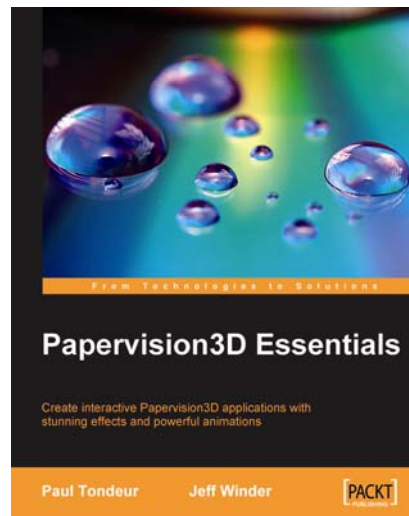




Papervision3D Essentials

Paul Tondeur
Jeff Winder



Chapter No. 8 **"External Models"**

In this package, you will find:

A Biography of the authors of the book

A preview chapter from the book, Chapter NO.8 "External Models"

A synopsis of the book's content

Information on where to buy this book

About the Authors

Jeff Winder is an independent Flash developer living and working in Amsterdam, the Netherlands. He discovered Flash and ActionScript in 2003, mainly creating timeline animation, but was soon gripped by non-timeline coding. He has a special interest in new technologies that are related to Flash, especially open source projects such as WiiFlash, FLARToolKit, and Papervision3D. Jeff acquired an MSc in Social Psychology at the University of Amsterdam. He is also a passionate musician, playing guitar and drums. Since 2006, Jeff has been self employed and working for leading agencies. You can contact him at <http://www.jeffwinder.nl>.

[Jeff wrote chapters 1, 3, 5, 6, 10, 11, and 12.]

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I am not sure whether I should thank my close friends and family for their warm support, or apologize, for not being there for a while. Anyway, I deeply appreciate your patience and understanding, so to everyone who kept asking how the book was coming along—thank you!

I would also like to thank Paul. Writing this book together has been a rewarding experience.

Paul Tondeur is as an Internet entrepreneur who lives and works in Amsterdam, the Netherlands.

He started as a freelance PHP and Flash developer during his study of multimedia technology in 2003. After successfully completing his study, he was asked to become the CTO of a Dutch online marketing agency in 2004. At this company, he developed a strong interest for 3D and got the chance to get professionally involved as the technical lead for serious Second Life projects. However, Second Life was too limited to fulfill his needs to create accessible interactive multiplayer 3D content on the Web, and this is when he found out about Papervision3D during the early days. Because of his passion for the Flash platform, this was love at first sight.

At the beginning of 2009, Paul decided he had to take more advantage of his technical skills as an Internet entrepreneur. Currently he helps other companies as a Unity, Papervision3D, Red5, and mobile streaming consultant. Together with a team of people around him, he is also involved in creating a browser-based MMO, incorporating the usage of Red5, Unity, Flash, and Papervision3D. You can contact him at <http://www.paultondeur.com>.

[Paul is the initiator of this book and wrote chapters 2, 4, 7, 8, 9, and 13.]

I would like to thank my family and friends who have been enormously patient and supportive while I was working on this book and had no time for social life. Especially my girlfriend—Marloes—has been of great support. She kept me inspired and motivated when I was working around the clock to finish this challenging task. Last, but not least I want to thank Jeff for being such an encouraging partner to write this book with.

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We both would like to thank the following people or groups of people. First of all, this book would never have been possible without the knowledge shared by the Papervision3D community, which we experienced as open and enthusiastic. The many blogs and tutorials have been an important source of information, along with all the questions and answers on the mailing list.

We also would like to express our gratitude towards the reviewers, proofreaders, editors and modelers. The meticulous inspection of the manuscript by the reviewers—Stuart, Trevor, and Patrick—has been of great value. The cooperation with the editors at Packt Publishing —James, Darshana, Zainab, and Gaurav—has been inspiring and satisfying.

We very much appreciate the answers that the Papervision3D team gave us when we had some questions left. Finally, a special thanks to Janneke de Koning and Job Steggink, who created and animated the 3D model used in the book.

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Papervision3D Essentials

This book is about Papervision3D, an open source engine that brings 3D to the Flash Player. Papervision3D is an easy-to-use library written in ActionScript 3.0 that allows developers to create 3D in Flash. Papervision3D lets you build real-time 3D, giving you the tools to create exciting and interactive 3D experiences. From simple banners to advanced online campaigns and from creative portfolios to shooter or racing games, the possibilities are numerous. Because it runs in Flash, you can easily put it on the web, or make it available as installable AIR application.

