

"The Grandest Challenge in Distributed Simulation."

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There are many significant challenges facing the distributed simulation community. Among them are: modeling human and organizational behavior, maintaining consistency in multi-resolution models, establishing a framework for plug-and-play (interoperability), maintaining consistency in component replications, guaranteeing causality and causal message delivery, ensuring repeatability and reversibility, establishing broadly applicable, efficient publication, subscription and distributed data management algorithms, and guaranteeing real time processing rates. These are all worthy of intense pursuit and exploration. But none of them is the grandest challenge. The grandest challenge for the distributed simulation community is building simulations today so that they will be capable of producing meaningful results for future, currently unknown, users. We call this challenge the "technical aspects of expectations management."

Simulations, more than any other computing application, are used to predict events. Users infer meaning and ascribe predictive powers well beyond anything reasonable, especially considering how simulations are often designed and implemented. This overextended trust is compounded by the fact that the distributed simulation community places an emphasis on reuse, meaning any exaggerated placement of meaning on component simulations becomes magnified when the simulations are used to construct larger, distributed simulations. The challenge is to identify methods for requirements analysis, construction of federations of models and quality assurance that ensure a match between user expectations and actual outcome.

We explore the details of the technical aspects of expectations management. We discuss the design of instruments that may allow users to observe the behavior of component simulations, as well as federated distributed simulations, in a meaningful way. We discuss methods that might be employed to capture user expectations and map them to derived, distributed simulations. Finally, we suggest avenues of research that will lead to proper management of distributed simulation user expectations.