Tuesday 23 July 2024

09:00-10:30   Invited Session 4 (Main Room)

Optimal individualized treatment rules (Chairs: Giorgos Bakoyannis, Rodolphe Thiebaux)

Functional additive models for interaction effects between a treatment and functional covariates

Hyung Park (New York University, USA)

A primary goal of precision medicine is to make efficient use of data gathered at the time a patient presents for treatment, including imaging and other high-dimensional data, to select the optimal treatment for each patient. We present a functional additive regression model, uniquely constrained to represent the effect of the interaction between a categorical treatment variable and a potentially large number of pretreatment functional covariates on a response variable, while allowing the marginal effects of the covariates to remain unspecified. This method simultaneously selects functional/scalar treatment effect modifiers that exhibit possibly nonlinear interactions with the treatment indicator and that are relevant for making optimal treatment decisions. We will also consider an extension to incorporate matrix-valued pretreatment covariates in addition to functional-valued covariates. The methods will be illustrated with data from a depression clinical trial with electroencephalogram functional data as patients' pretreatment covariates.