

Computer Animation, Second Edition: Algorithms and Techniques (The Morgan Kaufmann Series in Computer Graphics)

By Rick Parent

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Driven by the demands of research and the entertainment industry, the techniques of animation are pushed to render increasingly complex objects with ever-greater life-like appearance and motion. This rapid progression of knowledge and technique impacts professional developers, as well as students. Developers must maintain their understanding of conceptual foundations, while their animation tools become ever more complex and specialized. The second edition of Rick Parent's *Computer Animation* is an excellent resource for the designers who must meet this challenge. The first edition established its reputation as the best technically oriented animation text. This new edition focuses on the many recent developments in animation technology, including fluid animation, human figure animation, and soft body animation. The new edition revises and expands coverage of topics such as quaternions, natural phenomenon, facial animation, and inverse kinematics. The book includes up-to-date discussions of Maya scripting and the Maya C++ API, programming on real-time 3D graphics hardware, collision detection, motion capture, and motion capture data processing.

- New up-to-the-moment coverage of hot topics like real-time 3D graphics, collision detection, fluid and soft-body animation and more!
- Companion site with animation clips drawn from research & entertainment and code samples
- Describes the mathematical and algorithmic foundations of animation that provide the animator with a deep understanding and control of technique

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Editorial Review

Amazon.com Review
What many digital animators fail to realize is that someone needs to make the software that's used to bring images to life. Without the tools, the ideas can never be materialized. In *Computer Animation: Algorithms and Techniques*, the concepts and formulas used behind the scenes and under the hood of contemporary animation software are clearly explained for the programmer and the technical director.

Hardbound, liberally illustrated, and with an eight-page color gallery, there are six chapters and three appendices. The book starts with an overview of animation and works through some technical background information, and then delves into interpolation and basic techniques for representing 3-D motion and space on a 2-D display. Later chapters walk through advanced algorithms (kinematics, rigid body simulation, constraints) and then a discussion of ways to represent natural phenomena. There's also a focus on modeling and animating articulated figures. It's important to note that these chapters are not about which buttons to push in a given software package, but rather about the use and explanation of formulas for representing a specific simulation.

Perhaps the best feature of the book is the information and samples available on a companion Web site. Rather than include a CD-ROM, which raises the cost of the book and whose information can grow stale, the reader can find sample animations and ready-to-use code snippets, as well as links to other relevant Web sites.

There are any number of books available on computer animation software packages, but precious few on how they do what they do. *Computer Animation: Algorithms and Techniques* is an invaluable resource, a textbook for anyone interested in computer animation programming or for anyone who simply wants to get under the hood of their favorite animation application. --*Mike Caputo*

Review
"An invaluable resource for anyone interested in computer animation programming or for anyone who simply wants to get under the hood of their favorite animation application." ?Mike Caputo, President, Animation Bureau

From the Back Cover
"This book is hands-down my recommendation on the technical aspects of computer animation techniques. It's both a broad overview of the field, as well as a handy reference. I expect it to be a common sight on the bookshelves of students, teachers, graphics researchers, and practitioners in the field." ?Larry Gritz, Exluna/Nvidia

Whether you're a programmer developing new animation functionality or an animator trying to get the most out of your current animation software, **Computer Animation: Algorithms and Techniques** will help work more efficiently and achieve better results. For programmers, this book provides a solid theoretical orientation and extensive practical instruction-information you can put to work in any development or customization project. For animators, it provides crystal-clear guidance on determining which of your concepts can be realized using commercially available products, which demand custom programming, and what development strategies are likely to bring you the greatest success.

Features:
*Expert instruction from a pace-setting computer graphics researcher
*Provides in-depth coverage of established and emerging animation algorithms
*For readers who lack a strong scientific background, introduces the necessary concepts from mathematics and physics
*Illustrates advanced programming techniques with highly detailed working examples
*Companion website provides lecture notes from the author's course for professors, example animations based on the programs covered in the book, Java applets, and links to relevant websites
*Special contributions from Dave S. Ebert on Natural Phenomena in Chapter 5
*Special contributions from Scott King, Meg Geroch, Doug Roble, and Matt Lewis on Articulated Figures in Chapter 6

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Linda Soto:

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