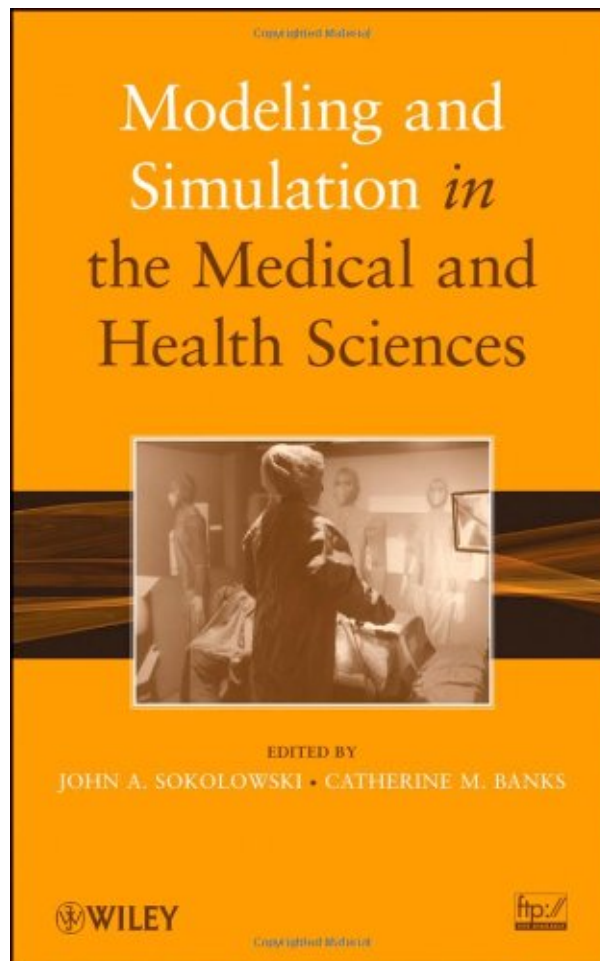


# MODELING AND SIMULATION IN THE MEDICAL AND HEALTH SCIENCES FROM WILEY



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EDITED BY

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From the Back Cover

Promotes collaboration between medical modeling and simulation developers and users

Modeling and simulation provide practitioners in the medical and health sciences the capability to better understand the fundamental aspects of healthcare, such as human behavior, human systems, medical treatment, and medical education. Using mathematical models and computer simulations to explore various applications, Modeling and Simulation in the Medical and Health Sciences encourages developers and users to share expertise, requirements, and criticisms while recognizing limitations and expectations regarding model development and simulation design.

Providing a theoretical foundation while also illustrating modern examples, the book features three parts:

- **Fundamentals of Medical and Health Sciences Modeling and Simulation** introduces the concepts and terminology that serve as a foundation for the subsequent topics of discussion and describes three distinct modes of modeling and simulation: live, where people employ real equipment for training purposes; constructive, where simulated people and equipment augment real-world conditions for training or experimentation; and virtual, where people employ simulated equipment to improve physical skills and decision-making ability
- **Medical and Health Sciences Models** details the link between two models: computational models as they are associated with the constructive mode, and physical models as they are used from a virtual mode perspective
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This edited book is divided into three parts: Fundamentals of Medical and Health Sciences Modeling and Simulation introduces modeling and simulation in the medical and health sciences; Medical and Health Sciences Models provides the theoretical underpinnings of medical and health sciences modeling; and Modeling and Simulation Applications in Medical and Health Sciences focuses on teaching, training, and research applications. The book begins with a general discussion of modeling and simulation from the modeling and simulation discipline perspective. This discussion grounds the reader in common terminology. It also relates this terminology to concepts found in the medical and health care (MHC) area to help bridge the gap between developers and MHC practitioners. Three distinct modes of modeling and simulation are described: live, constructive, and virtual. The live approach explains the concept of using real (live) people employing real equipment for training purposes. The constructive mode is a means of engaging medical modeling and simulation. In constructive simulation, simulated people and simulated equipment are developed to augment real-world conditions for training or experimentation purposes. The virtual mode is perhaps the most fascinating as virtual operating rooms and synthetic training environments are being produced for practitioners and educators at break-neck speed. In this mode, real people are employing simulated equipment to improve physical skills and decision-making ability.

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