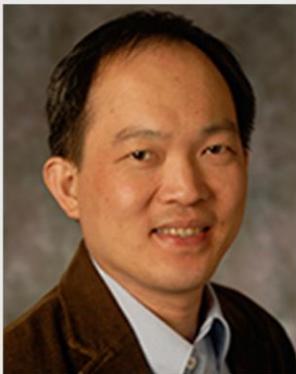


COLLOQUIUM ON THE STATISTICAL SCIENCES

THE SCHOOL OF STATISTICS

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Dr. Jimmy de la Torre

Professor, University of Hong Kong

Three-Step Estimation of Cognitive Diagnosis Models with Covariates

This research focuses on how covariates can be related to latent classifications in the context of cognitive diagnosis model (CDMs). It extends the one-step and three-step approaches from latent class analysis to the CDM framework to allow covariates to be related, not only to the latent classes, but also the attributes. Additionally, new correction weights for the three-step procedure are proposed, and they are shown to have smaller bias and root mean squared error, as well as fewer instances of likelihood separation, compared to the existing corrections. This research suggests that incorporating correction weights in the three-step approach to estimating CDMs with covariates is a viable alternative, particularly when the one-step approach is impractical.

Mr. Miguel A. Sorrel

Universidad Autónoma de Madrid

Two-Step Likelihood Ratio Test for Model Comparison in Cognitive Diagnosis Models

One procedure for item-level model comparison in cognitive diagnosis modeling is the likelihood ratio (LR) test. Although the LR test is relatively robust, its current implementation is computationally expensive given that it requires calibrating a large number of reduced models, which are then compared to the general model. In this research, we introduce the two-step LR test (2LR), which is an approximation of the LR test based on a two-step estimation procedure under the generalized deterministic inputs, noisy, "and" gate model framework. This approximation is computationally more efficient because it only requires calibrating the general model. The 2LR test is shown to have similar performance as the LR test so it can be considered a viable tool for empirical research.



18 April 2017, Tuesday
4:00 – 6:00 PM
Colloquium Room
2nd Floor, UPSS Building