Learning Game Physics With Bullet Physics And OpenGL

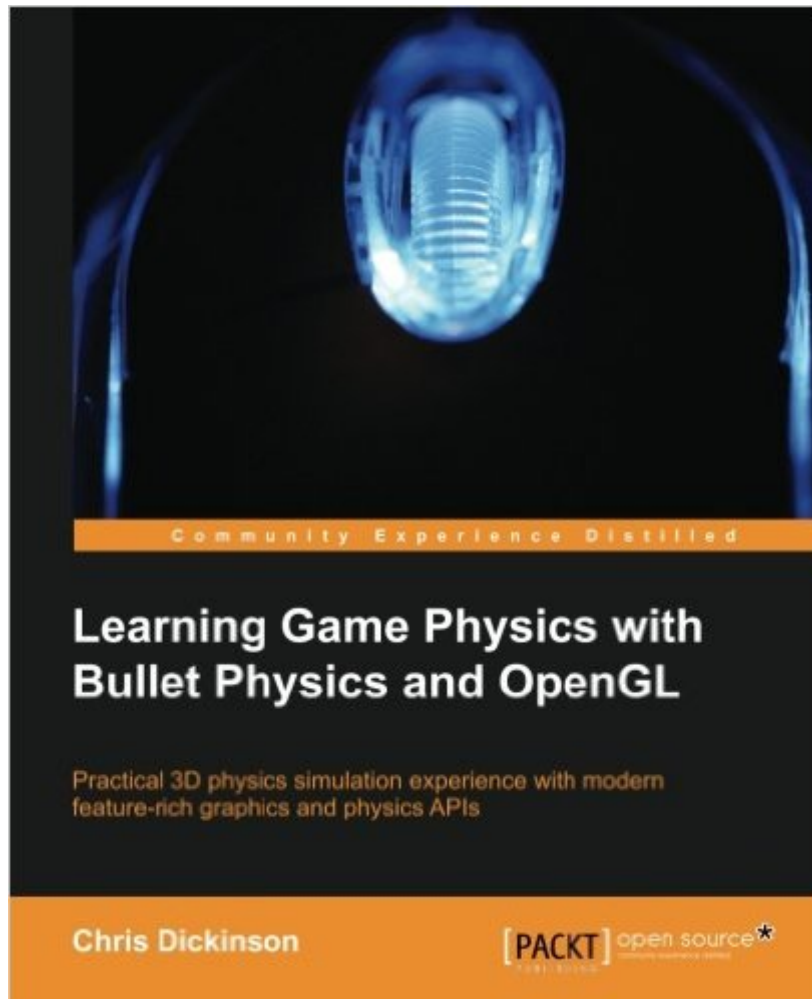**Learning Game Physics with Bullet Physics and OpenGL**

Practical 3D physics simulation experience with modern feature-rich graphics and physics APIs

Community Experience Distilled

Chris Dickinson

[PACKT] open source*

Synopsis

Practical 3D physics simulation experience with modern feature-rich graphics and physics APIs Overview Create your own physics simulations and understand the various design concepts of modern games Build a real-time complete game application, implementing 3D graphics and physics entirely from scratch Learn the fundamental and advanced concepts of game programming using step-by-step instructions and examples In Detail Physics simulation is an integral part of almost all game development projects as it is essential to the rules and feel of the game (gameplay) regardless of the project's scale. Bullet is a 3D Collision Detection and Rigid Body Dynamics Library for games, and special effects for film and animations. Bullet is integrated into many 3D modelers including Maya, Houdini, Cinema 4D, LightWave, and Blender. It is free for commercial use and open source under the permissive ZLib License. A comprehensive guide to start building games with the Bullet Physics library. Learn how modern physics engines work by implementing key features such as collision event systems, user input handling, and simulation of soft bodies. Then learn to control it all with forces, constraints, and robust object management. This book will reveal what's going on under the hood of two modern and feature-rich graphics and physics APIs; OpenGL and Bullet Physics. This book begins by teaching you to write your first OpenGL application, and then dives in to exploring the many features of the Bullet library in a straightforward manner. Each new feature expands upon the last, teaching you more about how physics is simulated in a video game, and how Bullet gives you the power to control every aspect of your simulation. You will learn how to render simple and complex shapes, apply some basic lighting, and construct a simple yet robust rendering system. From here, you will pull back the veil to see what's going on underneath Bullet Physics, and learn to implement key game logic features through this widely-used and extensive physics library. After you finish this book, you'll be armed with a wealth of knowledge to tackle the more advanced aspects of game graphics and physics going forward. What you will learn from this book Develop game applications from scratch; create a window, render the scene, and interact with your game through mouse and keyboard input Write OpenGL code at a low-level; render objects and understand every line of code you write! Understand how to keep the graphical and physical components of the simulation isolated for ease of understanding and future changes Learn how to properly handle the rendering and physics processing of multiple objects Explore the technologies and concepts behind modern game physics simulation through a practical understanding of Bullet Physics and OpenGL Build crucial features that are essential to all games; collision events, user input, object control, and trigger volumes Implement advanced physics simulation features like soft body physics, constraints, and collision filtering Delve into a robust and

modern physics engine game; and understand the challenges and solutions the developers of Bullet built into the library Approach A comprehensive set of straight-forward, easy-to-follow tutorials in OpenGL and Bullet Physics that will teach you how modern game physics and 3D graphics work.

