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Mastering Lumion 3D

Master the art of creating real-time 3D architectural visualizations using Lumion 3D

Ciro Cardoso

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BIRMINGHAM - MUMBAI

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First published: December 2014

Production reference: 1221214

Published by Packt Publishing Ltd.
Livery Place
35 Livery Street
Birmingham B3 2PB, UK.

ISBN 978-1-78355-203-0

www.packtpub.com

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About the Author

Ciro Cardoso is a self-taught 3D artist and training author specialized in architectural visualization. He started off painting and drawing traditionally and then got into 3D graphics in 2000.

In 2005, he was running his own small multimedia business working on projects as diverse as graphic designing, CAD services, and architectural visualization projects. More recently, he started using Lumion and game engines for multimillion dollar projects in the United Kingdom, Portugal, the Netherlands, Angola, and Cape Verde. He is quite conversant with software in general, with extensive expertise in Maya, 3ds Max, AutoCAD, SketchUp, V-Ray, Corona, Photoshop, Lumion, Unreal 4, and Bentley MicroStation. He is also the author of *Getting Started with Lumion* and *Lumion 3D Cookbook*, both by Packt Publishing.

He now lives in London, working as an architectural visualizer, and does voluntary work teaching 3D. He can be reached through his website, `http://www.cirocardoso.net`.

Firstly, I would like to express my gratitude towards my family for making me a curious person. A big thanks goes to my wife for her support, love, and patience throughout the process of writing this book, even if that meant staying home during weekends. I believe that without her, this book would not have been possible.

I would like to express my thanks to the Packt Publishing team for the opportunity to author this book, and also for the effort and support to produce this book.

About the Reviewers

CJ Arquitecto is a young Portuguese architect born in Lagos, Portugal, in June 1984.

At the age of 24, in 2008, he finished his degree in Architecture from the University of Porto, also known as the Faculty of Architecture of the University of Porto, designed by architect Siza Vieira. Since 2011, he started using Lumion, while working on urbanism projects in his 3D works designed for Angolan customers. Parallel to his professional career, he defined the importance of photography and design as an intimate relationship. Following this, he did three photography expositions in Portugal and published them on the Web. He has participated in several national and international design contests and won two architectural prizes. Also, he has been developing several architectural projects, mostly in Angola; these include projects that range from residential houses to sports complex centers. He had reviewed books on Lumion 3D in 2013, which has led him to have a part in reviewing this book.

Ahmed Osama El-Bakry was born on August 16, 1990, in Cairo. He got his BSc degree from Ain Shams University Urban Planning and Design Department in July 2012. Now, he works as a teaching assistant at Ain Shams University Urban Planning and Design Department. His cumulative ranking is first among his colleagues. Then, he began his premaster studies for 1 year at the same college. After graduating from there, he recently joined the IUSD Master's program jointly organized by the University of Stuttgart, Germany and Ain Shams University, Egypt.

Bakry began his practical work while he was studying, by participating in urban competitions. He works as an executive engineer for architectural interior projects. He works as a freelancer for several urban and architecture projects, especially in Saudi Arabia. As an undergraduate, he participated in a student exchange program between Ain Shams University; Artesis University College, Antwerp, Belgium; and Ecole Nationale Supérieure d'Architecture de Paris-Belleville in Paris, France in December 2010, concerning urbanism and future developments. He attended several conferences and workshops regarding sustainable urbanism and different and contemporary planning approaches and development cooperation between countries, which are organized by UN-Habitat, GIZ/BMZ in Germany. Eventually, he could deal with several engineering and graphical programs that led him to be committed to have a part in reviewing *Lumion 3D Cookbook*, *Packt Publishing*. Now, he is a cofounder of Square Studio for engineering consultancy.

Peter-Daniel Fazakas is an architect and designer born in Bucharest, Romania. Growing up in a family of intellectuals, scientists, and artists, he was fascinated, from early childhood, with hand drawing and CAD software. He decided to study architecture at the Ion Mincu University of Architecture and Urbanism in Bucharest, where he later graduated with an M Arch degree.

