Discrete and Computational Geometry

By Satyan L. Devadoss, Joseph O'Rourke

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Discrete geometry is a relatively new development in pure mathematics, while computational geometry is an emerging area in applications-driven computer science. Their intermingling has yielded exciting advances in recent years, yet what has been lacking until now is an undergraduate textbook that bridges the gap between the two. *Discrete and Computational Geometry* offers a comprehensive yet accessible introduction to this cutting-edge frontier of mathematics and computer science.

This book covers traditional topics such as convex hulls, triangulations, and Voronoi diagrams, as well as more recent subjects like pseudotriangulations, curve reconstruction, and locked chains. It also touches on more advanced material, including Dehn invariants, associahedra, quasigeodesics, Morse theory, and the recent resolution of the Poincaré conjecture. Connections to real-world applications are made throughout, and algorithms are presented independently of any programming language. This richly illustrated textbook also features numerous exercises and unsolved problems.

- The essential introduction to discrete and computational geometry
- Covers traditional topics as well as new and advanced material
- Features numerous full-color illustrations, exercises, and unsolved problems
- Suitable for sophomores in mathematics, computer science, engineering, or physics
- Rigorous but accessible
- An online solutions manual is available (for teachers only). To obtain access, please e-mail: Vickie_Kearn@press.princeton.edu

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Discrete and Computational Geometry By Satyan L. Devadoss, Joseph O'Rourke Bibliography

- Sales Rank: #1007463 in Books
- Brand: Brand: Princeton University Press
- Published on: 2011-05-01
- Original language: English
- Number of items: 1
- Dimensions: 10.28" h x .97" w x 7.21" l, 2.21 pounds
- Binding: Hardcover
- 280 pages

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Editorial Review

Review

"*Discrete and Computational Geometry* meets an urgent need for an undergraduate text bridging the theoretical sides and the applied sides of the field. It is an excellent choice as a textbook for an undergraduate course in discrete and computational geometry! The presented material should be accessible for most mathematics or computer science majors in their second or third year in college. The book also is a valuable resource for graduate students and researchers."**--Egon Schulte, *Zentralblatt MATH***

"[W]e recommend this book for an undergraduate course on computational geometry. In fact, we hope to use this book ourselves when we teach such a class."**--Brittany Terese Fasy and David L. Millman, *SigAct News***

From the Back Cover

"This book is ideal for people who want to learn about the topic without wading too deeply into technical details. I really like the figures, and the writing style is very nice for students, with frequent jumps into exercises. The book favors topics that are intuitive, engaging, and easily grasped. It could form the basis of an excellent undergraduate-level course for students in computer science, applied mathematics, and pure mathematics."**--Samir Khuller, University of Maryland**

"I thoroughly enjoyed reading this book. It covers an incredibly diverse set of topics, ranging from elementary objects to deep mathematical concepts and important computational problems. Devadoss and O'Rourke have done a remarkable job of showing off the rich interplay between pure mathematics and computing that drives our research community. There really is nothing else like this on the market."**--Jeff Erickson, University of Illinois, Urbana-Champaign**

About the Author
Satyan L. Devadoss is associate professor of mathematics at Williams College. Joseph O'Rourke is the Olin Professor of Computer Science and professor of mathematics at Smith College. His books include "Geometric Folding Algorithms: Linkages, Origami, Polyhedra."

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