

Proteomics-based biomarker discovery through data mining

Umashanger Thayasivam
Rowan University, USA

Analyzing biomarkers is a rapidly emerging study that helps answering a wide range of biological questions. Modern biology has experienced an increasing use of data mining techniques for large scale and complex biomarker analysis. There is an urgent need to identify biomarkers that can accurately detect and diagnose rare diseases. One of its greatest potentials is, the development of criteria that allow us to diagnose a disease or to classify patients according to their risk for a clinical outcome of interest. Metabolite profiling data and omics data in general, pose several statistical challenges for classification and prediction. Metabolomics, like most 'omics' technologies, suffer from the problem of having huge quantities of data without the ability to efficiently process them and gain valuable knowledge. Random Forest (RF) technique, which includes an ensemble of decision trees and incorporates feature selections and interactions naturally within the learning process, is a popular choice for omics data. Recent work in computational biology has shown an increased use of random forest, owing to its unique advantages in dealing with small sample. The focus of this presentation is two-fold. First, to provide an overview of data mining in particlulur Random Forest (RF) technique in biomarker discovery, including feature selection. Second, to briefly introduce application by presenting results from different biomarker studies.

Biography

Umashanger Thayasivam has completed his PhD from the University of Georgia in 2009. He is currently working as an Associate Professor of Statistics at Rowan University, Mathematics Department. His interdisciplinary research spans diverse areas including data mining, robust estimation and network security. He collaborated with Biomarker Discovery Center at Rowan School of Osteopathic Medicine and optimizing and verifying the utility of autoantibody biomarkers for early diagnosis. He has published several papers in reputed journals and conference proceedings. He has been PI/co-PI for several internal and external grants. He won the Best Research Paper Award for his work on robust estimation (GSTF 2017).

thayasivam@rowan.edu

Notes: