Statistics Seminar

Department of Mathematics and Statistics

DATE:	Thursday, March 27, 2025
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Jonathan Stallrich, North Carolina State University
TITLE:	Optimal Designs for Two-Stage Inference

Abstract

The analysis of screening experiments is often done in two stages, starting with factor selection via an analysis under a main effects model. The success of the first stage is influenced by three components: (1) main effect estimators' variances and (2) bias, and (3) the estimate of the noise variance. Component (3) has only recently been given attention with design techniques that ensure an unbiased estimate of the noise variance. In this talk, I propose a design criterion based on expected confidence intervals of the first stage analysis that naturally balances all three components. To address model misspecification, I propose a constrained design criterion that measures the inflation of common model selection criteria for underspecified models. A general computer search algorithm is presented and a direct construction method is also proposed for common screening models.

Bio

Dr. Jonathan Stallrich is an Associate Professor in the Department of Statistics at North Carolina State University. He earned his Ph.D. in Statistics from Virginia Tech in 2014. His research interests include design and analysis of screening experiments, computer experiments, online controlled experiments, functional data analysis, and variable selection. In 2021, he and his coauthors were awarded the American Statistical Association's Statistics in Physical Engineering Sciences Award for the paper, "Optimal EMG placement for a robotic prosthesis controller with sequential, adaptive functional estimation." His current interests are in identifying new screening experiments that allow for model-free estimation of error variance and developing an optimal design framework for penalized estimation.