Working as an architect and art director in Romania, France, Cyprus, and China, he gained experience in architecture, graphic design, 3D rendering, 3D animation, and augmented reality, being fascinated by the new computer software. Currently, he lives in Shanghai and is involved in large-scale architectural projects.

Peter's personal website is `www.peter-fazakas.com`.

Filip Joveski is an architect and a 3D artist. He was first introduced to the 3D world in 2002 in a 3D-modeling class at the university he attended. After getting his degree in architecture, he worked in several firms in different countries and for a number of demanding clients.

He is currently employed in an architectural office in Germany, where he works as the head of the visualization team, creating images, animation, and illustrations, and has many projects behind him. He has designed various types of objects and spaces, including houses, apartments, lofts, restaurants, and unique interior designs from the beginning—sketching the floor plans, sections, 3D modeling, and renderings.

He is proficient with software in general, and has extensive expertise in 3ds Max, ArchiCAD, Maya, AutoCAD, SketchUp, Photoshop, Lumion, and Artlantis. He also expresses his creative side through his paintings and sculptures. He has extraordinary hand-drafting skills. His sense of color, texture, and depth has greatly helped him in the world of 3D modeling and visualization.

Gianfranco Maiorano is a creative and talented architect and an EU-licensed construction engineer based in London, UK, since 2013. He studied and completed his Master's degree in Architecture and Construction Engineering from the University of Bologna, Italy. He has experience in both public and private projects in the UK and Italy, including several competition submissions.

Gianfranco is the Founder and Director of gfm Studio Lab. Established in August, 2014, and based in London, gfm Studio Lab provides services from architecture to design and art for architectural firms and private clients, particularly working in the retail and residential sectors.

Since childhood, Gianfranco has always been very passionate about architecture. Possessing a natural intellectual capacity and curiosity about his chosen field, he is driven by a keen interest in researching contemporary architecture, art, and digital tools, especially in connection with quantum physics and parametric and generative techniques for architecture. He has exceptional technical expertise with regards to a wide range of software from 3D modeling and BIM to visualization and animation.

Gianfranco finds inspirations from artists such as Lucio Fontana, Antony Gormley, and Anish Kapoor, and architects such as Renzo Piano, Ben van Berkel, and Rem Koolhaas. He can be contacted through his website, `www.gianfrancomaiorano.com`.

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Preface

Welcome to *Mastering Lumion 3D*. Let me start by thanking you, the reader, for picking this book as a tool to help you throughout the process of using Lumion real-time technology.

Lumion can be an intuitive tool, but that doesn't mean we can automatically produce a better architectural visualization. The reason why I wrote this book was because, like you, the first time I picked up Lumion, I felt that there was something missing on my projects.

Mastering Lumion 3D covers the process of picking a 3D model, preparing it, and then start building layers on top of layers of detail, by using textures and optimized 3D models. However, we don't stop here, because several chapters are dedicated exclusively explaining how to use Lumion's effects and other special features to take your project to an expert level.

I wrote this book in a way that will hopefully cover all the questions you may have when starting the first steps with Lumion. On the other hand, if you are an intermediate or advanced user, you can find some unique techniques that will make you look to Lumion in another perspective. The journey to write this book was filled not only with my experience, but also from what I learned while working with other great professionals.

You may find it strange that there isn't any example to follow or project files to be used. The reason is because to fully understand and master Lumion, you have to apply all of these techniques on your own projects. Initially, this can be something daunting, but the book is prepared in such a way that you can gradually build your confidence and skills using Lumion.

And my final advice is not to be afraid to try and fail. Failing is an important part of the process to learn and deeply understand Lumion.

What this book covers

Chapter 1, *Getting Ready for Lumion 3D*, focuses on preparing a 3D model to be used in Lumion 3D. A special section is used to explain why materials are a key aspect to ensure a smooth and fluid workflow when importing 3D models into Lumion. Common problems and how to solve them will ensure you start with the right foot.

