Statistical Sciences
UNIVERSITY OF TORONTO

# SEMINAR

October 1, 2015 at 3:30pm

**Refreshments at 3:10pm*

Sidney Smith Hall, Room 1087

Speaker: Raymond Wong, Iowa State University

Host: Fang Yao

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## A Frequentist Approach to Computer Model Calibration

We consider the computer model calibration problem and provide a general frequentist approach with uncertainty quantification. Under the proposed framework, the data model is semi-parametric with a nonparametric discrepancy function which accounts for any discrepancy between the physical reality and the simulator. In an attempt to solve the fundamentally important (but often ignored) identifiability issue between the computer model parameters and the discrepancy function, we propose a new and identifiable parametrization of the calibration problem. We also develop a two-step procedure for estimating all the relevant quantities under the new parameterization. This estimation procedure is shown to enjoy excellent rates of convergence and can be straightforwardly implemented with existing software. For uncertainty quantification, bootstrapping is adopted to construct confidence regions for the quantities of interest. The practical performance of the proposed methodology is illustrated through simulation examples and an application to a computational fluid dynamics model.