MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Some Statistical Issues in Cognitive Diagnosis and Sequential Detection of Learning

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Refreshments 10:00 am
C405 Wells Hall

Abstract

Cognitive diagnosis models have received much attention over the last twenty years for their potential to determine the particular skills or mental traits possessed by examinees. From a statistical perspective they may be viewed as finite mixture models or restricted latent class models. Numerous models have been developed that adhere to varying theories for problem solving and address different types of assessment data. We begin by focusing on nonparametric alternatives for classification as well as the effect of model misspecification on correct classification rates, and provide an asymptotic theory for a robust procedure for diagnosis. Next the problem of learning in cognitive diagnosis is considered. A natural direction for cognitive diagnosis modeling to move towards is the study of learning and skill acquisition. Borrowing from the statistical literature on change-point detection, we propose sequential change detection procedures for identifying when learning has occurred. By quickly identifying this moment while also controlling for false detection rates, one may efficiently time the introduction of nonmastered skills with an ultimate aim of assisting a student in acquiring the entire set of skills as quickly as possible.

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