

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

Workflows for Quantifying Uncertainty in Computational Model Predictions



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Room W122, Engineering Building 2

LECTURE ABSTRACT

Over the last decade, improved measurement capabilities and computational resources have led to significant algorithmic developments toward efficient uncertainty quantification (UQ) for computational models. Such models of physical systems often involve input parameters and boundary conditions that exhibit certain degree of uncertainty. Estimation and propagation of these uncertainties are crucial for model validation, computational/experimental design and decision making. This talk will highlight algorithm components used both for forward propagation of uncertainties and for inverse problems, such as parameter estimation via Bayesian inference. I will list associated major challenges, including the curse of dimensionality and model structural error estimation, in the context of computationally expensive models of physical systems. Both fundamental and more recent methods will be introduced and demonstrated, impacting a wide range of applications, such as climate modeling, atmospheric transport models, and estimation of material properties.

SPEAKER BIOSKETCH

Cosmin Safta did his Bachelors and Masters in Aerospace Engineering at the Polytechnic University of Bucharest, Romania. He received his Ph.D. in Mechanical Engineering from the University of Buffalo in 2001. He has been a Principal Member of Technical Staff at Sandia National Laboratories since 2016.

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