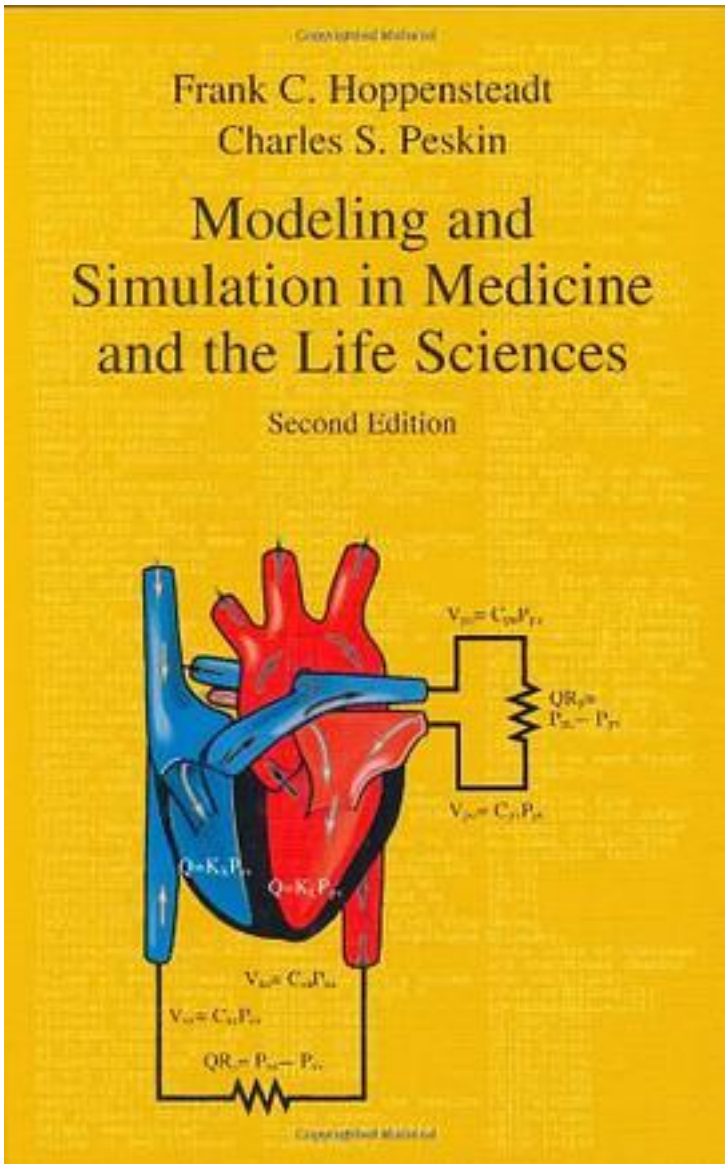
Modeling and Simulation in Medicine and the Life Sciences



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The result of lectures given by the authors at New York University, the University of Utah, and Michigan State University, the material is written for students who have had only one term of calculus, but it contains material that can be used in modeling courses in applied mathematics at all levels through early graduate courses. Numerous exercises are given as well as solutions to selected exercises, so as to lead readers to discover interesting extensions of that material. Throughout, illustrations depict physiological processes, population biology phenomena, corresponding models, and the results of computer simulations. Topics covered range from population phenomena to demographics, genetics, epidemics and dispersal; in physiological processes, including the circulation, gas exchange in the lungs, control of cell volume, the renal counter-current multiplier mechanism, and muscle mechanics; to mechanisms of neural control. Each chapter is graded in difficulty, so a reading of the first parts of each provides an elementary introduction to the processes and their models.

作者介绍:

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