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# MASTERING **UNREAL**<sup>®</sup> TECHNOLOGY

VOLUME II:

Advanced Level Design  
Concepts with Unreal<sup>®</sup> Engine 3

JASON BUSBY / ZAK PARRISH / JEFF WILSON



## **Mastering Unreal® Technology, Volume II**

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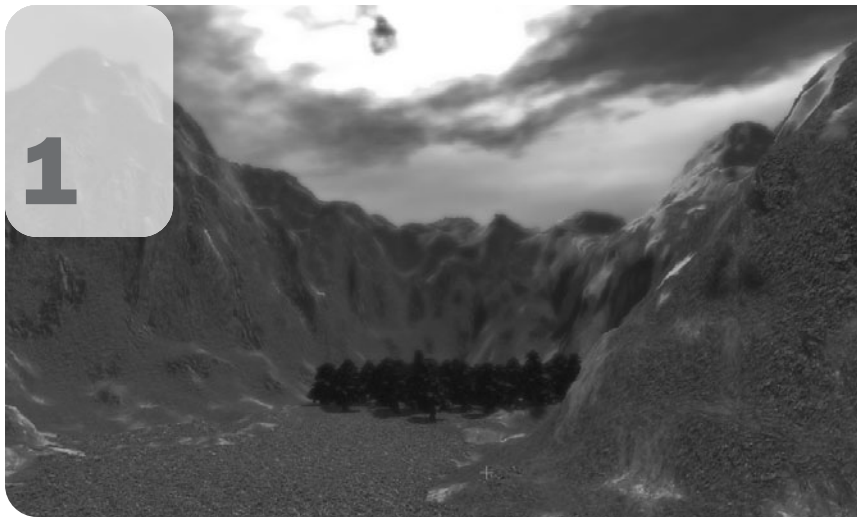
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# Chapter 1



## Introduction to Advanced Level Design

Welcome to advanced level design in Unreal Engine 3! Whether you've read our previous two volumes, created your own games and levels, or just played games built with Unreal Engine 3, you probably realize just how powerful this game engine can be. You've seen Unreal Engine 3 create vast worlds with lush environments that stagger the senses of your players. You already have some idea of the power the Unreal Editor gives to game artists.

Now, it's time to kick things up a notch. Heck, *more than a notch*: It's time to take Unreal Engine 3 to the limits, and make your gaming experiences even more stunningly believable.

If you want to shake your players to the very core, you're gonna have to master the heavy-duty stuff: particle systems, custom animations, physically reactive dynamic objects, advanced materials, and more. All that stuff's built into Unreal Engine 3—and we're going to show you how to use it. Not just a little: *to the fullest*.

## Who Is This Book For?

A little housekeeping first. (Just a little.) As you've probably figured out by now, this isn't intended as a beginner's book.

Now, if you're a beginner or have only limited experience, let's be clear: We are *not* blowing you off. Quick learners should be able to follow along: just go slow, and take it a bit at a time. The tutorials are written in an easy-to-follow, step-by-step manner that should allow users of just about any experience level to participate—and we know, because we've been training Unreal developers for years.

But if you're already comfortable with the Unreal Editor, and you've done basic Unreal programming, you'll definitely be able to move faster.

## What Should You Know Before You Start?

This book is intended to be used with the game *Unreal Tournament 3*.

Many of the basic concepts we teach you apply to other Unreal Engine 3–based games that provide access to the Unreal Editor. However, many of our tutorials rely on game assets that come with *Unreal Tournament 3*. What's more, other games sometimes change the engine and the editor, which could make them work differently—or at least confuse the heck out of you. We wouldn't want that!

