

WHY SHOULD WE DEVELOP SIMULATION MODELS IN PAIRS?

Bernard P. Zeigler

University of Arizona
Department of Electrical and Computer Engineering
College of Engineering
1230 E. Speedway Blvd.
Tucson, AZ. 85721-0104

ABSTRACT

The conventional approach to model construction for simulation is to focus on a single model and follow a more or less structured development cycle. Why we put in twice the time and effort to develop two models rather than one? The answer lies in the fact that like most greedy heuristics, short-sightedness at the beginning may be much more costly in the end. This talk will champion the cause of the pairs-of-models (perhaps families of models) with discussion of multiresolution modeling. We show how the pair-of-models approach leads to be better results overall than construction of a complex model followed by a simpler model developed subsequently by necessity under stress when complexity overwhelms. Benefits include the ability to perform mutual cross-calibration, avoiding the usual difficulties in harmonization of the underlying ontologies as well as ability to better reconcile and correlate predictions of referent system outcomes.

AUTHOR BIOGRAPHY

BERNARD P. ZEIGLER is Chief Scientist at RTSync Corp., Professor Emeritus of Electrical and Computer Engineering at the University of Arizona (UA) and Affiliated Research Professor in the C4I Center at George Mason University. He is internationally known for his seminal contributions in modeling and simulation theory. He has published several highly cited books including “Theory of Modeling and Simulation” (3rd edition in process) and “Guide to Modeling and Simulation of Systems of Systems.” He is the originator of the Discrete Event System Specification (DEVS) formalism in 1976 which has spurred the development of a world-wide research community, with its own conference meetings, and research/technology awards. In 1995, Zeigler was named Fellow of the IEEE in recognition of his contributions to the theory of discrete event simulation. Dr. Zeigler co-founded the Arizona Center for Integrative Modeling and Simulation (ACIMS) in 2001 dedicated to the development of modeling and simulation as a discipline of the future. Dr. Zeigler has been the lead architect of multiple web-based systems in complex systems that incorporate unique behaviors derived from DEVS-based properties. He is also Fellow of the Society for Modeling and Simulation International and member of its Hall of Fame. He received the Life-time Achievement Award from INFORMS in 2016. His email address is zeigler@ece.arizona.edu.