The Chinese University of Hong Kong
Department of Statistics

Seminar

Conditional Quantile Random Forest

By

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Abstract

Decision tree is a powerful non-parametric statistical learning approach. The prevalent approach of the tree-based models is to exploit the means of an outcome to partition the sample space by assuming the outcome follows a Gaussian distribution. However, especially in clinical area, the distribution of the outcome may be skew or endures a heavy tail. Motivated by the REactions to Acute Care and Hospitalization (REACH) study, we propose a new tree-based framework based on a quantile interactive model considering profile variables as controlling variables. The tree-based approach allows us to deal with the skew clinical outcomes. By taking advantage of the controlling variables, it is also capable to do individualized treatment assignment. The proposed approach is applied to REACH study data set and Sequenced Treatment Alternatives to Relieve Depression (STAR*D) study data set. By exploiting the powerful prediction and stability of the random forest, the results show that the proposed approach leads to shorter prediction intervals and higher prediction coverage rates for REACH data set; and better treatment assignment regarding to the depression score for STAR*D data set. The results of simulation studies based on the real data confirms the consistent property and better performance of individualized treatment assignment for each patient.

Date: December 10, 2019 (Tuesday)
Time: 2:30 p.m. - 3:30 p.m.
Venue: Lady Shaw Building, Room LT6
         The Chinese University of Hong Kong

ALL INTERESTED ARE WELCOME !!