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# Direct3D Rendering Cookbook



## Synopsis

50 practical recipes to guide you through the advanced rendering techniques in Direct3D to help bring your 3D graphics project to life

**About This Book** Learn and implement the advanced rendering techniques in Direct3D 11.2 and bring your 3D graphics project to life Study the source code and digital assets with a small rendering framework and explore the features of Direct3D 11.2

**A practical, example-driven, technical cookbook** with numerous illustrations and example images to help demonstrate the techniques described

**Who This Book Is For** Direct3D Rendering Cookbook is for C# .NET developers who want to learn the advanced rendering techniques made possible with DirectX 11.2. It is expected that the reader has at least a cursory knowledge of graphics programming, and although some knowledge of Direct3D 10+ is helpful, it is not necessary. An understanding of vector and matrix algebra is required.

**What You Will Learn** Set up a Direct3D application and perform real-time 3D rendering with C# and SharpDX Learn techniques for debugging your Direct3D application Render a 3D environment with lights, shapes, and materials Explore character animation using bones and vertex skinning Create additional surface detail using tessellation with displacement mapping and displacement decals Implement image post-processing tasks within compute shaders Use real-time deferred rendering techniques to implement improved shading for lighting and shadows Learn to Program the graphics pipeline with shaders using HLSL implemented by Shader Model 5

**In Detail** The latest 3D graphics cards bring us amazing visuals in the latest games, from Indie to AAA titles. This is made possible on Microsoft® platforms including PC, Xbox consoles, and mobile devices thanks to Direct3D – a component of the DirectX API dedicated to exposing 3D graphics hardware to programmers. Microsoft DirectX is the graphics technology powering all of today's hottest games. The latest version – DirectX 11 – features tessellation for film-like geometric detail, compute shaders for custom graphics effects, and improved multithreading for better hardware utilization. With it comes a number of fundamental game changing improvements to the way in which we render 3D graphics. Direct3D Rendering Cookbook provides detailed .NET examples covering a wide range of advanced 3D rendering techniques available in Direct3D 11.2. With this book, you will learn how to use the new Visual Studio 2012 graphics content pipeline, how to perform character animation, how to use advanced hardware tessellation techniques, how to implement displacement mapping, perform image post-processing, and how to use compute shaders for general-purpose computing on GPUs. After covering a few introductory topics about Direct3D 11.2 and working with the API using C# and SharpDX, we quickly ramp up to the implementation of a range of advanced rendering techniques, building upon the projects we create and the skills we learn in each subsequent chapter. Topics

covered include using the new Visual Studio 2012 graphics content pipeline and graphics debugger, texture sampling, normal mapping, lighting and materials, loading meshes, character animation (vertex skinning), hardware tessellation, displacement mapping, using compute shaders for post-process effects, deferred rendering, and finally bringing all of this to Windows Store Apps for PC and mobile. After completing the recipes within Direct3D Rendering Cookbook, you will have an in-depth understanding of a range of advanced Direct3D rendering topics.

## Book Information

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## Customer Reviews

Having fallen in love with C# some years ago, and more willing to lose my favorite toe than go back to C++ ever again, this book is exactly what I needed. SharpDX makes it possible to continue with XNA type graphics development in C# and DirectX 11, but it's not easy to get help or anything besides reference docs at the time of this review. This book serves as a comprehensive manual for SharpDX development that is timely and sorely needed. It's the only book of it's kind and fills an important and useful purpose, what else needs to be said? If you've been messing with SharpDX, buy this book and read it cover to cover.

The whole book contains a lot of recipes but I do not know if this was a best solution and form. For instance the first two chapters take almost 90 pages of the book and they introduce to the framework and DirectX. The recipes included in those chapters create a steps in huge tutorial. I would prefer much loose style of a recipe. Still the chapters have good quality. When we finish the

introduction then we are able to get more interesting topics. Basically all you need to know in modern graphics programming is here! Decent number of examples, codes, pictures, diagrams is another advantage. Probably most of people should understand the content and be able to implement examples on their own. We have topics about loading meshes (from FBX files converted to CMO). There is also a great and very detailed chapter about skinning and mesh animations. Another worth to mention topics are about Displacement and Normal Mapping - plus Hardware Tessellation as a background topic for that. Chapter regarding Image Processing seems to be a standard in all GFX books but this time I was happy to see all the techniques using Compute Shaders. Incorporated with lots of examples and diagrams should be easy to understand. After reading the chapter about Physics readers will be able to implement nice looking water and use Bullet physics. There is also an interesting chapter about deferred context in D3D. It seems that they are powerful, but everyone expected that this technique will provide more performance improvements. As a background examples for deferred context there are recipes about rendering environment maps. The last two chapters describe Deferred rendering and how to connect D3D with Xaml and Windows 8.1. A lot of knowledge + interesting topics + good execution. Worth buying!

I loved this book, even if you are not a C# developer, you can port/include these techniques to/in your C++ engine. If you are just starting out, this may not be the book for you, if you have been working with earlier versions of DirectX and looking for an interesting read, then I don't think you can go wrong with this book.

The best book for DirectX there is. Whether you're serious about learning DirectX or recreational reading and casual learning DirectX, this is the book for you. It is the only book I know that covers development of DirectX programs in .NET and C# using SharpDX library. It really is one of a kind. Also it covers DirectX 11, which at the moment is the newest DirectX technology. The book takes you through the basics and slowly teaching you to do better and nicer things. If you write the code as you read the book, you'll grasp the techniques very fast. The chapters are step-by-step linked to each other. It is very well written, the author is really great person, who knows what he's doing. Also the text is very easy to read and understand. Everything is well explained. You do not need to have any previous experience with DirectX. You'll find everything you need in the book.

As a basic introduction to how DirectX 11 usage, this book seems great so far. I've used previous versions of DirectX, so I can't comment on how clear it would be for a complete beginner, but for

someone who already knows the basics it was certainly very easy to follow. And it does a great job of explaining advanced fundamentals, touching on most topics you'll need to understand as a DirectX programmer, which is great. You'll find information on the latest 11.1 and 11.2 interfaces as well, in case you want to target Windows 8-only features. That said, past the first few chapters (which describe both the native interfaces and the C# interfaces), the book focuses almost entirely on C#/ .NET examples. As a developer who has avoided using managed code in games, this is not the way I'd personally prefer to see my examples. On the other hand, C# examples are almost always cleaner than the equivalent C/C++ code would have been, just due to the overhead of the native COM interfaces. Overall it seems like a great buy if you're looking to update your skills to cover the latest DirectX technologies.

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