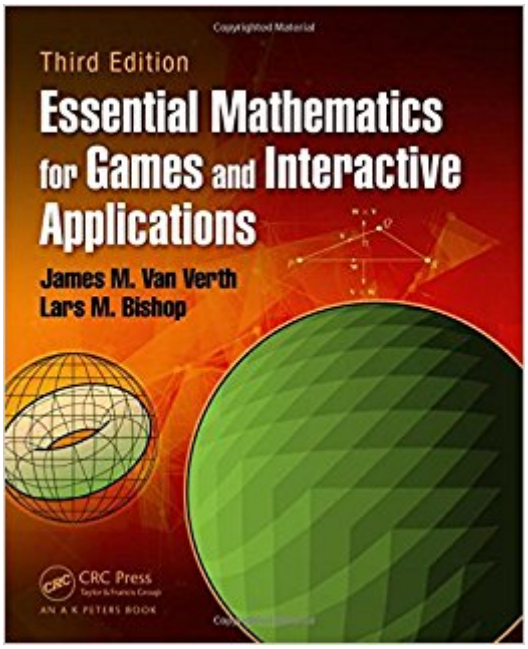
Essential Mathematics For Games And Interactive Applications, Third Edition



Synopsis

Expert Guidance on the Math Needed for 3D Game ProgrammingDeveloped from the authorsâ ™ popular Game Developers Conference (GDC) tutorial, Essential Mathematics for Games and Interactive Applications, Third Edition illustrates the importance of mathematics in 3D programming. It shows you how to properly animate, simulate, and render scenes and discusses the mathematics behind the processes. New to the Third EditionCompletely revised to fix errors and make the content flow better, this third edition reflects the increased use of shader graphics pipelines, such as in DirectX 11, OpenGL ES (GLES), and the OpenGL Core Profile. It also updates the material on real-time graphics with coverage of more realistic materials and lighting. The Foundation for Successful 3D ProgrammingThe book covers the low-level mathematical and geometric representations and algorithms that are the core of any game engine. It also explores all the stages of the rendering pipeline. The authors explain how to represent, transform, view, and animate geometry. They then focus on visual matters, specifically the representation, computation, and use of color. They also address randomness, intersecting geometric entities, and physical simulation. An Introduction to Creating Real and Active Virtual WorldsThis updated book provides you with a conceptual understanding of the mathematics needed to create 3D games as well as a practical understanding of how these mathematical bases actually apply to games and graphics. It not only includes the theoretical mathematical background but also incorporates many examples of how the concepts are used to affect how a game looks and plays. Web ResourceA supplementary website contains a collection of source code, supporting libraries, and interactive demonstrations that illustrate the concepts and enable you to experiment with animation and simulation applications. The site also includes slides and notes from the authorsâ ™ GDC tutorials.

Book Information

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Customer Reviews

Praise for Previous Editions:"Itâ ™s the book with all the math you need for games."â •Neil Kirby, Researcher, Alcatel-Lucent "Even though Iâ ™ve worked with these systems for years, this book showed me new ways of looking at several topics that make them easier to remember and use. For someone new to 3D programming, it is extremely usefulâ •it gives them a solid background in pretty much every area they need to understand."â •Peter Lipson, Toys for Bob, Inc.

James M. Van Verth is a software engineer at Google, where he works on GPU support for the Skia 2D Graphics Library. He has worked for Insomniac Games, NVIDIA, and Red Storm Entertainment and, for the past 17 years, he has been a regular speaker at GDC, teaching the tutorials "Math for Game Programmers" and "Physics for Game Programmers." He received a BA in math/computer science from Dartmouth College, an MS in computer science from the State University of New York at Buffalo, and an MS in computer science from the University of North Carolina at Chapel Hill. Lars M. Bishop is an engineer in the Handheld Developer Technologies group at NVIDIA. Prior to joining NVIDIA, he was the chief technology officer at Numerical Design Limited, leading the development of the Gamebryo3D cross-platform game engine. He received a BS in math/computer science from Brown University and an MS in computer science from the University of North Carolina at Chapel Hill.

