

The Nature of Computation

Cristopher Moore, Computer Science Department and Department of Physics and Astronomy, University of New Mexico, and External Professor, Santa Fe Institute, and **Stephan Mertens**, Institute of Theoretical Physics, Otto-von-Guericke University, Magdeburg, and External Professor, Santa Fe Institute

Computational complexity is one of the most beautiful fields of modern mathematics, and it is increasingly relevant to other sciences ranging from physics to biology. This book gives a lucid and playful explanation of the field, starting with P and NP-completeness. The authors explain why the P vs. NP problem is so fundamental, and why it is so hard to resolve. They then lead the reader through the complexity of mazes and games; optimization in theory and practice; randomized algorithms, interactive proofs, and pseudorandomness; Markov chains and phase transitions; and the outer reaches of quantum computing. At every turn, they use a minimum of formalism, providing explanations that are both deep and accessible. The book is intended for graduates and undergraduates, scientists from other areas who have long wanted to understand this subject, and experts who want to fall in love with this field all over again.

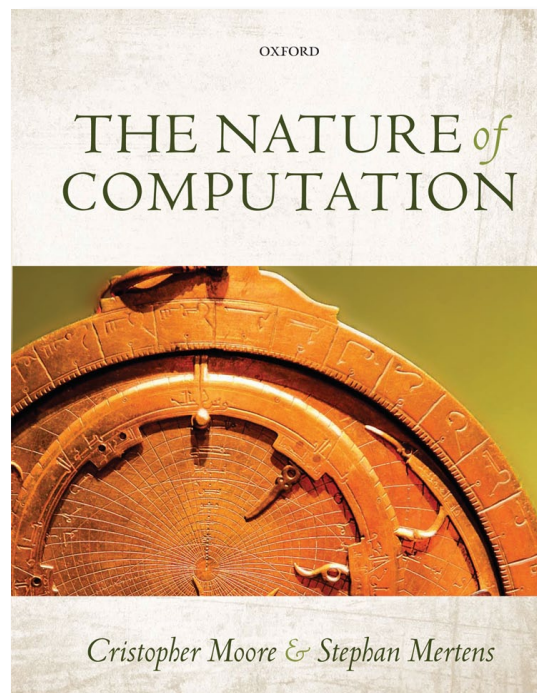
'A creative, insightful, and accessible introduction to the theory of computing, written with a keen eye toward the frontiers of the field and a vivid enthusiasm for the subject matter.'
Jon Kleinberg, Cornell University

'A fantastic and unique book - a must-have guide to the theory of computation, for physicists and everyone else.'
Riccardo Zecchina, Politecnico di Torino

'To put it bluntly: this book rocks! It's 900+ pages of awesome. It somehow manages to combine the fun of a popular book with the intellectual heft of a textbook, so much so that I don't know what to call it (but whatever the genre is, there needs to be more of it!).'
Scott Aaronson, MIT

'A treasure trove of ideas, concepts and information on algorithms and complexity theory. Serious material presented in the most delightful manner!'
Vijay Vazirani, Georgia Tech

1,004 pp, 338 b/w line illustrations, and 30 b/w halftones
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- ◆ Informal, enjoyable style
- ◆ Covers deep and recent results in theoretical computer science
- ◆ Authors are leaders in interdisciplinary work at the boundary between computer science and physics
- ◆ Many non-standard examples given
- ◆ Several structured problems (with solutions manual for teachers)
- ◆ Includes interdisciplinary topics like quantum computing, Monte Carlo algorithms and phase transitions
- ◆ For more information visit:
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For more details please contact:
UK/RoW: Rosanne Dawkins
+44 (0) 186535 4032
rosanne.dawkins@oup.com
US /Canada: Michelle Kelly
+1 212-726-6172
michelle.kelly@oup.com

