Modeling and Simulation Support for System of Systems Engineering Applications

Description: ...a much-needed handbook with contributions from well-chosen practitioners. A primary accomplishment is to provide guidance for those involved in modeling and simulation in support of Systems of Systems development, more particularly guidance that draws on well-conceived academic research to define concepts and terms, that identifies primary challenges for developers, and that suggests fruitful approaches grounded in theory and successful examples.

Paul Davis, The RAND Corporation

Modeling and Simulation Support for System of Systems Engineering Applications provides a comprehensive overview of the underlying theory, methods, and solutions in modeling and simulation support for system of systems engineering. Highlighting plentiful multidisciplinary applications of modeling and simulation, the book uniquely addresses the criteria and challenges found within the field.

Beginning with a foundation of concepts, terms, and categories, a theoretical and generalized approach to system of systems engineering is introduced, and real-world applications via case studies and examples are presented. A unified approach is maintained in an effort to understand the complexity of a single system as well as the context among other proximate systems. In addition, the book features:

- Cutting edge coverage of modeling and simulation within the field of system of systems, including transportation, system health management, space mission analysis, systems engineering methodology, and energy
- State-of-the-art advances within multiple domains to instantiate theoretic insights, applicable methods, and lessons learned from real-world applications of modeling and simulation
- The challenges of system of systems engineering using a systematic and holistic approach
- Key concepts, terms, and activities to provide a comprehensive, unified, and concise representation of the field
- A collection of chapters written by over 40 recognized international experts from academia, government, and industry
- A research agenda derived from the contribution of experts that guides scholars and researchers towards open questions

Modeling and Simulation Support for System of Systems Engineering Applications is an ideal reference and resource for academics and practitioners in operations research, engineering, statistics, mathematics, modeling and simulation, and computer science. The book is also an excellent course book for graduate and PhD-level courses in modeling and simulation, engineering, and computer science.

Larry B. Rainey, PhD, is Founder and Senior Partner at Integrity Systems and Solutions, LLC, a consulting firm that specializes in modeling and simulation within missile defense and space operations domains. With more than 20 years of systems engineering experience, Dr. Rainey has also worked for the Missile Defense Agency and other U.S. Department of Defense organizations that address system of systems challenges. He has also been a visiting assistant professor of systems engineering at the Air Force Institute of Technology at Wright–Patterson Air Force Base Ohio and an assistant professor of systems engineering at the Colorado Technical University in Colorado Springs, Colorado.

Andreas Tolk, PhD, is Chief Scientist of SimIS Inc., which provides modeling and simulation services, enterprise architecture knowledge, and integration solutions to its customers. Dr. Tolk is also Adjunct Professor in the Department of Engineering Management and Systems Engineering at Old Dominion University, as well as the author of Engineering Principles of Combat Modeling and Distributed Simulation, which is published by Wiley.

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