Great review of the math required to build interactive 3D applications. Explanations were solid and the writing style is engaging without getting too informal.My only suggestion to the authors would be to, in a fourth edition, include exercises at the end of each chapter to make it more suitable as a pedagogical tool.

coverage is comprehensive, but a little quick. explanations are brief, linear algebra component assumes a lot of preknowledge. if you want to. learn this you will need a different book

I did not finish yet but I haven’t got bored either. It is very readable and understandable so far. I wish there were some(not many :)) practice exercises.

Essential Mathematics for Games and Interactive Applications by James M. Van Verth and Lars M. Bishop is a quality math book if I ever saw one. Strangely, the first edition came out in 2004 but the book was kind of off my radar until recently. This third edition was published in 2015 and seems very current. The authors here do a great job of explaining the material properly. I felt like they created a great foundation for learning these complex ideas and I appreciated the quality and readability of the code samples.The book starts with an overview of computer number representations, and goes into detail with the IEEE 754 floating-point standard. At first I assumed this was unnecessary detail, but actually itÃ¢Â Â™s pretty useful to understand and a good base to build on. They continue with vectors and points, linear transformations and matrices, affine transformations, orientation (including matrices, Euler angles, axis-angle, and quaternions), and interpolation (linear and curved). In the next section they transition to more graphic oriented topics such as: viewing and projection, geometry and programmable shading, lighting, rasterization, then a random chapter onÃ¢Â Â| random numbers, and finish off with intersection testing and rigid-body dynamics.Just looking at the table of contents is sometimes not enough to get a feel for the quality of the text, so I will reveal more. The beginning parts are really exactly what youÃ¢Â Â™d expect for a game math book. The basics of vectors, matrices, quaternions, etc. are the bread and butter for a 3D programmer. The coverage here is solid and great for a beginner. Advanced readers may not find any surprises, but itÃ¢Â Â™s still a good refresher. The interpolation chapter I found interesting, especially the detail into different types of curves and splines . This could be immediately useful for coding a skinned character or animating a camera in a game. Viewing and projection were given adequate coverage and are essential to anyone wishing to code a graphics engine themselves. The next chapter was particularly long and explained the programmable shader pipeline to great effect. The authors explained everything from color representation, vertex attributes, drawing geometry, fixed-function versus programmable, vertex and fragment shaders (aka pixel shaders), and texture mapping. Really a great introduction for anyone wanting to learn to code shaders themselves. Then they move onto lighting and go into the basic types (point, spot, directional, and ambient), surface materials, per-vertex and per-fragment lighting, combining with textures, and a few small sections of more advanced topics like normal mapping, physically based lighting, HDR, and deferred shading.Next up is rasterization, which was an awesome chapter that explained (in epic detail) how rasterizers work which I feel does help when you know whatÃ¢Â Â™s going on behind the scenes. I donÃ¢Â Â™t know of many other books that explain this part of the pipeline so well, so this was much appreciated. The random number chapter was also quite

informative. ItÃ¢Â Â™s easy to just call a function that spits out a number and not actually understand whatÃ¢Â Â™s happening. I found this portion of the book to be a nice surprise. Intersection testing was covered near the end, and it was one of the longer chapters. Almost anything you could think of was here: finding distances from lines and points, sphere/ray/plane intersections, axis-aligned bounding boxes (AABBs), swept spheres, object-oriented boxes, triangle intersection, and a simple collision system. Finally the book closes with a chapter on rigid-body dynamics. I actually purchased my copy mostly for the rigid-body material and I felt I learned a few useful things. Of course, it was only one chapter but some of the explanation was better than whole books IÃ¢Â Â™ve read on physics. Certainly it gave me a few things to research further, and I appreciate that.Overall I would say that Essential Mathematics for Games and Interactive Applications is an almost flawless textbook. I may be a great place to start for a beginner, and even intermediate to advanced readers may learn a thing or two. Some of the other game math books I recommend I read so long ago itÃ¢Â Â™s hard to make a direct comparison. But this title is certainly up there with the best. I would wholeheartedly recommend.

ok!

