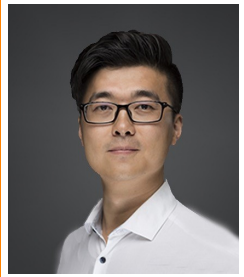**UTEP**

Mathematical Sciences
Spring 2024 Colloquium Series

Dr. Zheng Wei

Texas A& M University – Corpus Christi

Friday, April 5 at 2:00pm *(Note the unusual time)*
Bell Hall 130 and online via Zoom
Scan the QR-code for the link

Nonparametric Machine Learning for Stochastic Frontier Analysis: A Bayesian Additive Regression Tree Approach

Abstract

The stochastic frontier model is widely used in economics, finance, and management to estimate the production function and efficiency of a firm or industry. In the current literature of stochastic frontier analysis, parametric forms of production functions, such as Cobb-Douglas and translog, are often assumed a priori without validation, which may suffer from model misspecification and lead to biased estimates of efficiency. To address this issue, we propose a new set of stochastic frontier models, 1) monBART-SFM that is built upon a monotone-constrained nonparametric production function via an extension of the monotone Bayesian Additive Regression Tree (monBART) framework; 2) softBART-SFM that is built upon softBART, a smooth version of BART, which offers greater flexibility in modeling complex and nonlinear production functions that may have high dimensional inputs. We develop a Bayesian inference tool for model estimation while providing uncertainty measures. The performance of the proposed method is illustrated through simulation studies and a real data application.

Host: Dr. M. Christina Mariani (mcmariani@utep.edu)

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