Lumion 3D Best Practices

Lumion is a real-time 3D technology that lets you create amazing visualizations without the need for long rendering hours.

Lumion 3D Best Practices covers the most important Lumion features and techniques that can be incorporated into any real production environment. Each chapter covers a different stage of a production workflow. The first two chapters provide a good foundation, in particular for when creating content for Lumion. Furthermore, the book provides an efficient workflow by covering two classic visualization scenes: interior and exterior scenes. You then get to know the best techniques to create physically based materials that boost the look and realism of any 3D scene. Special chapters are reserved to create efficient animations, still images and movies. By the end of this practical guide, users will be familiar with the professional and effective techniques to increase efficiency in producing high-end quality visualizations in Lumion.

Who this book is written for
This book is designed for advanced Lumion users who wish to apply these techniques to their own projects. The reader should be familiar with modeling knowledge and have at least a basic knowledge of a graphics editing program, such as Photoshop or Gimp.

What you will learn from this book
- Tackle the most common issues and develop an effective workflow
- Import detailed and optimized external 3D models
- Construct effective lighting for interior scenes
- Sculpt detailed terrains with heightmaps
- Create PBR materials for realistic renders
- Design complex animations curved paths
- Add extra realism with Lumion’s effects
- Learn to create a still image and a movie

In this package, you will find:

- The author biography
- A preview chapter from the book, Chapter 1 'Getting Ready with Lumion 3D'
- A synopsis of the book’s content
- More information on **Lumion 3D Best Practices**
Ciro Cardoso is an experienced 3D artist and a trained author with an architectural background who started experimenting with creative software and 3D software back in 2000.

In 2005, he was running his own small multimedia business and worked on projects as diverse as graphic designing, CAD services, and architectural visualization; more recently, he started using Lumion successfully for high-end projects in more than six countries. He is quite literate with software in general, with extensive expertise with Maya, 3ds Max, AutoCAD, Photoshop, Lumion, Unreal 4, and Bentley MicroStation.

He is also the author of several books about Lumion and is now working in London.
Preface

Lumion has a strong presence in the visualization field as a useful, practical, and efficient tool to create beautiful architectural visualizations in a quick and efficient way.

The need to write this book started with the necessity to find proficient ways to work with Lumion and to simplify its workflow. If you think about it, there are several stages that we need to go through before we present a Lumion visualization. Each stage presents its unique challenges, in particular, if you are new to the 3D world. As an example, at the importing stage, you don't simply import a 3D model in Lumion. You have to confirm whether the geometry is optimized and that there aren't any overlapping faces and you also need to check whether each surface has a material that can be used in Lumion.

Yes, Lumion is an intuitive tool, but that doesn't mean it will do all the hard work for you. That is why you have this book, which covers the most important stages of Lumion and helps you understand the ways in which you can take full advantage of Lumion's capabilities.

This book doesn't have any examples for you to follow, for just a simple reason; you want a book that is practical and efficient without wasting time following an example that has nothing to do with your project. Certainly, you may want something that you can apply straight away to your project and see first-hand how things really work. For that reason, I encourage you to read this book while working on your projects and then, later, you can use it as a quick reference.

What this book covers

Chapter 1, Getting Ready with Lumion 3D, focuses primarily on the first steps to be taken with Lumion, and this will help you to understand what is available inside Lumion and how to bridge the gap of the lack of models. Two additional topics are covered in this chapter to help you start a project in Lumion on the right foot: the use of layers and how materials are essential while importing a 3D model.
Chapter 2, Importing and Handling 3D Models, will help you to import 3D models from any application and will show you how to tackle specific problems while importing 3D models. You will also learn how to import 3D models and work with large scenes. After importing, the next stage will involve how to place and handle a group of 3D models.

Chapter 3, Creating an Interior Scene with Lumion, covers different techniques to create interior scenes with efficiency and interior scenes. This involves three sections: one that covers 3D models and how you can take full advantage of the Context and the Properties menu, the second that helps us with the materials, and the third to create an interior lighting rig.

Chapter 4, Creating an Exterior Scene with Lumion, will help you to handle the different technical aspects that compose a landscape. A more in-depth look will provide you with the best techniques to create different landscape types. A special section in this chapter is aimed at helping you with the sculpting of the terrain and will show you the different techniques available to modify the terrain.

