Statistics Seminar

Department of Mathematics and Statistics

DATE:	Thursday, November 21, 2024
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Xinwei Deng, Virginia Tech
TITLE:	Quantity Matters, Order Matters: Statistical Learning of Data with Quantitative-Sequence Inputs

Abstract

In this talk, we would like to present several statistical learning methods for data involving a so-called quantitative-sequence (QS) inputs, a sequence of multiple components associated with their quantities. Such experiments and data are emerging in medical study, health care, logistics, and many other disciplines. To quantify the relationship between the QS inputs and response, we propose additive Gaussian process models to enable accurate prediction with appropriate uncertainty quantification. Due to the large and semi-discrete input spaces, it is non-trivial to efficiently identify optimal settings using only a small number of runs. To address this challenge, we propose the active learning approach, denote as QS-learning, to enable efficient optimization for data with QS factors. The performance of the proposed methods is elaborated by several simulation studies and a real case study in drug discovery of lymphoma treatment.

Bio

Dr. Xinwei Deng is Professor of Statistics and Data Science Faculty Fellow at Virginia Tech. He is also a co-director of VT Statistics and Artificial Intelligence Laboratory (VT-SAIL). Dr. Deng received his PhD degree from Georgia Tech in 2009. His research interests focus on statistical modeling of complex data, design and analysis of experiments, uncertainty quantification and digital twin, and the interface between experimental design and machine learning. Dr. Deng research development has produced over 120 publications in top statistics journals and machine learning conferences. He has also been associate editors for several top-tier statistical journals.