samsi
NSF·Duke·NCSU·UNC

Joint MUMS Program Transition - SPUQ Workshop
May 14-17, 2019
SPEAKER/ABSTRACT

Ying Hung, Rutgers University

"Computer Experiments with Binary Time Series and Applications to Cell Biology: modeling, estimation and calibration"

Abstract:
Computer experiments have become ubiquitous in various applications from rocket injector designs to weather forecast. Although extensive research has been devoted in the literature, computer experiments with binary time-series outputs have received scant attention. Motivated by the analysis of a class of cell adhesion experiments, we introduce a new emulator as well as a new calibration framework for binary time-series outputs. More importantly, we provide their theoretical properties to ensure the estimation performance in an asymptotic setting. The application to the cell adhesion experiments illustrates that the proposed emulator and calibration framework not only provide an efficient alternative for the computer simulation, but also reveal important insight on the underlying adhesion mechanism, which cannot be directly observed through existing methods.