

Clemson University and University of Georgia present

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JOINT STATISTICS SEMINAR – SPRING 2009

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# Ultrahigh Dimensional Variable Selection: beyond the linear model

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Friday, April 10, 4:00pm, M-102 Martin Hall

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**Abstract:** Variable selection in high-dimensional space characterizes many contemporary problems in scientific discovery and decision making. Many frequently-used techniques are based on independence screening; examples include correlation ranking or feature selection using a two-sample  $t$ -test in high-dimensional classification. Within the context of the linear model, Fan and Lv (2008) showed that this simple correlation ranking possesses a sure independence screening property under certain conditions and that its revision, called iteratively sure independent screening (ISIS), is needed when the features are marginally unrelated but jointly related to the response variable. In this paper, we extend ISIS, without explicit definition of residuals, to a general pseudo-likelihood framework, which includes generalized linear models as a special case. Even in the least-squares setting, the new method improves ISIS by allowing variable deletion in the iterative process. Our technique allows us to select important features in high-dimensional classification where the popularly used two-sample  $t$ -method fails. A new technique is introduced to reduce the false discovery rate in the feature screening stage. Several simulated and two real data examples are presented to illustrate the methodology.

**Refreshments will be served at 3:30 PM in O-112 Martin Hall.**

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**Dinner:** All are invited to a catered barbeque dinner after the talk at Bob Taylor's home on Lake Hartwell. Please notify Dr. Xiaoqian Sun prior to 5:00pm, Wednesday, April 8th, if you wish to attend (Cost \$10).

To sign up send an email to [xsun@clemsn.edu](mailto:xsun@clemsn.edu)