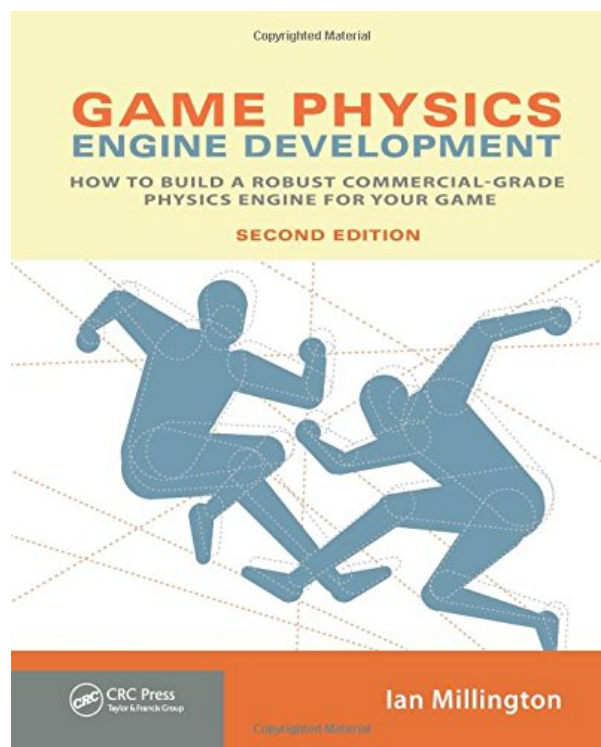
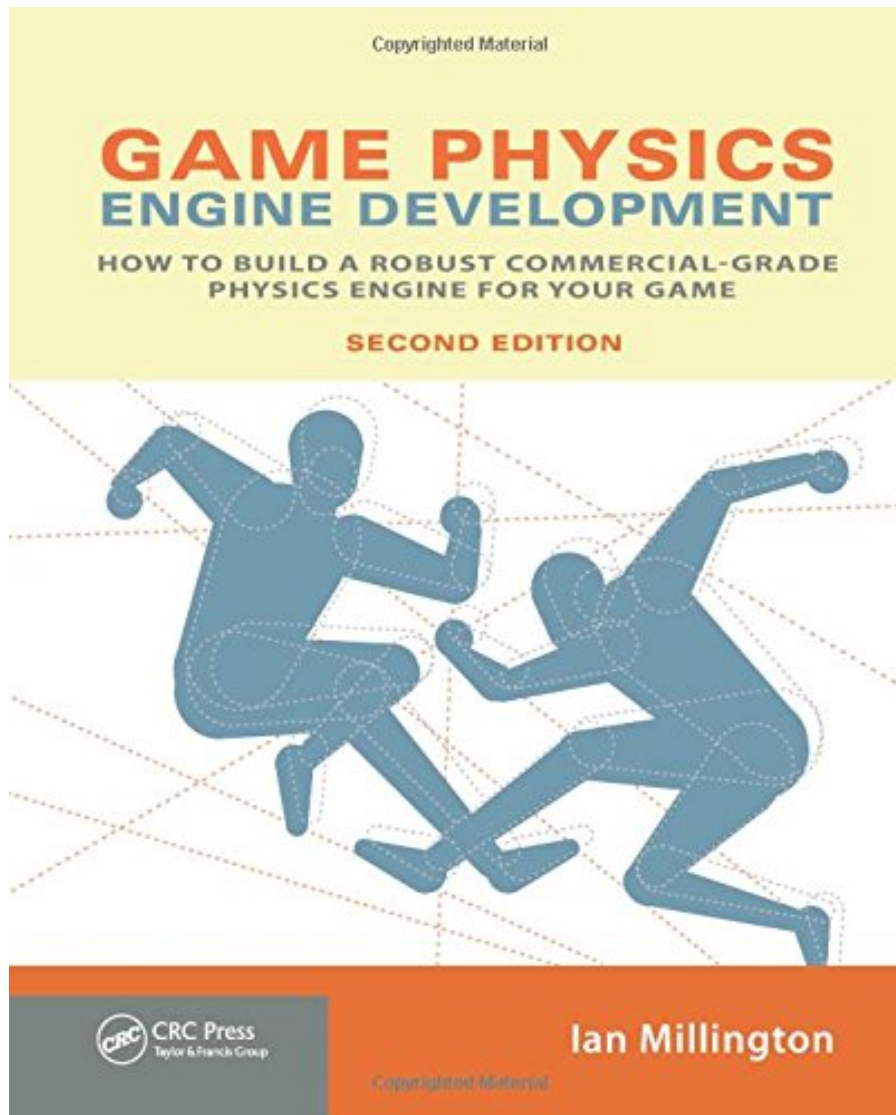


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## Review

Praise for 1st edition:

"The first game physics book to emphasize building an actual engine...his book fills a gap by demonstrating how you actually build a physics engine." - Dave Eberly, President, Geometric Tools.

