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SPEAKER/ABSTRACT

David Woods, University of Southampton

“Design of Experiments for the Calibration of Computational Models”

Abstract:

Computational modelling now underpins much research in the sciences and engineering, allowing in silico investigations and predictions of complex systems. Reliable and accurate computational modelling often relies on the calibration of the model using physical data, usually collected via designed experiments. These data are used to tune, or estimate, unknown model parameters and, perhaps, to learn the discrepancy between the computational model and reality.

In this talk, we present some new methods for the optimal design of physical experiments for this calibration problem. A Bayesian approach is adopted, with a Gaussian process prior assumed for the output from the computational model. New decision-theoretic optimal designs are sought for this problem, using novel methods for the numerical approximation of the expected utility of a design. The results are motivated by, and demonstrated on, problems from science and technology.

Authors: David Woods, Yiolanda Englezou (University of Southampton, UK) Tim Waite (University of Manchester, UK)