Getting started with Papervision3D can be quite a challenge due to several initial steps that need to be taken such as downloading the source, installing new tools, and unfamiliarity with custom classes. This book shows you how to download Papervision3D and how to make it work in Flash, Flex Builder, and Flash Builder. A short and down-to-earth introduction to working with classes is included and in a walk-through you will build your first application. From here on, we take a closer look at the engine, discussing a broad range of topics. We will examine how to work with built-in 3D objects, use cameras, and apply materials. Many examples and demos are included, illustrating how to animate cameras, objects and light, and load custom-made models. To add more realism to your objects, you will learn how to add special effects and shaders. After reading this book, you will also know how to optimize the performance and quality of your projects.

This book covers the basics, but is by no means only for beginners. The thorough explanation of the engine and the numerous tricks and tips make it a valuable resource for every Papervision3D user.

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What This Book Covers

Chapter 1—Setting Up is a step-by-step introduction on how to configure Flash CS3, Flash CS4, Flex Builder, or Flash Builder for creating Papervision3D projects. Several ways of downloading the Papervision3D source code are discussed and you will publish an example project to make sure you have configured your authoring tool correctly to get along with this book.

Chapter 2—Building Your First Application will guide you through the steps that lead to building your first Papervision3D application. If you are new to working with classes and object-oriented programming, a brief introduction will help you on your way. Once this topic has been covered, the chapter continues by explaining what a scene in Papervision3D is made of and how to build a basic application.

Chapter 3—Primitives covers primitives, which are basic building blocks for Papervision3D applications. It shows how to create a plane, sphere, cylinder, cone, cube, paper plane, and an arrow. An explanation about how vertices and triangles form a 3D object is included.

Chapter 4—Materials examines how to use the available Papervision3D materials and properties such as interactivity, smoothing, animation, and tiling. You will build a 3D carousel, made of materials that are discussed throughout this chapter.

Chapter 5—Cameras explains how to affect the way you see objects in 3D space by altering the settings of the camera. Some of these settings originate in real-world cameras such as focus, zoom, and field of view. Other settings are common in 3D, but don't have an equivalent in the real world. All available camera types will be discussed. By the end of this chapter, you will know how to work with a target camera, free camera, debug camera, and spring camera.

Chapter 6—Moving Things Around discusses how to animate your 3D objects and camera by moving or rotating them. You will not only learn how to manually animate objects on enter frame but will also be shown how to use Tweeners—a tweening engine that makes it very easy to animate your objects and add all kinds of easing.

Chapter 7—Shading introduces the presence of light in order to add several levels of shade to 3D objects. All available shading types will be discussed, from very lightweight flat shading, to better looking but heavier shading types such as Gouraud shading, cell shading, Phong shading, bump maps, and environment maps.

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Chapter 8—External Models is about working with models and animated models that have been created in external programs. A handy list of advice is included that can be used by modelers who are in need of creating a model for use in Papervision3D. The workflow between a few modeling tools and Papervision3D is explained in detail. You will learn how to export models from Autodesk 3ds Max, Maya, SketchUp, and Blender. Several models will be imported into Papervision3D such as the Utah teapot and an animated mill.



Chapter 9—Z-Sorting covers how Papervision3D draws its renders to the viewport and the issues with determining which object should be drawn first. Several strategies to solve these issues are discussed such as viewport layers and quad tree rendering. Examples that are made with an external 3D model will be used to demonstrate these solutions.

Chapter 10—Particles discusses the lightweight particle object, which is a 2D graphic that always faces the camera. The concept of a particle is discussed in detail and we will walk through several examples that demonstrate how you create particle materials, particle fields, emitters, and billboards. We will take a look at Flint, which is an external particle system that provides easy ways to emit particles.

Chapter 11—Filters and Effects covers how you can add all kinds of filters and effects to your renders. Adding glows, shadows, blurs, blend modes and alphas are demonstrated in detail, as well as effects like fire, fog and reflection. We will create an illusion of depth of field by applying several levels of blurs to objects, depending on their distance to the camera.

Chapter 12—3D Vector Drawing and Text covers vector-based shapes in 3D space. They can either be lines, shapes, built-in vector text, or vector text generated by an external typography tool.

Chapter 13—Optimizing Performance discusses how to speed up the performance of your Papervision3D applications. An introduction on what performance exactly is will be given, followed by a broad range of tips and tricks that guarantee the best possible performance.

While reading through chapters you might come across the following icon: . The icon will be combined with the name of an example. The name in between the icons refers to two things—to the full working example in the code bundle and to an appendix in the code bundle. For example, if you see something like  Text3DExample, this indicates that the code for Text3DExample is available as a working project that can be found in the code download.

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