Chapter 5, Working with Physically Based Materials, provides you with all the help you need to start working with the physically based rendering materials (PBR) that are a fundamental aspect to create believable visualizations. You will learn what makes them so special and also three different techniques to create materials in Lumion.

Chapter 6, Animation Techniques in Lumion, explores how to turn a lifeless 3D world into a vibrant world full of animations and life. Some technical and advanced tools are also covered in this chapter to give you full control over Lumion's camera.

Chapter 7, Producing a Still Image with Lumion, is the first part of two chapters that explains 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, Producing a Movie with Lumion, is the second chapter that gives you additional information about Lumion's effects. This chapter also provides you with information about how to create, organize, and combine small animation clips to create a beautiful movie.

Chapter 9, Exporting and Post Production, has some important information regarding the best ways to optimize your scenes before you export or render them. The two important sections that we've covered here are how to use render passes for an efficient workflow and how to use Lumion Viewer.
What was your initial reaction when you discovered Lumion 3D and what you can do with it? Perhaps, it was an absolute astonishment since Lumion 3D is a remarkable software and at the same time, it is easy to use. Personally, I have been using Lumion since its first version and with each new version, Lumion's team doesn't stop surprising me with new tools and the ability to almost effortlessly produce artistic impressions, believable renders, and incredible videos in a very reasonable amount of time.

However, Lumion 3D has some limitations and is not a magical solution that will automatically create beautiful concepts and illustrations. Some will say that it takes only 15 minutes to make a final product from a 3D model (not including the render time), but the truth is that if you want to create a professional output, there is the need for more time and attention to detail. One way you can optimize the time it takes to go from point A to point B is by improving your workflow and trying some techniques that are used in real projects and that can be easily included in your standard workflow.

This first chapter is designed to cover the most important topics and gives you a solid foundation that will help you start working with Lumion. We will cover the following topics in this chapter:

- What it is possible to do with Lumion
- Where to get a demo version
- What do you need to work with Lumion
- Different Lumion versions
- Using additional models
Getting Ready with Lumion 3D

- Keeping the project organized
- Using Lumion's layers
- The importance of materials
- Quick overview

The first few topics are aimed for those who are new to Lumion or don't know whether Lumion can meet their needs. For them, this initial section will work as an introduction. So, if you have some experience working with Lumion, feel free to jump to the section that most fits your need and before you skip this initial chapter, you may want to explore the last section called *Quick overview of Lumion* to check out the new interface and shortcuts in Lumion.

**An introduction to Lumion for beginners**

Lumion is targeted to produce visualizations and in most commercial projects this implies the use of a great deal of vegetation, a vast diversity of 3D models, a lighting system and materials, just to mention a few of the key aspects. Now, imagine having all of this information in real time. if you were to build a tree, not only will you see the materials, light, and shadows, but you can also move the camera around and see in real time how the tree looks like. As a plus, everything in Lumion is intuitive and user-friendly.

**What is possible with Lumion**

This creative independence and usability doesn't come without a fee because in order to provide this continuous feedback (real time), some corners need to be cut. This in turn affects how light is calculated and how materials are designed and react to light. Also, you need to keep a careful balance between 3D details and the amount of geometry used, as it is obligatory.

Lumion is not an application for producing photo-realistic renders. However, the simplicity and time it takes to have a final product ready to show to the client compensates for this lack of photo-realistic touch. You can see this for yourself at [http://lumion3d.com/showcase/](http://lumion3d.com/showcase/).
So, what exactly is it possible for us to create with Lumion? Are we doomed to a low-quality product just because of some real-time technicalities? Let's have a look at the following render:

This image is a render taken from an example available in Lumion 5 and, hopefully, this can give you a good idea of not only Lumion's quality, but also the complexity that can be achieved in each scene. One thing that stands out in this render is the amount of 3D objects in the scene and you can take into consideration that individual trees along with the grass add loads of polygons to the scene. The truth is that Lumion can literally handle millions of polygons and this is useful not only for forest scenes such as the one we saw previously, but also for urban environments where we need a vast array of 3D models. Another key aspect that can be mentioned is the amount of 3D models available with Lumion (in particular, trees and plants), volumetric light, and mass placement that add life to a city scene with just a few clicks.

