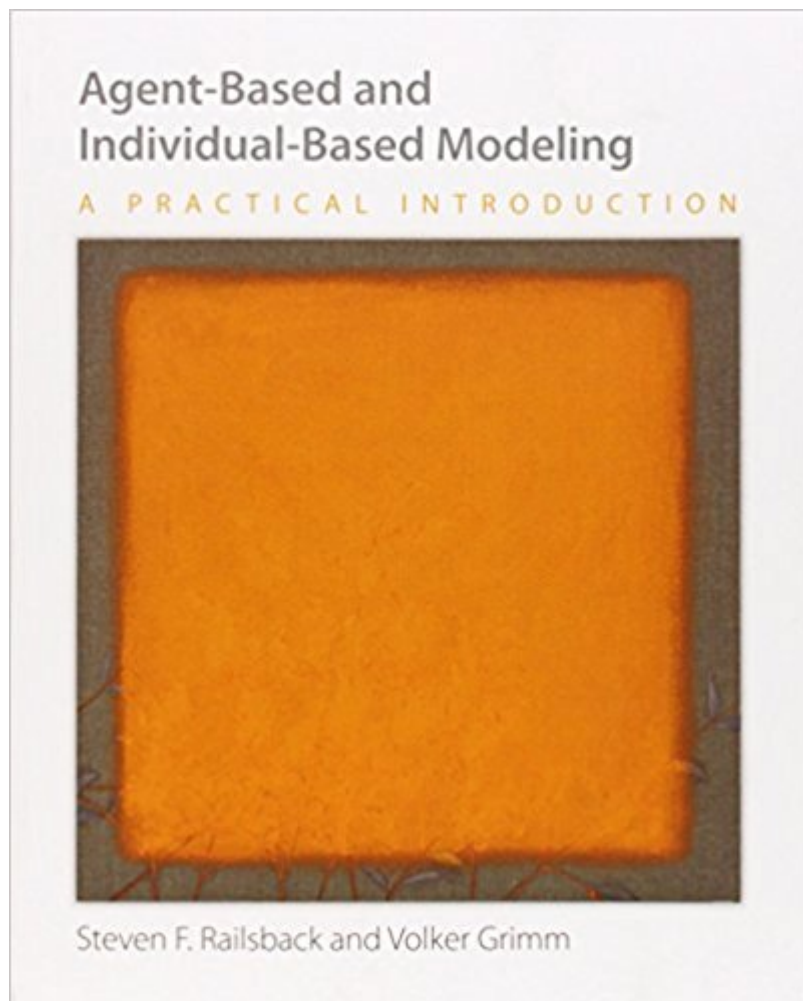The book was found

Agent-Based And Individual-Based Modeling: A Practical Introduction

Synopsis

Agent-based modeling is a new technique for understanding how the dynamics of biological, social, and other complex systems arise from the characteristics and behaviors of the agents making up these systems. This innovative textbook gives students and scientists the skills to design, implement, and analyze agent-based models. It starts with the fundamentals of modeling and provides an introduction to NetLogo, an easy-to-use, free, and powerful software platform. Nine chapters then each introduce an important modeling concept and show how to implement it using NetLogo. The book goes on to present strategies for finding the right level of model complexity and developing theory for agent behavior, and for analyzing and learning from models. Agent-Based and Individual-Based Modeling features concise and accessible text, numerous examples, and exercises using small but scientific models. The emphasis throughout is on analysis--such as software testing, theory development, robustness analysis, and understanding full models--and on design issues like optimizing model structure and finding good parameter values. The first hands-on introduction to agent-based modeling, from conceptual design to computer implementation to parameterization and analysisProvides an introduction to NetLogo with nine chapters introducing an important modeling concept and showing how to implement it using NetLogoFilled with examples and exercises, with updates and supplementary materials at http://www.railsback-grimm-abm-book.com/Designed for students and researchers across the biological and social sciencesWritten by leading practitionersLeading universities that have adopted this book include: Amherst College Brigham Young University Carnegie Mellon UniversityCornell University Miami University Northwestern University Old Dominion University Portland State University Rhodes College Susquehanna University University College, Dublin University of ArizonaUniversity of British ColumbiaUniversity of Michigan University of South FloridaUniversity of Texas at Austin University of Virginia

