
Discrete Event Simulation A First Course

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Discrete-event System Simulation

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Simulation A
First Course* **Downloaded
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JAMARI TOMMY

*Discrete Event Simulation
for Health Technology*

Assessment Springer

Science & Business Media

This unique textbook

comprehensively

introduces the field of

discrete event systems,

offering a breadth of

coverage that makes the

material accessible to

readers of varied

backgrounds. The book

emphasizes a unified

modeling framework that

transcends specific

application areas, linking

the following topics in a

coherent manner:

language and automata

theory, supervisory

control, Petri net theory,

Markov chains and

queueing theory, discrete-

event simulation, and

concurrent estimation

techniques. Topics and

features: detailed

treatment of automata

and language theory in

the context of discrete

event systems, including

application to state

estimation and diagnosis

comprehensive coverage

of centralized and

decentralized supervisory

control of partially-

observed systems timed
models, including timed
automata and hybrid
automata stochastic
models for discrete event
systems and controlled
Markov chains discrete
event simulation an
introduction to stochastic
hybrid systems sensitivity
analysis and optimization
of discrete event and
hybrid systems new in the
third edition: opacity
properties, enhanced
coverage of supervisory
control, overview of latest
software tools This proven
textbook is essential to
advanced-level students
and researchers in a
variety of disciplines
where the study of
discrete event systems is
relevant: control,
communications,
computer engineering,
computer science,
manufacturing
engineering,
transportation networks,
operations research, and
industrial engineering.
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Ann Arbor.

[Discrete Event Modeling
and Simulation](#)

[Technologies](#) John Wiley &
Sons

Complex artificial dynamic
systems require advanced
modeling techniques that
can accommodate their
asynchronous, concurrent,
and highly non-linear
nature. Discrete Event
systems Specification
(DEVS) provides a formal
framework for hierarchical
construction of discrete-
event models in a
modular manner, allowing
for model re-use and
reduced development
time. Discrete Event
Modeling and Simulation
presents a practical
approach focused on the
creation of discrete-event
applications. The book
introduces the CD++ tool,
an open-source
framework that enables
the simulation of discrete-
event models. After
setting up the basic
theory of DEVS and Cell-
DEVS, the author focuses
on how to use the CD++
tool to define a variety of
models in biology,
physics, chemistry, and
artificial systems. They
also demonstrate how to
map different modeling

techniques, such as Finite State Machines and VHDL, to DEVS. The in-depth coverage elaborates on the creation of simulation software for DEVS models and the 3D visualization environments associated with these tools. A much-needed practical approach to creating discrete-event applications, this book offers world-class instruction on the field's most useful modeling tools.

Concurrent and Comparative Discrete Event Simulation

Academic Press
Discrete event simulation provides a powerful mechanism for designing and testing new extreme-scale programming models for high-performance computing. Rather than debug, run, and wait for results on an actual system, design can first iterate through a simulator. This is particularly useful when test beds cannot be used, i.e. to explore hardware or scales that do not yet exist or are inaccessible. Here we detail the macroscale components of the structural simulation toolkit (SST). Instead of depending on trace replay or state machines, the simulator is architected to execute

real code on real software stacks. Our particular user-space threading framework allows massive scales to be simulated even on small clusters. The link between the discrete event core and the threading framework allows interesting performance metrics like call graphs to be collected from a simulated run. Performance analysis via simulation can thus become an important phase in extreme-scale programming model and runtime system design via the SST macroscale components.

DEMOS A System for Discrete Event Modelling on Simula

Springer Science & Business Media
For junior- and senior-level simulation courses in engineering, business, or computer science. While most books on simulation focus on particular software tools, Discrete Event System Simulation examines the principles of modeling and analysis that translate to all such tools. This language-independent text explains the basic aspects of the technology, including the proper collection and analysis of data, the use of analytic techniques, verification and validation of models, and designing

simulation experiments. It offers an up-to-date treatment of simulation of manufacturing and material handling systems, computer systems, and computer networks. Students and instructors will find a variety of resources at the associated website, www.bcnn.net/, including simulation source code for download, additional exercises and solutions, web links and errata.

Handbook of Simulation Pearson Education

"This is an excellent and well-written text on discrete event simulation with a focus on applications in Operations Research. There is substantial attention to programming, output analysis, pseudo-random number generation and modelling and these sections are quite thorough. Methods are provided for generating pseudo-random numbers (including combining such streams) and for generating random numbers from most standard statistical distributions." --ISI Short Book Reviews, 22:2, August 2002

Dynamic Models and Discrete Event Simulation John Wiley & Sons

To perform computer simulation successfully, two rather different sets of skills are required. One of these relates to programming: a simulation program should do what its author intends and do it efficiently. The other is concerned with the collection and analysis of data: statistical tools have to be used in order to obtain with a minimum of effort, accurate and reliable estimates for the desired performance measures. Dr Mitrani covers both of these aspects of the simulation method. The important topics of point and interval estimation, simulation efficiency and the analysis of simulation experiments are discussed in detail. This book, first published in 1982, will be useful to both undergraduate and postgraduate students taking courses on simulation in departments of computer science, operations research and statistics in universities and polytechnics. It will be of benefit also to practitioners in the field.

