



Faculty of **Education**  
The University of Hong Kong

## EDUCATIONAL AND PSYCHOLOGICAL MEASUREMENT COLLOQUIUM SERIES

# The Forward Search Algorithm for Person-Fit Analysis in Cognitive Diagnosis Models

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**June 14, 2018 (Thursday)**  
**13:00 – 14:00**

**Room 108, Runme Shaw Building, HKU**

### **Abstract**

In educational and psychological measurement, person-fit refers to the degree to which an examinee's response pattern conform a psychometric model of interest. A response pattern is said to be aberrant if it behaves differently from what it is expected based on a psychometric model. Similar to other statistical models, cognitive diagnosis models (CDMs) are not robust to the presence of aberrant response patterns. For this reason, parameter estimates can be distorted, which eventually can lead to invalid inferences. The attribute profiles extracted from CDMs are only useful for promoting learning to the extent that they are valid. To address this problem, the study proposes the use of forward search algorithm in CDMs to identify response patterns that behave differently from the majority of the data, as well as to determine their impact on the inferences generated about the fitted model. The viability of the proposed method is investigated by simulating different aberrant response patterns. To further demonstrate the performance of the algorithm, a 31-item proportional reasoning test administered in United States is analyzed. The parameter estimates with and without the flagged aberrant response patterns are compared to showcase their impact on the estimation procedure.

### **About the Speaker**

Dr. Kevin Carl Santos is a Post-Doctoral Fellow in the Faculty of Education, The University of Hong Kong. He obtained his Ph.D. and M.S. Statistics in 2018 and 2011, respectively, both from the School of Statistics, University of the Philippines-Diliman. His research interests include person fit analysis, cognitive diagnosis models, copulas, and sampling designs.

*Everyone is welcome to attend!*

*If interested, please confirm your attendance by sending an email to [kpsantos@hku.hk](mailto:kpsantos@hku.hk).*