Chapter 2, *Creating a Project in Lumion*, puts the 3D model in standby while you prepare a scene in Lumion. This involves creating a project and tweaking the terrain to accommodate the 3D model. Layers and workflow optimization are covered to help you get useful and practical professional habits.

Chapter 3, *Importing 3D Models*, explains how to import an external 3D model and place it inside Lumion. A time-saving feature is explained to enable the reload of new geometry, avoiding importing the same 3D model multiple times.

Chapter 4, *Applying and Creating Materials*, focuses entirely on how to improve the 3D model's look using Lumion's realistic materials. There are at least three possibilities that are covered giving you the insight to choose the one that best suits the project.

Chapter 5, *Creating Your 3D World*, is one of the high points in the book because it is entirely dedicated to explain how to use Lumion's native 3D models and completely control them in order to start populating and creating a 3D environment.

Chapter 6, *Lighting in Lumion*, is a small yet powerful chapter to improve and optimize lighting in Lumion. Exterior lighting is usually covered by Lumion's Sun and Sky system. However, for interior scenes, lights need to be used. Global illumination is explained to create perfect interior scenes.

Chapter 7, *Creating Realistic Visualizations*, starts explaining how to use Lumion's effects in the Photo mode to produce believable visualizations by mimicking what is present in the real world.

Chapter 8, *Non-photorealistic Visualizations with Lumion*, explores an almost unknown side of Lumion's effects. This chapter explains how to produce conceptual and technical illustrations.

Chapter 9, *Animation Techniques*, brings life to a project by exploring the Lumion's animation system. Step-by-step examples are provided to master this difficult stage.

Chapter 10, *Creating Walk-through Visualizations*, is the final step where final techniques are explained to enhance the quality of an animation and a movie by using not only sound, but also realistic effects.

What you need for this book

Lumion Version 4 is used for all the examples in this book, but you can follow the explanations using the free version or a previous Lumion version. Although Adobe Photoshop is used in some examples, you can use GIMP as an alternative.

Who this book is for

This book is designed for all levels of Lumion users, from beginners to advanced users. You will find useful insights and professional techniques to improve and develop your skills in order to fully control and master Lumion.

However, this book doesn't cover the process of transforming 2D information (CAD plan) into a 3D model.

Conventions

In this book, you will find a number of text styles that distinguish between different kinds of information. Here are some examples of these styles and an explanation of their meaning.

Code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles are shown as follows: "Something like `MyProject_version2` sounds great at the moment we save the project "

New terms and **important words** are shown in bold. Words that you see on the screen, for example, in menus or dialog boxes, appear in the text like this: "For now, we will stick with the **New** tab, because all the other tabs are sort of useless if we don't have any project of our own."

Warnings or important notes appear in a box like this.

Tips and tricks appear like this.

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1
Getting Ready for Lumion 3D

Lumion 3D's main goal is to provide the best solution to produce believable 3D renders in the simplest way possible. Lumion had a modest start with the first version, but from the beginning, it was easy to see Lumion's potential. The final output is simply amazing when compared to the time it takes to create a movie and still image.

Lumion always aimed to bring the best real-time technology and at the same time provide intuitive and friendly software that empower anyone to transform a simple 3D model into a highly professional still image or beautiful architectural movie. The real-time technology used in Lumion 3D allows us to focus on the artistic side of the project instead of the technicalities and parameters.

Consequently, it doesn't matter what your professional background is; you can use Lumion 3D for your projects, and this book is aimed at helping both beginners and advanced users. However, you might wonder how a book can be useful and practical for two totally different types of users. For someone who is just starting out with Lumion, this book covers in depth the tools, techniques, workflow, and other elements that will enable you to become a Lumion master and produce an output similar to this:

On the other hand, if you are an advanced user, this book can help you explore in more depth how to use Lumion in ways you didn't think possible, helping you to see Lumion from a totally different perspective.