Book Information

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Customer Reviews

Covering both physics and OpenGL in any meaningful way in only 100 pages is very ambitious, Learning Game Physics with Bullet Physics and OpenGL makes a half decent fist of it.I found the first and third chapter very promising; concise, well written, covering relevant points thoroughly and articulately. Unfortunately the rest of the book falls short with a number of faults, although many are too minor to warrant criticism. Still...The book's sub-title includes the line "modern feature-rich graphics" which is misleading at best, the OpenGL here is most assuredly not modern and only a few features (lighting, materials) are used. OpenGL is used as no more than a method of visualisation (with GLUT used to handle user input) and not covered in any real depth, the bulk of the book is dedicated to Bullet Physics.Disappointingly, Dickinson uses _very_ old OpenGL, in particular, glBegin() and glEnd() were deprecated with OpenGL 3.0, are inefficient and would be better replaced with vertex arrays. This choice is explained as being made to avoid complexity, however considering the level of the other material in the book that seems a poor excuse at best.Some specific shortcomings:The explanation of normals is a bit ropey; normals are attributed to points (which is wrong, since normals are perpendicular to lines or surfaces, a point can never have one).glPopMatrix() and glPushMatrix() are not "delimiter functions" nor are they like glBegin() and

glEnd().While functions are clearly explained, parameter lists are omitted, making it difficult to know which parameters to pass and in which order.Good (but not great), this book is certainly useful as a practical introduction to BulletPhysics, but not OpenGL. I found it to be a generally pleasant read with clear, concise, readable style marred by a few technical errors of varying severity.

This is a great introduction. When you finish, you will be able to do quite a few things. However at only 126 pages, if you have prior game and/or physics knowledge, it will go by quite quickly. Nothing is covered in great depth.

The book is OK, but the author seems to teeter sometimes between treating the user as being intermediate-to-advanced, and as just a beginner. The author also looses site that there are more operating systems in the world than Windows, and more ways to edit code than Visual Studio.For example, in the first chapter, you are treated as an intermediate developer by being told that they will not go over how to set up or reference external libraries. The author stated that one should learn this stuff if they are not already familiar. Then the author references a pre-setup project template that can be used as a starting place in what seems to be a move to target beginners. That template is for Visual Studio only. Why didn't the author simply state what libraries to tell the compiler to reference/link and then let the "intermediate" user do that -- or go find the info on how to do that elsewhere? Isn't this a book not really geared to beginners?Also, it seems the chapters sometimes give you a "starting point" with a code project -- but it is again in Visual Studio format. I am disappointed because the author seems to loose sight that not everyone uses his apparent preference of OS and tools. For example, there are places in the text where he mentions things that "....and let the Windows OS perform....". Why not just "....and let the OS perform...." and not make assumptions?Unfortunately, as a non-Windows user I can't get past the seemingly blatant advertisements for Microsoft. I can manage to pick out the pieces that I want to learn and study, but I think the author needs to back off on what appears to be an "everybody uses Windows" view.

Usually when you start using a new library specially the open source ones you have to go through all the documentation, which can be a little harsh if it is your first approach to that library, this book helps get a primer to Bullet physics which is a really powerful physics simulation library and free to use. I must warn you this is NOT a Tutorial, code along book, in the book you will see mostly theory of how the code works and you will have to read the book along the source code which is given within the book in order to have a clear understanding of what is going on.In my opinion the best

way to work around this book is to read both source code and book, and then implement it in your own code.Although it covers all the basics of bullet Physics it does miss a lot of important points, which as the book itself states. They are out of the scope of this writing , anyways It does teach enough for you to start "playing" around with this library and go further.In resume, it's a great book for the folks who already have solid experience with OGL and know at least the basics of Physics simulation, if you are just beginning coding you should just keep walking.

Short and to the point. Not a very thick book at all. I never used FreeGlut before so this was a first for me. Was a good read and making the programs examples I had little trouble with except for getting FreeGlut to work properly but that was my own fault. I would recommend this book for the hobbyist at home to give a read.

terrible book. teaches nothing.

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