Data Science Seminar Series
Thursday, March 10th, 3:30-4:30 pm, S375

TITLE
A Bayesian piecewise linear model for the detection of breakpoints in housing prices

SPEAKER
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ABSTRACT
Statistical thresholds occur when the changes in the relationships between a response and predictor variables are not linear but abrupt at some points of the predictor variable values. In this paper, we defined a piecewise-linear regression model which can detect two thresholds in the relationships via changes in slopes. We developed the corresponding Bayesian methodology for model estimation and inference by proposing prior distributions, deriving posterior distributions, and generating posterior values using Metropolis and Gibbs sampling algorithm. The parameters in our model are easy to understand, highly interpretable, and flexible to make inferences. The methodology has been applied to estimate threshold effects in housing market pricing data in two cities - Kamloops and Chilliwack - in British Columbia, Canada. Our findings revealed that the implementation of changes in the government property tax policies had threshold effects in the market price trend. The proposed model will be useful to detect threshold effects in other correlated time series data as well.

BIOGRAPHY
Dr. Tomal is working as an Assistant Professor of Statistics in the Department of Mathematics and Statistics at TRU. Before joining TRU, he worked as an Assistant Professor in the Department of Computer and Mathematical Sciences at UofT Scarborough. Dr. Tomal received his PhD in Statistics from UBC, Vancouver. His research interest is in statistical machine learning, Bayesian statistical inference and statistical ecology. The main focus of his research is in developing ensemble method to improve its prediction performance by exploiting the richness of useful variables in high-dimensional data. These days, he is focusing more on developing Bayesian and computational models for ecology, health-care, housing market, and genetics data.
Dr. Rahman is an Associate Professor of Economics in the Bob Gaglardi School of Business and Economics at TRU. His diverse research interests include open economy macroeconomics, demand for money, foreign aid, community forestry, capital markets, and local government decision-making interface between elected officials and hired management – most of which is driven by his overarching interest in public policy. Dr. Rahman has served as the Chair of Department of Economics (six years), as the Interim Associate Dean of his School (two years) and on the TRU Board of Governors (six years).

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