Conceptual Modeling for Discrete-Event Simulation
Springer Science & Business Media

In recent years, there has been a growing debate,

particularly in the UK and Europe, over the merits of using discrete-event simulation (DES) and system dynamics (SD); there are now instances where both methodologies were employed on the same problem. This book details each method, comparing each in terms of both theory and their application to various problem situations. It also provides a seamless treatment of various topics--theory, philosophy, detailed mechanics, practical implementation--providing a systematic treatment of the methodologies of DES and SD, which previously have been treated separately.

Graphical Simulation Modeling and Analysis
Springer Science & Business Media

During the 1990s the computing industry has witnessed many advances in mobile and enterprise computing. Many of these advances have been made possible by developments in the areas such as modeling, simulation, and artificial intelligence. Within the different areas of enterprise computing - such as manufacturing, health organisation, and commerce - the need for a disciplined,

multifaceted, and unified approach to modeling and simulation has become essential. This new book provides a forum for scientists, academics, and professionals to present their latest research findings from the various fields: artificial intelligence, collaborative/distributed computing, modeling, and simulation.

Discrete-event System Simulation CRC Press

This is the first book to make all the central concepts of discrete event simulation relevant for health technology assessment. Accessible to beginners, the book requires no prerequisites and describes the concepts with as little jargon as possible. It presents essential concepts, a fully worked out implementation example, approaches to analyze the simulations, the development of the required equations, model verification techniques, and validation. The book also covers various special topics and includes a real case study involving screening strategies for breast cancer surveillance.

Object-Oriented Discrete-Event Simulation with Java CRC Press

Discrete-event dynamic

systems (DEDs) permeate our world. They are of great importance in modern manufacturing processes, transportation and various forms of computer and communications networking. This book begins with the mathematical basics required for the study of DEDs and moves on to present various tools used in their modeling and control. Industrial examples illustrate the concepts and methods discussed, making this book an invaluable aid for students embarking on further courses in control, manufacturing engineering or computer studies.

Principles of Discrete Event Simulation

Springer Nature
Computer modeling and simulation (M&S) allows engineers to study and analyze complex systems. Discrete-event system (DES)-M&S is used in modern management, industrial engineering, computer science, and the military. As computer speeds and memory capacity increase, so DES-M&S tools become more powerful and more widely used in solving real-life problems. Based on over 20 years of evolution within a classroom

environment, as well as on decades-long experience in developing simulation-based solutions for high-tech industries, Modeling and Simulation of Discrete-Event Systems is the only book on DES-M&S in which all the major DES modeling formalisms – activity-based, process-oriented, state-based, and event-based – are covered in a unified manner: A well-defined procedure for building a formal model in the form of event graph, ACD, or state graph
Diverse types of modeling templates and examples that can be used as building blocks for a complex, real-life model
A systematic, easy-to-follow procedure combined with sample C# codes for developing simulators in various modeling formalisms
Simple tutorials as well as sample model files for using popular off-the-shelf simulators such as SIGMA®, ACE®, and Arena®
Up-to-date research results as well as research issues and directions in DES-M&S
Modeling and Simulation of Discrete-Event Systems is an ideal textbook for undergraduate and graduate students of simulation/industrial engineering and computer

science, as well as for simulation practitioners and researchers.

Discrete Event Systems Springer

"This book provides a comprehensive overview of theory and practice in simulation systems focusing on major breakthroughs within the technological arena, with particular concentration on the accelerating principles, concepts and applications"--Provided by publisher.

Discrete-Event Simulation IGI Global

The increased computational power and software tools available to engineers have increased the use and dependence on modeling and computer simulation throughout the design process. These tools have given engineers the capability of designing highly complex systems and computer architectures that were previously unthinkable. Every complex design project, from integrated circuits, to aerospace vehicles, to industrial manufacturing processes requires these new methods. This book fulfills the essential need of system and control engineers at all levels in understanding modeling and simulation. This book,

written as a true text/reference has become a standard sr./graduate level course in all EE departments worldwide and all professionals in this area are required to update their skills. The book provides a rigorous mathematical foundation for modeling and computer simulation. It provides a comprehensive framework for modeling and simulation integrating the various simulation approaches. It covers model formulation, simulation model execution, and the model building process with its key activities model abstraction and model simplification, as well as the organization of model libraries. Emphasis of the book is in particular in integrating discrete event and continuous modeling approaches as well as a new approach for discrete event simulation of continuous processes. The book also discusses simulation execution on parallel and distributed machines and concepts for simulation model realization based on the High Level Architecture (HLA) standard of the Department of Defense. Presents a working foundation necessary for compliance with High

