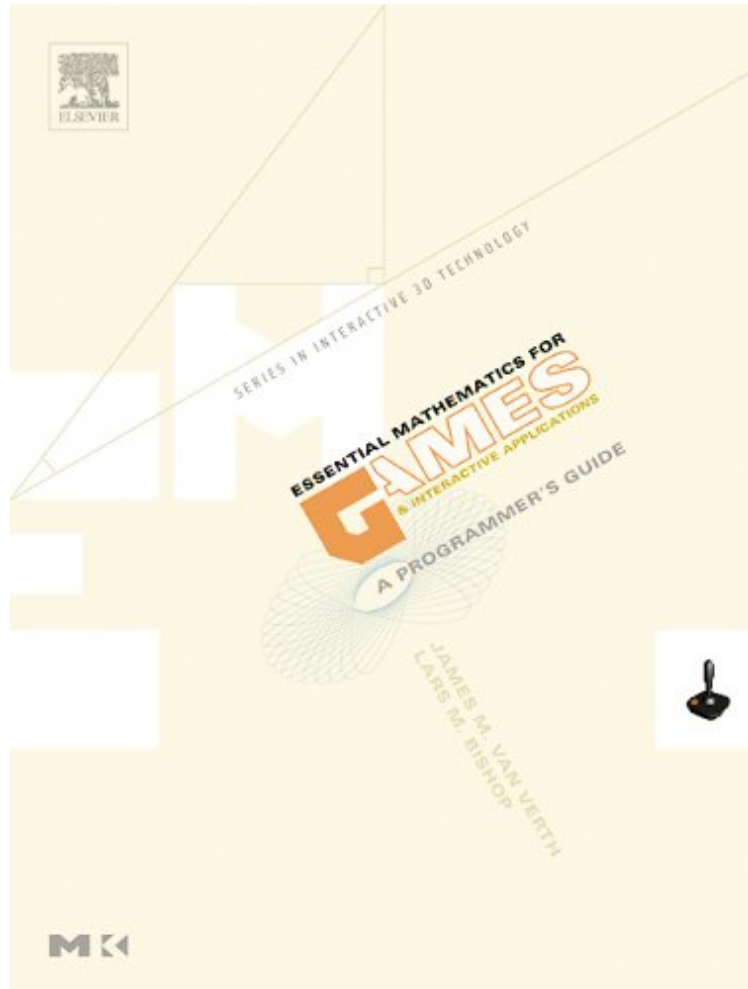


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## Essential Mathematics for Games and Interactive Applications: A Programmer's Guide (Morgan Kaufmann Series in Interactive 3D Technology)

James M. Van Verth, Lars M. Bishop  
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James M. Van Verth, Lars M. Bishop : Essential Mathematics for Games and Interactive Applications: A Programmer's Guide (Morgan Kaufmann Series in Interactive 3D Technology) before purchasing it in order to gage whether or not it would be worth my time, and all praised Essential Mathematics for Games and Interactive Applications: A Programmer's Guide (Morgan Kaufmann Series in Interactive 3D Technology):

3 of 3 people found the following review helpful. Essential Math a good basis By J. Meschke As a novice game programming hobbyist, I've written applications using the DirectX SDK to render 3D visuals without really

understanding what's happening behind the scenes. Applying a transformation matrix to a model and illuminating it with a spotlight just seemed to be magic beyond my understanding. This book has delivered enough information to get a good foundation in the understanding of the mathematics involved to bring points and images into a visual representation to the screen while going even further to discuss collision detection, interpolation, and rigid body dynamics. If the reader wanted to develop a 3D application on a platform with no native support or SDK, there's enough material in this book to give the reader a core background to develop a software solution. Even though portions of the graphics pipeline are automatically handled by an SDK or hardware, the concepts are presented so the reader is taken every step of the way. The reader should know algebra (of course), trigonometry, and calculus if they want to get something out of it. A history of linear algebra also helps, but it isn't necessary since the chapter on matrices that goes over the essential operations. The later chapters on collision detection and physics start getting more math-heavy. Having previously read a couple other books in the Morgan Kaufmann series: Real Time Collision Detection and Game Physics, I was expecting the discussions to be very similar; however, the reader would only get a basic understanding of the topics and would greatly benefit from continuing their reading into the aforementioned books. Overall, I enjoyed this book very much and it gets my approval for anyone wanting to get into game programming and 3D simulation. The author also provides many resources and accompanies the book with a CD of precompiled visual examples that should better solidify the user's understanding. As previously mentioned, Real Time Collision Detection and Game Physics make fantastic supplements to this book. 1 of 1 people found the following review helpful. A Deep, Technical Manual for Games Developers By RB This is a textbook and is aptly mathematically intensive. Most aspects of games programming are covered, along with lots of mathematical formulas. If your math is a bit fuzzy, you may want to brush up before tackling this book. Nevertheless, this book provides copious information for programmers who like to get their hands dirty. Definitely recommended for die-hard games developers who want to understand every aspect of games programming. 1 of 1 people found the following review helpful. Four Stars By Krush Good reference.

