

Cooperative Research in Multi-Formalism, Multi-Solution Modeling: Opportunities and Challenges

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Abstract

Practical performance, dependability, and performability evaluations of complex systems are often done using multiple modeling formalisms, and can require multiple model solution methods. Typical academic modeling tools are usually limited to a single modeling formalism or a single or small number of solution methods, due the large effort required to build a practical multi-formalism, multi-solution modeling framework. Faster research progress and more practical tools could be created if a modeling framework existed that allowed researchers from different research groups to implement only their research results, thus leveraging work done by others, avoiding the need to re-implement functionality that is not their research interest but is needed to build a fully operational tool. In this talk, I will present our group's experience with the Mobius multi-formalism, multi-solution modeling framework, emphasizing our experience to date in working with other research groups to create a variety of modeling formalisms and model solution methods. In doing so, I will present the theoretical foundation for the Mobius framework that makes this cooperation possible, and the technical and non-technical opportunities and challenges that result when multiple research groups work together. I hope that this presentation will illustrate the potential of this type of collaboration, and motivate others to develop research cooperations.

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² This material is based upon work supported by the National Science Foundation under Grant Nos. CCR-00-86096 and INT-0233490. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.