"A competent programmer with sufficient mathematical sophistication could build a physics engine just from the text and equations--even without the accompanying source code. You can't say this about a lot of books!" - Philip J. Schneider, *Industrial Light & Magic*.

## About the Author

Ian Millington is a partner of IPR Ventures, a consulting company developing next-generation AI technologies for entertainment, modeling, and simulation. Previously he founded Mindlathe Ltd, the largest specialist AI middleware company in computer games, working with on a huge range of game genres and technologies. He has a long background in AI, including PhD research in complexity theory and natural computing. He has published academic and professional papers and articles on topics ranging from paleontology to hypertext.

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Physics is really important to game programmers who need to know how to add physical realism to their games. They need to take into account the laws of physics when creating a simulation or game engine, particularly in 3D computer graphics, for the purpose of making the effects appear more real to the observer or player. The game engine needs to recognize the physical properties of objects that artists create, and combine them with realistic motion.

The physics ENGINE is a computer program that you work into your game that simulates Newtonian physics and predict effects under different conditions. In video games, the physics engine uses real-time physics to improve realism.

This is the only book in its category to take readers through the process of building a complete game-ready physics engine from scratch. The Cyclone game engine featured in the book was written specifically for this book and has been utilized in iPhone application development and Adobe Flash projects. There is a good deal of master-class level information available, but almost nothing in any format that teaches the basics in a practical way. The second edition includes NEW and/or revised material on collision detection, 2D physics, casual game physics for Flash games, more references, a glossary, and end-of-chapter exercises. The companion website will include the full source code of the Cyclone physics engine, along with example applications that show the physics system in operation.

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## Most helpful customer reviews

18 of 19 people found the following review helpful.

A book to get you a real, working physics engine.

By Daniel Greenheck

Let's first say that I've seen my fair share of physics literature. I've pored over papers, tutorials, etc. with little to show beyond some simple collisions between spheres. What I really wanted to implement was something ideally "not" much more difficult: a rigid body simulation with simple primitives (spheres, boxes, planes) that collide and interact with each other, giving a realistic enough feel to build a game around.

Unfortunately, even this idea is extremely complex and difficult to implement. You would think the math and code would be fairly easy, and it actually is (depending on your math background. A few semesters of college calculus and physics is very helpful, but not required). But programming a physics engine is 40% math and physics and 60% being clever enough to get the computer to do what you want. Floating point errors, inaccuracies in integration and bugs you can't even imagine from the start all mess with your beautiful equations.

And this is where the author, Ian Millington, saves the day with this great book. All throughout, he lays down the challenges of building a physics engine and gives you realistic solutions that are explained very well. You build from the ground up: from a simple particle engine, to a mass aggregate physics engine, all the way to a full blown physics engine. Each chapter he describes what algorithms you need to implement and variations on those algorithms, providing pros and cons for each. I cannot TELL you how fantastic it feels to have an author tell you in an honest tone: here's where this works, here's where it doesn't. Never at any time do you feel that things are being hid behind a curtain of intellect and egomania. And if the author does hide any details, he tells you and with good reason.

In the end, if you plow through all 20 chapters with diligence and fortitude, you're going to end up with a working physics engine. It will be a physics engine capable of a lot of very cool things, but it isn't a finished product. And the author makes it very clear throughout the book that you will not end up with a spit polished physics engine to compete with the likes of Havok. It will be rough on the edges with plenty of room for improvement, but it gets the job done. The author helps you create a working model and leaves you with many options on how to improvement. However, those options require much more advanced coding.

This book provided me with exactly what I was looking for: the know-how and experience to create a physics engine for the everyday game designer. I highly recommend it. If you want to create something commercial, this is a great start, but you're going to have to buy some heavier books on top of this one if you want a very robust, optimized engine.

4 of 4 people found the following review helpful.

Great book to get a basic physics engine off the ground

By Amazon Customer

Overall a great book that enabled me to easily understand the basics of getting a physics engine off the

ground. Obviously the physics engine you end up with will be no Source or CryEngine, but it will be enough to produce an indie game. One thing I love about this author is he focuses on code rather than math. This book isn't a college course in physics, it's all about applying the most important laws of physics for simulations in games and it's all about code. Overall, I was satisfied with the physics engine I got out of it. The one thing I will say to potential buyers is that this is NOT the only book you will need if you want to make a physics engine. You will also need a book on collision detection, bounding volume construction, and spacial partitioning algorithms. This book gives a brief overview, but it only touches the surface. I would recommend "Real Time collision detection" by Ericson and "Mathematics for 3D game programming" by Lengyel as supplemental references.

2 of 2 people found the following review helpful.

Good intro to building an engine

By Luke

Gives a full tour through building a working physics engine, so it's really useful if you're getting started. However, it may feel a bit slow if you have a physics background, as this is intended at a more introductory level. The author hints at more advanced topics, such as alternative collision resolution techniques and optimization techniques, but doesn't go into detail. That said, the book does give a fully working engine, which counts for a lot.

Overall a solid foundation, but you may want to supplement with more advanced materials.

See all 18 customer reviews...

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