Level Architecture (HLA) standards Provides a comprehensive framework for continuous and discrete event modeling and simulation Explores the mathematical foundation of simulation modeling Discusses system morphisms for model abstraction and simplification Presents a new approach to discrete event simulation of continuous processes Includes parallel and distributed simulation of discrete event models Presents a concept to achieve simulator interoperability in the form of the DEVS-Bus [Discrete-Event Simulation](#) John Wiley & Sons This volume provides comprehensive coverage of the state of the art in simulation conceptual modeling. The first section of the text discusses the purpose and requirements of a conceptual model. The next set of chapters provides frameworks and tools for conceptual modeling. The book then describes the use of soft systems methodology for model st
Modeling and Simulation of Discrete Event Systems John Wiley & Sons Bringing together an international group of

researchers involved in military, business, and health modeling and simulation, *Conceptual Modeling for Discrete-Event Simulation* presents a comprehensive view of the current state of the art in the field. The book addresses a host of issues, including: What is a conceptual model? How is conceptual modelin
Simulation Techniques for Discrete Event Systems Springer Science & Business Media This book aims to clarify exactly how simulation studies can be carried out in the system theory paradigm, while providing a realistically complete coverage of (discrete event) simulation in its more traditional aspects. It focuses on the subclass of predictive, generative and dynamic system models.
[Breadth-first Algorithm for Qualitative Discrete Event Simulation](#) Lulu.com The author offers the first text to cover all three areas of simulation-Model Design, Model Execution, and Execution Analysis-in one source. He focuses on model design (using an extension of object-oriented design called multimodeling) and algorithms for serial and parallel model execution. Also covered is the

SimPack simulation toolkit, with a full chapter devoted to using SimPack programs.

Theory of Modeling and Simulation Wiley-

Interscience

Dieses Buch ist eine unschätzbare Informationsquelle für alle Ingenieure, Designer, Manager und Techniker bei Entwicklung, Studium und Anwendung einer großen Vielzahl von Simulationstechniken. Es vereint die Arbeit internationaler Simulationsexperten aus Industrie und Forschung. Alle Aspekte der Simulation werden in diesem umfangreichen Nachschlagewerk abgedeckt. Der Leser wird vertraut gemacht mit den verschiedenen Techniken von Industriesimulationen sowie mit Einsatz, Anwendungen und Entwicklungen. Neueste Fortschritte wie z.B. objektorientierte Programmierung werden ebenso behandelt wie Richtlinien für den erfolgreichen Umgang mit simulationsgestützten Prozessen. Auch gibt es eine Liste mit den wichtigsten Vertriebs- und Zulieferadressen. (10/98)

Discrete-event

Simulation Academic Press

This book characterizes

the discrete event simulation and analysis using ExtendSim 10. It is a blend between theory and application leaning largely to the weight of the latter. Since the ExtendSim 8 version of the book (13 years ago) there has been significant improvements to ExtendSim, including the new Reliability library incorporated in this new, enhanced edition of the first book. There are two new chapters, one include a model simulating software reliability and inherent availability and the other is a guided project addressing the Launch Availability of a crew launch vehicle (CLV) for a limited launch window. For those unfamiliar with the first edition, there is coverage of just-enough queuing theory for building discrete event models, using the M/M/1 queuing problem involving warmup and steady-state phenomena, as well as methods for analysis and corrective adjustments. Probability distributions and their inverse transfers for random sampling are covered. The StatFit application is used for fitting and analyzing data, including goodness of fit testing. Also, there is an in-depth treatment of random number

generators. A bank model is used to demonstrate hierarchical modeling and basic simulation animation. Advanced queuing processes are addressed using a circuit board production example. Detailed modeling is covered using a delivery system transfer depot handing packages for domestic delivery. *Concepts and Methods in Discrete Event Digital Simulation* Cambridge University Press
Collecting the work of the foremost scientists in the field, *Discrete-Event Modeling and Simulation: Theory and Applications* presents the state of the art in modeling discrete-event systems using the discrete-event system specification (DEVS) approach. It introduces the latest advances, recent extensions of formal techniques, and real-world examples of various applications. The book covers many topics that pertain to several layers of the modeling and simulation architecture. It discusses DEVS model development support and the interaction of DEVS with other methodologies. It describes different forms of simulation supported by DEVS, the use of real-time DEVS simulation, the

relationship between DEVS and graph transformation, the influence of DEVS variants on simulation performance, and interoperability and composability with emphasis on DEVS standardization. The text also examines extensions to DEVS, new formalisms, and abstractions of DEVS models as well as the theory and analysis behind real-world system identification and control.

To support the generation and search of optimal models of a system, a framework is developed based on the system entity structure and its transformation to DEVS simulation models. In addition, the book explores numerous interesting examples that illustrate the use of DEVS to build successful applications, including optical network-on-chip, construction/building design, process control, workflow systems, and

environmental models. A one-stop resource on advances in DEVS theory, applications, and methodology, this volume offers a sampling of the best research in the area, a broad picture of the DEVS landscape, and trend-setting applications enabled by the DEVS approach. It provides the basis for future research discoveries and encourages the development of new applications.

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