1. Record Nr. UNINA9910300158303321

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Titolo	Modeling and Simulation : An Application-Oriented Introduction / / by Hans-Joachim Bungartz, Stefan Zimmer, Martin Buchholz, Dirk Pflüger
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2014
ISBN	3-642-39524-4
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (XIV, 413 p. 158 illus.) : online resource
Collana	Springer Undergraduate Texts in Mathematics and Technology, , 1867-5506
Disciplina	004
Soggetti	Computer mathematics Mathematical models Computer simulation Computational Science and Engineering Computational Mathematics and Numerical Analysis Mathematical Modeling and Industrial Mathematics Simulation and Modeling
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	1 Introduction -- 2 The necessary instruments in brief -- Part I Playing – deciding – planning: A modeling warm-up -- 3 Game theory -- 4 Group decisions -- 5 Schedules -- 6 Wiener processes -- Part II Traffic on highways and data highways: A trip through the simulation pipeline -- 7 Macroscopic simulation of traffic -- 8 Microscopic simulation of traffic -- 9 Stochastic traffic simulations -- Part III Dynamic systems: Cause, effect and interaction -- 10 Population dynamics -- 11 Controllers -- 12 Chaos theory -- Part IV Physics on the computer: The switch to number crunchers -- 13 Molecular dynamics -- 14 Thermal conduction -- 15 Fluid mechanics -- 16 Global illumination in computer graphics -- Closing remarks -- Bibliography -- Index.
Sommario/riassunto	This book provides an introduction to mathematical and computer-oriented modeling and to simulation as a universal methodology. It therefore addresses various model classes and their derivations. And it demonstrates the diversity of approaches that can be taken: be it

discrete or continuous, deterministic or stochastic. A common underlying theme throughout the book are the means in which one obtains practical simulation results from these different abstract models. Subsequent to a brief review of the mathematical tools that are required, the concept of the simulation pipeline, "from model derivation to the simulation", is applied to 14 example scenarios from diverse fields such as "Game theory - deciding - planning", "Traffic on highways and data highways", "Dynamical systems" and "Physics in the computer". Whether it is game theory or mathematical finance, traffic or control theory, population dynamics or chaos, or molecular dynamics, continuum mechanics or computer graphics - the reader gains insight into the world of simulation in a descriptive yet systematic way.