Creighton University Department of Mathematics Invites You To Attend

Department of Mathematics Colloquium

Friday, April 26, 2019 | 3:30 p.m. | HLSB 522

"Tree-based Clustering of Longitudinal Data"

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Join us in HLSB 503 at 3:00 p.m. for a reception before the talk.

There is variation in adiposity growth amongst children in the United States. We seek to characterize heterogeneity in growth patterns of childhood body mass index and explore possible associations with early-life factors. There is growing literature to suggest that early-life exposure to a mixture of chemicals may increase the risk of unhealthy obesity development by disrupting hormonal processes that mediate growth, potentially explaining some variation in growth. To accommodate correlated exposures due to common sources and physical environment, we propose utilizing tree-based methods for finding children with similar growth patterns and similar exposure levels. We start by adapting the classic regression tree algorithm to define similarity in terms of growth pattern. We then illustrate how this approach allows the possible discovery of complex interactions between chemical exposures as well as non-linear associations. We then discuss how random forests could be used to determine the importance of the exposures in explaining the variation in growth.