"Even though I've worked with these systems for years, I found new ways of looking at several topics that make them easier to remember and use. For someone new to 3D programming, it is extremely useful-it gives them a solid background in pretty much every area they need to understand." -Peter Lipson, Toys for Bob, Inc. Based on the authors' popular tutorials at the Game Developers Conference, Essential Mathematics for Games and Interactive Applications presents the core mathematics necessary for sophisticated 3D graphics and interactive physical simulations. The book begins with linear algebra and matrix manipulation and expands on this foundation to cover such topics as texture filtering, interpolation, animation, and basic game physics. Essential Mathematics focuses on the issues of 3D game development important to programmers and includes optimization guidance throughout.

"Not only is it an excellent introduction for someone who needs to come up-to-speed on the math behind games and graphics, it's a well-organized reference for anyone in the field. Short version: If you program graphics, let alone games, you need this book. Shelve it near your desk, next to your Foley and your Knuth. Highly Recommended." - Rick Wayne from a review in Software Development Magazine "This excellent volume is unique in that it covers not only the basic techniques of computer graphics and game development, but also provides a thorough and rigorous--yet very readable--treatment of the underlying mathematics. Fledgling graphics and games developers will find it a valuable introduction; experienced developers will find it an invaluable reference. Everything is here, from the detailed numeric issues of IEEE floating point notation, to the correct way to use quaternions and spherical linear interpolation to represent orientation, to the mathematics of collision detection and rigid-body dynamics." -David Luebke, University of Virginia, co-author of Level of Detail for 3D Graphics "When it comes to software development for games or virtual reality, you cannot escape the mathematics. The best performance comes not from superfast processors and terabytes of memory, but from well-chosen algorithms. With this in mind, the techniques most useful for developing production-quality computer graphics for Hollywood blockbusters are not the best choice for interactive applications. When rendering times are measured in milliseconds rather than hours, you need an entirely different perspective. Essential Mathematics for Games and Interactive Applications provides this perspective. While the mathematics are rigorous and perhaps challenging at times, Van Verth and Bishop provide the context for understanding the algorithms and data structures needed to bring games and VR applications to life. This may not be the only book you will ever need for games and VR software development, but it will certainly provide an excellent framework for developing robust and fast applications." -Ian Ashdown, President, ByHeart Consultants Limited "With Essential Mathematics for Games and Interactive Applications, Van Verth and Bishop have provided invaluable assistance for professional game developers looking to shore up weaknesses in their mathematical training. Even if you never intend to write a renderer or tune a physics engine, this book provides the mathematical and conceptual grounding needed to understand many of the key concepts in rendering, simulation, and animation." -Dave Weinstein, Red Storm Entertainment "Geometry, trigonometry, linear algebra, and calculus are all essential tools for 3D graphics. Mathematics courses in these subjects cover too much ground, while at the same time glossing over the bread-and-

butter essentials for 3D graphics programmers. In *Essential Mathematics for Games and Interactive Applications*, Van Verth and Bishop bring just the right level of mathematics out of the trenches of professional game development. This book provides an accessible and solid mathematical foundation for interactive graphics programmers. If you are working in the area of 3D games, this book is a 'must have.'" -Jonathan Cohen, Department of Computer Science, Johns Hopkins University, co-author of *Level of Detail for 3D Graphics*

From the Back Cover "Even though I've worked with these systems for years, I found new ways of looking at several topics that make them easier to remember and use. For someone new to 3D programming, it is extremely useful-it gives them a solid background in pretty much every area they need to understand." -Peter Lipson, Toys for Bob, Inc.

Based on the authors' popular tutorials at the Game Developers Conference, *Essential Mathematics for Games and Interactive Applications* presents the core mathematics necessary for sophisticated 3D graphics and interactive physical simulations. The book begins with linear algebra and matrix manipulation and expands on this foundation to cover such topics as texture filtering, interpolation, animation, and basic game physics. *Essential Mathematics* focuses on the issues of 3D game development important to programmers and includes optimization guidance throughout.

Features\*

- Covers concepts in sufficient detail for a programmer to understand the foundations of 3D without feeling overwhelmed by proofs and theory
- Companion CD-ROM with code examples built around a shared code base, including a math library covering all the topics presented in the book, a core vector/matrix math engine, and libraries to support basic 3D rendering and interaction
- Provides guidance for students trying to understand how games are actually developed, including optimization techniques

About the Authors

James M. Van Verth is a founding member of Red Storm Entertainment, a division of Ubi Soft, where he has been a lead engineer for six years. He has a B.A. in mathematics and computer science from Dartmouth College and M.S. degrees in computer science from the State University of New York at Buffalo and the University of North Carolina at Chapel Hill.

Lars M. Bishop is the CTO and software architect for Numerical Design Limited (NDL), where he has specialized in real-time 3D game rendering technologies for eight years. He holds a B.S. in mathematics and computer science from Brown University and an M.S. in computer science from the University of North Carolina at Chapel Hill.

About the Author

James M. Van Verth is a founding member of Red Storm Entertainment, a division of Ubisoft, where he has been a lead engineer for nine years. For the past eight years he has also been a regular speaker at the Game Developers Conferences, teaching the all-day tutorial "Math for Game Programmers, on which this book is based. He has a B.A. in mathematics and computer science from Dartmouth College and M.S. degrees in computer science from the State University of New York at Buffalo and 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, Lars was the Chief Technology Officer at Numerical Design Limited, leading the development of the Gamebryo 3D 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. His outside interests include photography, drumming, and playing bass guitar.