University of Southern California

DANIEL J. EPSTEIN DEPARTMENT OF
INDUSTRIAL AND SYSTEMS ENGINEERING

EPSTEIN INSTITUTE SEMINAR • ISE 651 SEMINAR

Computer Experiments with Time-Varying Inputs: Gaussian Surrogates and Experimental Designs

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ABSTRACT

Computer models of dynamic systems are characterized by time-varying inputs and outputs. Time series outputs can often be reduced for analysis via principal components because output functions often take one of a few “characteristic shapes” for any input configuration, e.g. Higdon et al. (2008). But the relevant set of input functions is not so simple in many applications, and effective dimension reduction for inputs may not be possible. In this talk, a Gaussian process surrogate is developed for this case, and demonstrated with a computer model of the response of marrow stem cells to ionizing radiation. An extension of the maximin distance design criterion is given, and experimental designs constructed with this criterion are presented.

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BIO

Ph.D. Statistics, Virginia Polytechnic Institute and State University (1977)
M.S. Statistics, Virginia Polytechnic Institute and State University (1975)
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Dr. Morris's research is primarily focused on problems of experimental design, especially for studies involving computational models. Recent applications involve experimental design for response surface problems characterized by known symmetries among experimental factors, and experiments for evaluating and validating matching processes used in forensic science. The design and analysis of computer experiments (DACE), involves the planning/selection of "runs" of a large computer model and subsequent examination of the resulting output to validate, calibrate, or develop relatively fast-running approximations of the model.