However, how do you know if Lumion is what you need for your company or for you pallet of tools?
Where to get a demo version, and some limitations of Lumion

Certainly, you are interested in trying Lumion to see whether it fits your needs, and the best solution to this is to try Lumion's free version. Great! A free version of Lumion! Nevertheless, I must warn you that although it's "free", this version is very and I repeat, very limited. You can use it to see how to import 3D models, check the 3D model's quality, and see how the material system work, but you will not have access to the most important and new features.

You can request for the free Lumion version at http://lumion3d.com/free/.

This demo version can help you check whether the workstation or computer can run Lumion and meet the minimum requirements. After launching Lumion for the first time, a benchmark is used to check your workstation to check whether there is a necessity to upgrade a hardware component in order to run Lumion more smoothly. To work with Lumion, you need a powerful workstation and in particular, a good graphic card which is the key hardware component in this equation. Have a look at the following requirements taken from Lumion's website.

The recommended system specifications are:

- A 64-bit Windows Vista, Windows 7 or Windows 8 OS
- 8GB RAM
- NVidia GTX 680 / AMD Radeon HD 7970 or a faster version graphic card with at least 2GB dedicated memory
- 7.5GB of free disk space

Does this mean you are doomed if you don't meet all the requirements? Not exactly! You may struggle to work with some scenes, but you can lower the viewport's quality, which in turn gives you more room to work. You can also make good use of the layers to hide some models of the scene, which in turn leaves more resources available for you. Nevertheless, it is when you render the scene that you may feel the biggest impact of not meeting all the requirements. A scene that could be rendered in 30 minutes with a good graphic card can take you a couple of hours with a lower-range graphic card. However, there are a few more things you should know about to have the full picture of what is involved when working with Lumion.
To find out which hardware will be best suited to working with Lumion, check out http://lumion3d.com/faq/#hardware.

What is necessary to work with Lumion
An additional aspect you need to know is that Lumion wasn't designed with modeling and texturing in mind. Therefore, it is your responsibility to have a detailed 3D model and extra models if you don't like Lumion's optimized models. This means that all the modeling and texturing work needs to be done using an external software. If you are looking for something free, SketchUp is the best solution. Although, you can use Blender, which is a more complex and complete solution.


On the other hand, if you like to know more about Blender, visit http://www.blender.org/download/.
You can learn more about it at http://www.blender.org/support/tutorials/.

What about other applications? Well, you need to export the 3D models into a format that Lumion can read and import. To give you an idea of what Lumion supports, have a look at the following list:

- Autodesk RealDWG: *.dxf
- Autodesk RealDWG: *.dwg
- COLLADA: *.dae
- FBX: *.fbx
- 3ds Max: *.max
- 3ds: *.3ds
- Obj: *.obj
- SketchUp: *.skp
- KMZ: *.kmz
Getting Ready with Lumion 3D

Don't panic if you don't see your favorite application listed here, because it doesn't mean that Lumion is out of question. Most 3D applications can export the 3D model using the FBX or COLLADA file format. For example, I often use Revit for some projects and Lumion's team was kind enough to provide a free export for all users not only for Revit, but also for ArchiCAD.

If you are using Revit, have a look at http://lumion3d.com/revit-to-lumion-bridge/.

If you are using ArchiCAD, you can visit http://lumion3d.com/archicad-tolumion-bridge/.

There are a few more things you need to know before jumping to Lumion's introduction.

Different Lumion versions
Lumion is available in 4 versions. We already saw that there is a free version of Lumion with loads of limitations and that the only purpose is to test some of the Lumion's features. You also have an educational version and the paid versions: Lumion Pro and Lumion.

What is the difference between these two versions? To answer that have a look at the following list:

• Output to real-time fly-through via Lumion Viewer
• Output of background music/sound in MP4
• Project files functionalities
• Content available

From all the points listed, the one that will have the biggest impact is the lack of content. Lumion only has a third of what is available in Lumion Pro and for someone who started working with Lumion, this could be a problem.

Do have a look at the full description of the differences between Lumion versions at http://lumion3d.com/products/.

