



TEXAS A&M UNIVERSITY

Statistics

The Statistics Former Student
Network (SFSN) presents

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Multivariate Statistical Process Monitoring in Complex Water and Wastewater Treatment Systems

Abstract

Annual public spending in the U.S. in the water and wastewater treatment (W/WWT) industry is nearly \$150 billion, and growing water insecurities are placing demands on W/WWT facilities to reduce costs and improve water quality. Online SCADA data from W/WWT facilities can be used to monitor both system health and water quality. In this talk, I will discuss a sampling of some of the novel W/WWT treatment systems being designed to improve water quality and quantity along with statistical issues associated with monitoring high-frequency and high-dimensional data from such systems. Non-stationarity, dependence, and non-normality are all common in W/WWT data, and the standard approaches to fault monitoring can result in excessive false positives. Furthermore, the presence of a fault should be accompanied by an indicator of which variables contribute to the fault. Faults in controlled systems often manifest as changes in covariances, and many W/WWT systems produce functions that require monitoring.

Biography

Amanda Hering is a Professor in the Department of Statistical Science at Baylor University. She obtained her PhD in 2009 in Statistics from Texas A&M University under the advisement of Marc Genton. She spent the next seven years as an Assistant and then Associate Professor at Colorado School of Mines before joining Baylor. She has over 60 peer-reviewed papers in both statistics and subject matter journals. Her current research focus is on developing methods to solve problems in natural and engineered water environments using data. She uses statistical methods such as time series, functional data analysis, multivariate analysis, and modeling. She is an Associate Editor for the journals Environmetrics, Technometrics, and Data Science in Science. She has been selected for early investigator awards from both The International Environmetrics Society and the American Statistical Association's Section on Statistics in the Environment. She has received over \$3 million to support her work through organizations such as the National Science Foundation and the Department of Energy.

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