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Customer Reviews

"Biologists . . . have been relatively slow to take advantage of enhanced computing power and unlock the potential of these techniques. This book removes any excuse. Based on a course run by the authors, who both come from an ecological background, and building on an earlier, more conceptual book, this aims to provide the necessary tools to students and researchers."--Frontiers of Biogeography"This volume would be an excellent text for an introductory course in modeling as science, or for self-study by a mature researcher interested in learning about this important new way of doing science."--H. Van Dyke Parunak, JASSS"This book represents something I have been waiting for some years now: a good and solid introduction to the field of individual- and agent-based models (hereafter IBM/ABM's). This book fulfills my needs, using a mix of theory and practical examples which seems to suit the topic well. . . . [T]he book is not only a practical guide but also serves as a good introduction to the basics of 'healthy' programming. These authors are the right ones to do this as they have a strong background in the philosophical aspects as well as the practical issues of modeling."--Basic and Applied Ecology"Railsback and Grimm have done the heavy lifting required to establish a solid IBM course by providing a carefully crafted inquiry-based curriculum. This accomplishment removes a major impediment to the proliferation of IBM courses. Although the book seems aimed at a graduate-level course, I also do not see why an ambitious teacher with motivated students could not use this textbook as the basis of an upper-level undergraduate course in individual based modeling. Agent-based and individual-based modeling has the potential to foster an appreciation of the value and place of individual-based models in our field in the next generation of emerging ecologists (who already have computational leanings)."--Christopher X. Jon Jensen, Ecology

"Knitting together ecology, economics, and social systems, this wonderful book will encourage and enlighten novices and experienced modelers alike. It highlights the importance of patterns at every level of the modeling process, the need for clear explication of assumptions, and the benefits of models composed of discrete entities (agents) which interact, evolve, and mimic reality."--Louis

Gross, University of Tennessee, Knoxville"Railsback and Grimm provide a needed book on how to develop, code, and analyze agent-based models. They so expertly explain the art and science of modeling that even the most modeling-shy beginner will master the skills. Readers will also gain a deep understanding of the increasing importance of agent-based models for interpreting the patterns of nature and human society."--Donald L. DeAngelis, U.S. Geological Survey"Railsback and Grimm have written a superb introduction to agent-based models. They combine hands-on programming exercises, introductions to some of the core concepts in complex systems, and instruction in model design and analysis. The result is an excellent book that's ideal for both undergraduates and academics."--Scott E. Page, author of Diversity and Complexity "This exceptional book offers a systematic introduction to the scientific use of agent-based modeling, including the implementation, testing, and validation of models. Until now there was no good textbook available to teach students the theory and practice of agent-based modeling. Railsback and Grimm provide such a text, one that will likely become a classic in the field."--Marco A. Janssen, Arizona State University"This book is an invaluable guide to agent-based modeling. A significant contribution to the field, it will train the next generation of modelers and teach best practices to existing modelers. Railsback and Grimm have in-depth expertise and experience in developing and teaching agent-based modeling, and are well qualified to write such a book."--Richard Stillman, Bournemouth University

This is a very well written introduction to agent-based modeling. The authors are luminaries in the field and this book provides a very useful, clear, and effective introduction to practical modeling. The choice of Netlogo as the programming language is very wise, as it lets the reader quickly get to work writing models without getting bogged down in programming details. This book is suitable for a text in a formal course, or as a self-study guide. The emphasis on ODD (Overview, Design, Details) approach to designing and documenting models is very helpful and there are good examples throughout of using the ODD description to replicate models used in published research.I recommend this book both as a textbook for teaching agent-based modeling and as a reference book for anyone working in the field.

Very good introduction to both agent based modeling and the NetLogo software. A good text for a modeling course. Good accompanying on-line resources. My only complaint is that the book is a little uneven, chapter to chapter, in the level of detail and instruction. Those using this book to teach themselves may get frustrated, as the authors 'take the training wheels off' very quickly. Some basic

things seem under-explained, while others are over-explained. I do like that the book isn't a step by step 'push this button' cookbook (like most computer books), but arguably there's a bit too much philosophy of modeling material at times. People with no or little programming experience may get unnecessarily bogged down stymied by simple problems that a teacher or classmate could quickly answer. The strength of the examples and exercises is that they very quickly get the reader to think critically about modeling and its assumptions; the weakness of the more philosophical approach is it will turn off people who are more interested in quickly learning the software. This is NOT a NetLogo instruction manual. While those with some programming experience and/or a fair bit of patience and tenacity can use this book to teach themselves how to program ABMs, the best use of this book is probably as a textbook in a modeling course.

I really appreciated that the book focuses on the high level concepts and planning, rather than details such as syntax which you can get from other resources. There are many notes to people with programming experience to relate their knowledge to NetLogo and help prevent frustration. I wish other books about software realized how important understanding the goals and concepts are as opposed to details which you can slot into place once you have a better understanding of the big picture.

Excellent resource for self study. My schedule doesn't lend itself to a regular class schedule (assuming I could even find a class on this) so having a book like this has been extremely helpful in learning ABM and Netlogo on my own. The authors really did a nice job of guiding the reader progressively thru the concepts and methods.

This book has become the go-to source to students and researchers looking to learn agent-based modeling. I meet students from anthropology, economics, and the biological sciences who state that the clear, structured approach in this book is far and away the best way for individuals to pursue self-study. As well, it works well in the classroom.

Great book, clear explanations and designed to put new skills in practice, inmediatelly.

Good intro to NetLogo. There is a healthy focus on getting data that is testable and doing "work" as opposed to random exploration.Left me hungry for more.

As expected. Thanks. Maybe the size of letters should be a little bigger...

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