THE UNIVERSITY OF GEORGIA
DEPARTMENT OF STATISTICS

Colloquium Series

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Thursday, October 3, 2019

3:30pm in room 202, Caldwell Building

Joint model for survival and multivariate sparse functional data with application to a study of Alzheimer's disease

Studies of Alzheimer's disease (AD) often collect multiple longitudinal clinical outcomes, which are correlated and can be predictive of AD progression. It is of great interest to investigate the association between the outcomes and time to AD onset. While joint modeling has received much attention in recent years, most works either assume parametric frameworks or focus on only a single longitudinal outcome. We model the multiple longitudinal outcomes as multivariate sparse functional data and propose a novel functional joint model. In particular, we propose a multivariate functional mixed model (MFMM) to identify the shared progression pattern and outcome-specific progression patterns of the outcomes, which enables more interpretable modeling of the association between outcomes and AD onset. The proposed method is applied to the Alzheimer's Disease Neuroimaging Initiative study (ADNI) and the functional joint model sheds new lights on inference of five longitudinal outcomes and their association with AD onset.

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