The good thing with the models that are bundled with Lumion is the fact that these 3D models are optimized to have quality and at the same time, are not too heavy in terms of geometry (which in turn makes your viewport slow). However, there is one way you can tackle this issue if you choose the standard Lumion version.
Using additional models

If you opt for the simpler Lumion version, the lack of content doesn’t mean your project has to be empty and will lack diversity. You just need to start building your own library and if necessary, optimize the 3D model.

Where can we find good 3D models? The following is a list of some places where you can find free and paid models:

- **Creative Crash**: This model is available at [http://www.creativecrash.com/marketplace/3d-models](http://www.creativecrash.com/marketplace/3d-models)
- **Archive 3D**: This can be downloaded from [www.archive3d.net](http://www.archive3d.net)
- **Mr Cad**: This can be obtained from [www.mr-cad.com](http://www.mr-cad.com)
- **3Delicious**: This is available at [www.3delicious.net](http://www.3delicious.net)
- **TurboSquid**: This can be found at [www.turbosquid.com](http://www.turbosquid.com)
- **Resources Blogscopia**: This can be downloaded from [www.resources.blogscopia.com](http://www.resources.blogscopia.com)
- **SketchUp Warehouse**: This can be downloaded from [http://sketchup.google.com/3dwarehouse/?hl=en](http://sketchup.google.com/3dwarehouse/?hl=en)
- **Evermotion**: This is available at [http://www.evermotion.org/modelshop](http://www.evermotion.org/modelshop)

As was mentioned before, some of these models will need to be cleaned and optimized in order to have a balance between detail and geometry. How can we do this you ask? One way is to manually clean the geometry, which can be very tedious and time-consuming. On the other hand, you could use Simplygon. They have a free version that will give you enough room to start cleaning geometry.

Simplygon automatically reduces the polygon count of 3D meshes primarily to create optimized models for visualization. For more information, refer to [https://www.simplygon.com/architecture-infrastructure](https://www.simplygon.com/architecture-infrastructure).

After this quick introduction to what is involved in working with Lumion, we can start and prepare ourselves to launch Lumion. However, the preparation starts before we even launch Lumion. How?

Keep your project organized!

From the CAD plans to the final image or animation clip, there is a lot of information that needs to be stored in an orderly way. You may prefer to work in a chaotic way, but it pays to be organized when using Lumion because similar to most applications, it uses links to files in order to work.
Lumion is not like 3ds Max or Maya where when you create a project, it automatically creates the list of folders to keep everything organized. This means that you will need to create some of these folders and keep the files inside those folders; otherwise, you could face some problems down the line. What would I recommend, you ask? Have a look at how the folders are organized in the following figure:

This is just an example of a way to organize the folders, but the significant bit is to keep it consistent. If you export the 3D model to a folder and save the textures in the same folder, this will prove useful later if there is a need to reload or reimport the 3D models.

There is an additional action you can take to keep your project organized and consequently, create a smooth workflow.

**Using Lumion's layers**

The layer's menu in Lumion is the simplest menu we can use but, initially, it may not be that easy to find. Firstly, it only appears when we have the **Import** and **Objects** menu selected and secondly, it is not that obvious as to where it is located. Do you see the black box with a number on the top left-hand side of Lumion's interface? That is the indication where the layers are, and once you move the mouse over this black box, the following options appear, as shown in the next screenshot:
The workflow for using layers in Lumion is as follows:

1. Select the layer by pressing the number and if necessary, rename the layer.
2. Then, place the 3D model(s) on the scene, so that the model is placed inside the selected layer.

What happens if you add a model to a wrong layer? Nothing simpler than following the next steps:

1. Select the 3D model(s). The easiest way to do this is to hold the Ctrl key and then click on and drag with the left mouse button to draw a selection rectangle around the 3D model(s). An alternative way to do this is to hold the Ctrl key and then click on each 3D model's pivot.
2. With the 3D model(s) selected, chose the correct layer and click on the Move selection to the layer button, as shown in the following image:

Make a good habit and practice in the way you use layers throughout the project. This not only makes your project more organized, but will also dramatically improve the speed of Lumion's viewport. How does it work? Well, every 3D model added to the scene means that Lumion needs to render that information in real time and that will decrease the speed of Lumion's viewport, which is measured in frames per second. The more frames per second (FPS) the more fluid working in Lumion will be, and you can see that information at the top-right corner of Lumion's interface.
So, how can the layers help us with this? During the process of building the 3D world in Lumion, we don't need to have all the 3D models on screen and in some situations, it is even better if we don't have them exposed. By using the layers to hide these 3D models, we not only reduce some visual noise, but we hide geometry, and hiding geometry means that Lumion has more resources available, which in turn makes the viewport much smoother.

