

Tuesday, October 16, 2012
12:00 - 12:50 p.m., Room T-747

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“A hierarchical model for association rule mining of sequential events: an approach to automated medical symptom prediction”

We propose a statistical modeling technique, called the Hierarchical Association Rule Model (HARM) that predicts a patient's possible future medical conditions given the patient's current and past history of reported conditions. The core of our technique is a Bayesian hierarchical model for selecting predictive association rules (such as “condition 1 and condition 2 *imply* condition 3”) from a large set of candidate rules. Because this method “borrows strength” using the conditions of many similar patients, it is able to provide predictions specialized to any given patient, even when little information about the patient's history of conditions is available. We compare the predictive performance of our method to similar tools used in computer science and machine learning using a large health record database.

Tyler McCormick is an Assistant Professor in the Department of Statistics and the Department of Sociology at the University of Washington. Tyler has a Ph.D. in Statistics from Columbia University (2011). He does both methodological and applied research in Bayesian statistics, statistical methods of high-dimensional data, and data collected using noisy or unreliable sampling designs. His scientific interests are in developing patient-level predictive models from massive healthcare data and in social network analysis, specifically developing statistical models for network-based sampling designs to reach individuals that are typically excluded from standard surveys. He is also an affiliate of the Center for the Studies of Demography and Ecology (CSDE) and the Center for Statistics and the Social Sciences (CSSS).