



Simio and Simulation: Modeling, Analysis, Applications: Economy

By Dr. W. David Kelton, Dr. Jeffrey S. Smith, David T. Sturrock

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This economy version substitutes grayscale interior graphics to keep costs low for students.

Content:

This textbook explains how to use simulation to make better business decisions in application domains from healthcare to mining, heavy manufacturing to supply chains, and everything in between. It is written to help both technical and non-technical users better understand the concepts and usefulness of simulation. It can be used in a classroom environment or in support of independent study. Modern software makes simulation more useful and accessible than ever and this book illustrates simulation concepts with Simio, a leader in simulation software.

Author Statement:

This book can serve as the primary text in first and second courses in simulation at both the undergraduate and beginning-graduate levels. It is written in an accessible tutorial-style writing approach centered on specific examples rather than general concepts, and covers a variety of applications including an international flavor. Our experience has shown that these characteristics make the text easier to read and absorb, as well as appealing to students from many different cultural and applications backgrounds.

A first simulation course would probably cover Chapter 1 through 8 thoroughly, and likely Chapters 9 and 10, particularly for upper class or graduate level students. For a second simulation course, it might work to skip or quickly review Chapters 1-3 and 6, thoroughly cover all other chapters up to Chapter 10, and use

Chapter 11 as reinforcing assignments.

The text or components of it could also support a simulation module of a few weeks within a larger survey course in programs without a stand-alone simulation course (e.g., MBA). For a simulation module that's part of a larger survey course, we recommend concentrating on Chapters 1, 4, and 5, and then perhaps lightly touch on Chapters 7 and 8.

The extensibility introduced in Chapter 10 could provide some interesting project work for a graduate student with some programming background, as it could be easily linked to other research topics. Likewise Appendix A could be used as the lead-in to some advanced study or research in the latest techniques in simulation-based planning and scheduling.

Supplemental course material is also available on-line.

Third Edition:

The new third edition adds sections on Randomness in Simulation, Model Debugging, and Monte Carlo simulation. In addition, the coverage of animation, input analysis and output analysis has been significantly expanded. There is a new appendix on simulation-based scheduling, end-of-chapter problems have been improved and expanded, and we have incorporated many reader suggestions. We have reorganized the material for improved flow, and have updates throughout the book for many of the new Simio features recently added. A new format better supports our e-book users, and a new publisher supports significant cost reduction for our readers.

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Editorial Review

About the Author

W. David Kelton is a Professor in the Department of Operations and Business Analytics at the University of Cincinnati, where he also serves as Director of the MS Program in Quantitative Analysis. He received a BA in mathematics from the University of Wisconsin-Madison, an MS in mathematics from Ohio University, and MS and PhD degrees in industrial engineering from Wisconsin. He was formerly on the faculty at Penn State, the University of Minnesota, The University of Michigan, and Kent State. Visiting posts have included the Naval Postgraduate School, the University of Wisconsin-Madison, the Institute for Advanced Studies in Vienna, and the Warsaw School of Economics. He is a Fellow of both INFORMS and IIE.

Jeffrey S. Smith is the Joe W. Forehand Professor of Industrial and Systems Engineering at Auburn University and a founding partner of Conflexion, LLC. Prior to his position at Auburn, he was an Associate Professor of Industrial Engineering at Texas A&M University. In addition to his academic positions, Dr. Smith has held professional engineering positions with Electronic Data Systems (EDS) and Philip Morris USA. Dr. Smith has a BS in Industrial Engineering from Auburn University and MS and PhD degrees in Industrial Engineering from The Pennsylvania State University. His primary research interests are in manufacturing systems design and analysis, and discrete-event simulation.

David T. Sturrock is Member and Vice-President of Operations for Simio LLC. He is responsible for development, support, and services for Simio LLC simulation and scheduling products. In that role he not only manages new product development, but also teaches frequent commercial courses and manages a variety of consulting projects. He also teaches simulation classes as a Field Faculty member at the University of Pittsburgh. With over 30 years of experience, he has applied simulation techniques in the areas of manufacturing, transportation systems, scheduling, high-speed processing, plant layout, business processes, call centers, capacity analysis, process design, health care, plant commissioning, and real-time control. He received his bachelor's degree in industrial engineering from The Pennsylvania State University with concentrations in manufacturing and automation.

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