Description

Explore the military and combat applications of modeling and simulation

Engineering Principles of Combat Modeling and Distributed Simulation is the first book of its kind to address the three perspectives that simulation engineers must master for successful military and defense related modeling: the operational view (what needs to be modeled); the conceptual view (how to do combat modeling); and the technical view (how to conduct distributed simulation). Through methods from the fields of operations research, computer science, and engineering, readers are guided through the history, current training practices, and modern methodology related to combat modeling and distributed simulation systems. Comprised of contributions from leading international researchers and practitioners, this book provides a comprehensive overview of the engineering principles and state-of-the-art methods needed to address the many facets of combat modeling and distributed simulation and features the following four sections:

- **Foundations** introduces relevant topics and recommended practices, providing the needed basis for understanding the challenges associated with combat modeling and distributed simulation.

- **Combat Modeling** focuses on the challenges in human, social, cultural, and behavioral modeling such as the core processes of "move, shoot, look, and communicate" within a synthetic environment and also equips readers with the knowledge to fully understand the related concepts and limitations.
Distributed Simulation introduces the main challenges of advanced distributed simulation, outlines the basics of validation and verification, and exhibits how these systems can support the operational environment of the warfighter.

Advanced Topics highlights new and developing special topic areas, including mathematical applications for combat modeling; combat modeling with high-level architecture and base object models; and virtual and interactive digital worlds.

Featuring practical examples and applications relevant to industrial and government audiences, Engineering Principles of Combat Modeling and Distributed Simulation is an excellent resource for researchers and practitioners in the fields of operations research, military modeling, simulation, and computer science. Extensively classroom tested, the book is also ideal for courses on modeling and simulation; systems engineering; and combat modeling at the graduate level.

ABOUT THE AUTHOR

ANDREAS TOLK, PhD, is Professor in the Department of Engineering Management and Systems Engineering at Old Dominion University. He supported the development of the discipline of modeling and simulation with his publications for a variety of modeling and simulation conferences as well as his contributions to various NATO research activities in the domains of combat modeling, command and control, and studies and analysis.

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