One last thing that you need to understand before we start working with Lumion is why we need to use different materials on your models.

**The importance of materials**

This is something fundamental that needs to be done in order to work with Lumion. In simple terms, Lumion does not recognize your geometry, but instead recognizes the materials assigned to each surface or face. To help you understand, let's have a look at the following image:

In the previous image, we have a 3D model that only has one material which, in this case, is the default material used by 3ds Max. So far so good, but watch what happens when we import the same model in Lumion and try to add a Lumion material. The image at the bottom-right corner shows the result of using only one material for the entire model—Lumion only recognizes "one big surface".
For that reason, you need to think ahead and identify which areas of your model need a specific material and you need to assign a different material for each section. As you can see in the following screenshot, it doesn't need to be something too fancy:

In this case, a simple colored material was applied to the different sections. For example, for the windows, we used a blue material; for the walls, a green material; and so on.

With all of these things in mind, you are now ready for a quick overview of Lumion and are ready to find out how it works. It is a crash course in two pages, but it will provide you with all you need to know to follow the rest of the book.

**A quick overview of Lumion**

As mentioned before, when you launch Lumion for the very first time, a benchmark starts to evaluate your workstation. After that comes the Files menu that is composed of five tabs—**New**, **Examples**, **Load scene**, **Save scene** (this tab only appears after you open a scene), and **Import full scene**.

The **New** tab is where you start a new project and here you can find nine different scenes to help you start working with Lumion. Keep in mind that the difference between each scene is the settings used for landscaping, weather, and lighting, which means that you can pick any scene available and then create the other eight scenes easily. Let's click on the **White** scene to start working with Lumion and explore the interface to see where we can find the main menus.
Exploring the interface and controlling the camera

Lumion tries to provide you with a friendly user interface and, initially, this may be confusing because you almost have no visual information and don't know where to find the menus. Lumion has four main menus that you can find on the left-hand side of the screen and when Lumion opens a new scene, the Import menu is the one that is opened by default. The other three menus only appear when you move the mouse close to the Import menu icon that you see on the screen. The following image shows you the toolbars that appear when you open each menu:

![Toolbars](image)

The next section that is essential is located on the right-hand side of the screen and here, you can see some small icons that give you access to different menus, as you can see in the following screenshot:

![Icons](image)
What essential information is missing here? How do you control the viewport and the camera? The easiest way to learn this is by having a look at the following screenshot:

This information is available when you work with Lumion; you just need to hover your mouse over the Help button and all of these tips will appear. However, there are some shortcuts you can use to control the camera, which are as follows:

- Double-click with the right mouse button to zoom in
- Use the middle mouse button and move the mouse to pan the camera
- Scroll the wheel mouse up/down to zoom in and out of the camera
- Ctrl + H is used to reset the camera pitch to a horizontal viewpoint
- O + the right mouse button is used to orbit the camera

All of these shortcuts and keys that are used to control the viewport while working in Lumion will be used later to control and tweak the cameras used for the animation clip and to render images.
Summary
This first chapter was quick but essential introduction to Lumion. You saw what it is that we can do with Lumion regarding quality and also saw the complexity of the scenes you can create by adding literally millions of geometrical shapes. You learned that although a Lumion standard version doesn't provide the myriad of 3D models than Lumion Pro has, there are many places where you can find good quality models that will need some geometry cleaning, which don't compromise Lumion's speed.

The final section of the chapter was dedicated to the topic of how to start working with Lumion, starting with the right foot forward by keeping the project organized using Lumion's layers, and finally, we identified the need to use different materials when modeling. Now, after the crash course on how to start working with Lumion, you are ready for the next chapter.

The next chapter will help you with the next stage of the workflow: importing and controlling models. This may look straightforward, but can present some challenges that require the best practices to keep a smooth workflow.
Where to buy this book

You can buy Lumion 3D Best Practices from the Packt Publishing website.

Alternatively, you can buy the book from Amazon, BN.com, Computer Manuals and most internet book retailers.

Click here for ordering and shipping details.