Predicting Glaucoma Progression Using Decision Trees and Random Forest

Juanjuan Fan
Professor
Department of Mathematics and Statistics
San Diego State University

Thursday, January 30, 2014
4 – 5 p.m., 6011 Bren Hall
(Bldg #314 on campus map)

Classification tree method is extended to correlated binary data and applied to the problem of developing objective prognostic classification rules in ophthalmology research. The robust z statistic from generalized estimating equation (GEE) is used as the splitting statistic to measure the between-node difference while adjusting for correlation among the fellow eyes for the same patient. The proposed method is assessed through simulations conducted under a variety of model configurations and illustrated using the perimetry and psychophysics in glaucoma (PPIG) study data. Furthermore, a random forest is constructed using longitudinally collected visual field data. In addition to producing rankings of variable importance, the random forest is also able to predict glaucoma progression with much improved sensitivity and specificity for the test sample.

For directions please refer to http://www.ics.uci.edu/about/visit/
For more information please contact Lisa Stieler at lstieler@uci.edu