In this chapter, we will cover the following topics:

- Controlling the camera
- Lumion's hotkeys
- Using the **Settings** window
- Modeling for Lumion
- Additional models
- Importance of materials
- Solving common problems
- Exporting 3D models
- Using the COLLADA format
- Exporting animations

Starting to work with Lumion

Now, to get ready for Lumion 3D, what we need is a detailed 3D model. Lumion doesn't have any modeling tools; this means we have to pick a modeling package such as SketchUp, 3ds Max, Modo, or Blender, just to mention a few, and use a **computer-aided design** (**CAD**) plan as a reference to model the building. Modeling with one of these packages is out of the book's scope, but if you are modeling for the first time, you might want to explore SketchUp. SketchUp has a free version; it is a very easy application to learn. There are plenty of tutorials to help you start working with SketchUp, and Lumion imports SketchUp files directly, without the need to use any special format.

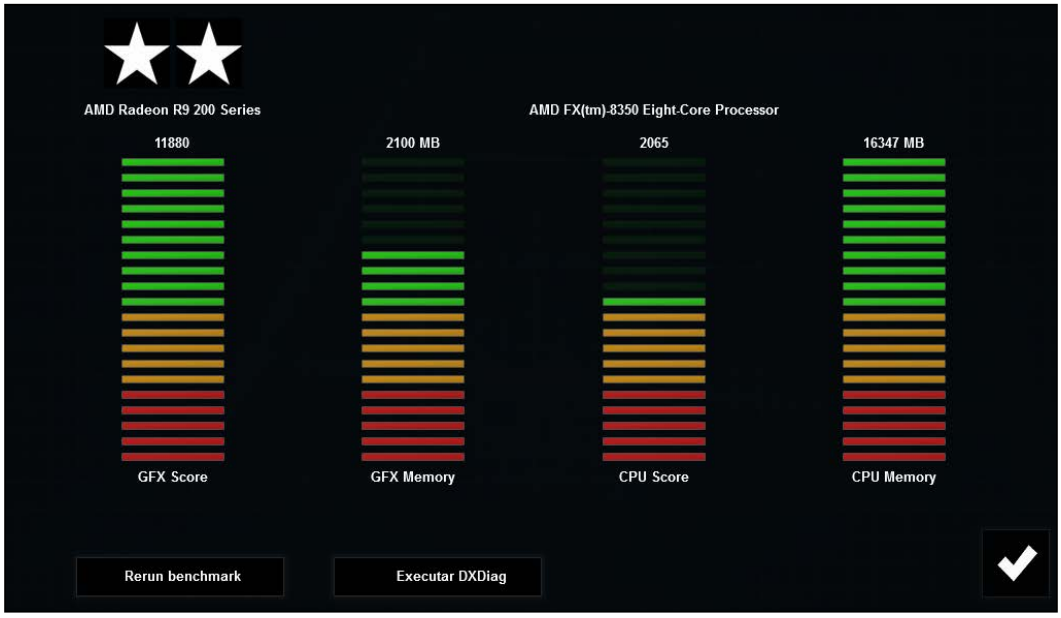
Assuming that we have a 3D model, our next step is to import this model into Lumion and start adding more content by adjusting the weather's elements, sculpting the terrain and then adding some camera effects, and finally, exporting this as an image or a movie. In simple terms, this is more or less the workflow to work with Lumion.

Nevertheless, before starting this process, we still need to be sure that the 3D model is ready to be imported inside Lumion. When you look at the topics mentioned in the beginning of this chapter, they might look simple, but we should fight the temptation to jump to the next chapter. This chapter is the cornerstone of the project we are going to develop in Lumion, and the topics mentioned can serve as a checklist that we can run quickly before importing our 3D model, making sure that we don't need to jump back and forth solving issues.

Let's start with a quick overview of some fundamental concepts that will help you work with Lumion and check whether your 3D model is working properly.

