposed for optimizing penalized likelihood functions. The proposed ideas are widely applicable. Rates of convergence of the proposed penalized likelihood estimators are established. Furthermore, with proper choice of regularization parameters, the author show that the proposed estimators perform as well as the oracle procedure in variable selection; namely, they work as well as if the correct submodel were known. Simulation shows that the newly proposed methods compare favorably with other variable selection techniques. Furthermore, the standard error formulas are tested to be accurate enough for practical applications.