Data Science and Machine Learning Seminar Series

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Virtual Presentation: *https://purdue.webex.com/meet/aselvite*

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Multivariate Growth Curve Models and Bilinear Regression: An Overview

Multivariate Growth Curve Models (GCMs) are Generalized Analysis of Variance Models useful in the analysis of growth curves, dose-response curves as well as other curves associated with continuous variables. The model is a natural extension of the classical MANOVA model and arises when linear restrictions on the MANOVA model exists. Explicit solutions for the likelihood functions exist and the model can be extended to allow analysis of clustered longitudinal data. In this presentation, I will first provide a brief introduction and discuss residuals in the GCMs and the extended GCMs, highlighting the bilinear nature of the models. I will then discuss inference in the GCM with a focus on the mean parameter, present the trace test in the GCM we developed, which is an extension of the Lawley-Hotelling trace test of MANOVA, and provide its high-dimensional extensions. I will discuss the tests in light of interpretation of the residuals in such bilinear models. I will show simulation results and provide illustrations using real data example. If time allows, I will also briefly discuss extensions to the extended GCM.

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