So Mathy!

This book is an extensive guide to the essential elements of any game engine.I spent a few months working through this tome on nights and weekends this past fall, 2016. I've had a number of months now to let the book sink in.If you're like me and don't have much of a formal math background, you'll definitely find much of the book challenging. I took not-infrequent breaks to deep-dive into a subject outside of the book (I ended up needing to learn the basics of calculus at the start of the Interpolation chapter, for example). But that's the real strength of the book -- it shows you what you ought to know. It says that these certain areas are important, and these other things are not. It ended up being an excellent starting point for a deeper understanding of the various subjects that are important when programming games.What prompted me to pick up this book was a month or so wasted working through a number of Khan Academy videos on linear algebra. I found myself lost in the weeds of arcane math, without any grounding at all in actual application of that math. (Most of those videos are useless to a practical-minded game designer, and it's extremely difficult to know what's useful and what isn't.) This book is absolutely not theoretical -- it is grounded in the practical. You will not waste your time.At first I thought that this book would only really be helpful if I wanted to

write my own game engine from scratch -- which is what I worked on while I was working through the book. But recently I've been getting back into Unity, and finding myself drawing upon basically every aspect of the book -- transformations, interpolation, geometry and shading, etc. It's helped make Unity feel much, much less complex -- I find myself being able to imagine precisely what's happening under the hood, and that's helped me not just write better scripts, but also just query the API documentation more efficiently. Finally, I feel like I know what I'm doing.The author of the book, James Van Verth, has done an excellent job not just with this text, but also with the community -- I had a number of questions about the text, and he was totally willing to answer my questions on Twitter. I was even able to discover a few small errors in the text, which he included in an Errata available on the website, which I'd recommend to any readers.

It's just plain GOLD: Best Math Book Ever for Programming, making it the best reference on the domain.All the math you'll ever need in 3D and Games Programming will be explained clearly, along with the best solution of the domains, with pro/cons each time.And Associated web site full of very very interesting links, along with demo/source code : http://www.essentialmath.com/I just refer to it any junior programmer lost as the "math compass" when I see them googling all day long trying to figure the maths behind 3D/game programming. Sometimes they get correct result, often not understanding what they copy/past, but it's rarely the best/good anwser each time, with all reference and explanations... I really wish it to be mandatory to read that when they were students...

My Essential Oil Private Collection Vol. 1 (Private Collection Essential Oils) Family Games: Fun Games To Play With Family and Friends (Games and Fun Activities For Family Children Friends Adults and Kids To Play Indoors or Outdoors) The Game Inventor's Guidebook: How to Invent and Sell Board Games, Card Games, Role-Playing Games, & Everything in Between! Prehistoric Games Pop-Up Board Game: 4 Games, Attached Reading Book (Pop-Up Board Games) Wee Sing Games, Games, Games Feature Detectors and Motion Detection in Video Processing (Advances in Multimedia and Interactive Technologies) (Advances in Multimedia and Interactive Technologies (Amit)) Managing Interactive Media Projects (Graphic Design/Interactive Media) Discrete Mathematics and Applications, Second Edition (Textbooks in Mathematics) Cryptography: Theory and Practice, Third Edition (Discrete Mathematics and Its Applications) Elements of Advanced Mathematics, Third Edition (Textbooks in Mathematics) Fractal Geometry and Dynamical Systems in Pure and Applied Mathematics I: Fractals in Pure Mathematics (Contemporary Mathematics) Essential Oils For Beginners: Essential Oils For Weight Loss: Essential Oils Natural Remedies: Essential Oils Summer And Winter Recipes: Nature's Best Kept Secret For Weight Loss And Balance Health