A quick overview

After launching Lumion for the first time, it will run a benchmark to check our system or workstation and see if there is any hardware component that we can upgrade in order to run Lumion more smoothly. The next screenshot shows an example of the final result and the components we might want to upgrade:

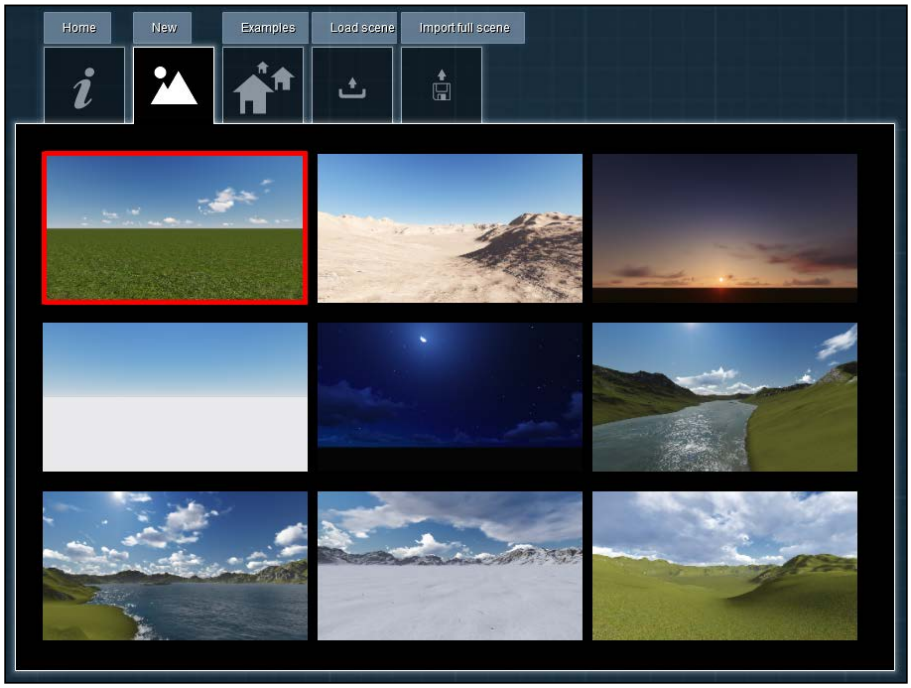


Although **CPU Memory** and **CPU Score** are essential, the most important piece of hardware is the graphics card. Which graphics card we use makes all the difference, and Lumion's official website has some useful information that can help us evaluate the vital role of this piece of hardware.

To find out what hardware will be best suited to work with Lumion 3D, check out the following link:

`http://lumion3d.com/faq/#hardware`

When the benchmark finishes execution, the next interface that appears is what we can call the main menu, although there isn't any official name. We call this area the main menu because here we find the most important settings to start working with Lumion. As you can see in the following screenshot, there are several tabs, and if we click on each one, we would find different areas that help us work with Lumion:

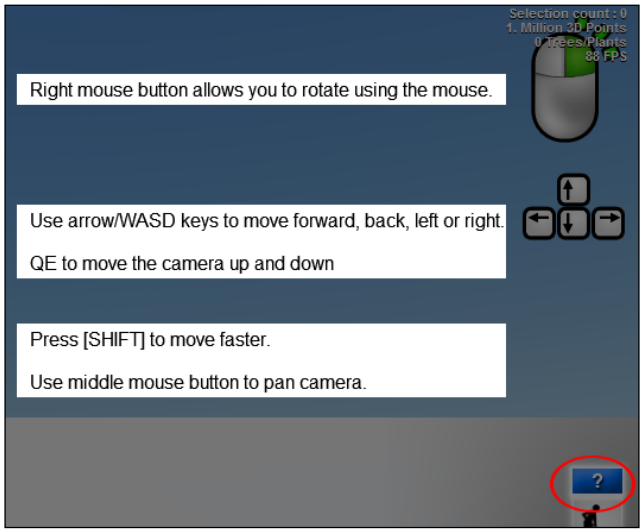


For now, we will stick with the **New** tab, because all the other tabs are sort of useless if we don't have any project of our own. We will look at a new project that is exactly what we can start in the **New** tab. For this, we can use one of the nine scenes shown in the preceding screenshot. However, which one should we select? All the nine scenes can be accomplished by tweaking the menus we find inside the **Build** mode (the **Build** mode is where we can build the project), and therefore, we can say that these nine scenes work as a shortcut or a preset to get a specific look and mood, although later, we can entirely change the look of the environment. Unfortunately, for now, we cannot save an environment created as a template, but nothing stops you from saving a scene and using it as a template. The only difference is that it will not appear in the **New** tab.

A good starting point is to use the **Grass** scene. The **Grass** scene is highlighted in the previous screenshot and is a good starting point because it is a simple scene with a flat terrain and good light. After selecting this scene, Lumion loads the scene and opens the **Build** mode.

Camera navigation in Lumion

Now that we are inside the **Build** mode, how can we control the camera? The **Build** mode has a very simple interface. Initially, we might feel lost with the lack of information in the interface. On the right-hand side, there is a set of buttons, and if we hover the mouse over the one with a question mark, some information appears that will help us. For now, the information we need is the one located in the top-right corner; this tells us how to navigate or control the camera in Lumion, as you can see in the following screenshot:



Here is a list of the keys and combinations to fully master the Lumion navigation system:

- *WSAD* / arrow keys: These are used to move the camera forward, backward, to the left, or to the right, respectively
- *Q* and *E*: These are used to move the camera up and down, respectively
- Spacebar + *WSAD*/arrow keys: These are used to slow down the camera
- *Shift* + *WSAD*/arrow keys: These are used to move the camera fast
- *Shift* + Spacebar + *WSAD* / arrow keys: These are used to move the camera very fast
- Use the right mouse button and move the mouse to look around
- Use the middle mouse button and move the mouse to pan the camera
- Mouse wheel up/down: This is used to zoom in and out the camera
- *Ctrl* + *H*: This is used to reset the camera pitch to horizontal viewpoint
- *O* + the right mouse button: This is used to orbit the camera

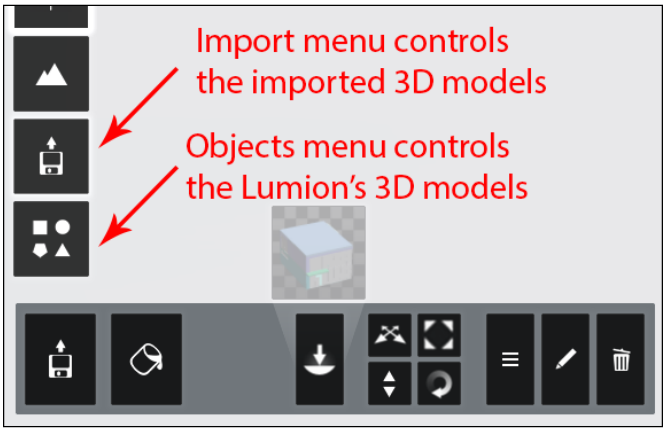
Now that we know what to use to control the camera, another question arises: how do we control the 3D models inside Lumion?

Controlling 3D models

Every time we place a 3D model inside Lumion, it is normal to accept some controls to tweak and adjust some basic parameters such as move, scale, and rotation. Now, it is a good time to introduce a concept that Lumion uses to control the 3D models in the scene.

Handling the 3D models using Lumion

Lumion makes a distinction between the 3D models we import and the native 3D models. This means we need to use two different Lumion menus to control each 3D model, as explained in the following screenshot:



The **Import** menu is where we can find the tools to import external 3D models, and the **Objects** menu is where we can find all the built-in 3D models of Lumion. There are two different menus, two different types of 3D models, and two different ways to select and control. This means that to control an imported 3D model, we need to have the **Import** menu selected; otherwise, we cannot find any tools to adjust the model. The same principle applies, for example, when we need to move a tree, and for this, we need to have the **Objects** menu selected. So, how can we import a 3D model?