As we've already said, we do some handholding throughout the tutorials, but you'll be better off if you're at least basically familiar with the Unreal Editor's key concepts and controls. Ideally, it'd be way cool if you've already explored:

- Navigating perspective and orthogonal viewports
- Creating additive environments using BSP brushes
- Navigating and creating assets within the Generic browser
- Loading and unloading asset packages within the Generic browser
- Placing objects into levels from the Generic and Actor Classes browsers
- Adjusting actor properties within the Actor Properties window
- Setting up basic Kismet sequences
- Creating basic materials with the Material Editor
- Simple keyframe animation using Matinee

Haven't done all that? As someone once said, *don't panic*. As we keep saying, you'll still be able to follow along, just more slowly. But you'll definitely have a smoother, faster learning experience if

you're already familiar with Unreal Engine 3 and the Unreal Editor. To that end, you might want to check out the following training resources:

- ***Mastering Unreal Technology, Volume I: Introduction to Level Design with Unreal Engine 3***—The first volume in this series, this book gets you up-and-running with the Unreal Editor. It's specially designed for anyone just getting their feet wet with Unreal Engine 3 modding.
- ***Unreal Tournament 3: Collector's Edition***—The Collector's Edition version of *Unreal Tournament 3* includes a separate DVD that contains many hours of Unreal Editor training—including several videos geared specifically for beginners.
- **www.3dbuzz.com**—That's us! 3D Buzz, our company, delivers hours of professional-quality video training content covering Unreal Technology, programming, 3D graphics, and more! Get started right away by watching our Video Training Modules, or dig through our forums for tons of valuable information. And, since this site's staffed and run by this book's authors, it's a great way to get in touch with us. (Come, say hello—really!)

## What We Mean By “Advanced” Level Design

The Unreal Editor brings together a vast toolset and immense power. Some of its tools are simple, straightforward, and haven't changed much over the years. Others have changed dramatically in Unreal Engine 3, offering far more power and flexibility than ever before. And some are brand-new to game editing: They bring elements of high-end film and special effects production into gaming for the first time.

In this book, we focus primarily on the tools that are either new or dramatically improved in Unreal Engine 3. But we also show you breakthrough techniques for making the most of commonly used tools like the Material Editor, so you can create more powerful assets than 99% of the people who are using it right now. (Hey, it's a competitive world. These days, average just won't cut it anymore!)

## Included Assets and Game Assets

Beyond your sparkling personality, you need plenty of other assets to complete the tutorials in this book. Textures. Sounds. Images. Stuff like that.

Fortunately, you'll find many of those assets on the DVD we've bound into the back of the book. There's a folder for each chapter that requires these assets.

The other assets you need are installed with the *Unreal Tournament 3* game. You'll find them within packages (UPK files). After a default installation, you'll find those packages in the following installation folder:

```
C:\Program Files\UT3\UTGame\CookedPC
```

If you've installed to a different drive or folder, your path will start out differently, but once you drill down to the UT3 folder, everything underneath it should follow the same folder structure.

Within the CookedPC folder, you'll see several subfolders, each containing several packages. The subfolders you care about most are:

- **Environments**—Here are the assets used to build the levels that shipped with *Unreal Tournament 3*, such as static meshes, textures, and materials. These packages are organized into themes, which makes it easier to find the assets you need, based on what you're trying to create.
- **Characters**—Need a UT3 character for a cinematic sequence? They're here, and each type of character is itself divided into various packages.
- **Maps**—Need to change an existing map? Want to see how an effect was created in one of *Unreal Tournament 3*'s built-in maps? Those maps are here.
- **Effects**—Here are the packages you need to create particle effects (explosions, fire, and so on), lens flares, vehicle and weapon effects, and other special effects.

#### NOTE

Keeping things simple for you isn't the only reason for Unreal's folder and package structure. There's an equally important reason: memory usage. When you load a package, its contents are all placed in memory. Since you don't have infinite memory, you don't want to load more packages than necessary. The folder and package structure helps you load only what you need right now. (How many packages is too many? That depends on your system's specs. But if you're noticing a slowdown or occasional instability, you just might have too many packages in memory. Unload a few!)

## Working with INI Files

A few of our tutorials require you to alter an *Unreal Tournament 3* INI file in order to see the result in-game. When this happens, we tell you exactly which files to alter and how to do it.

These INI files can be found within your local Documents folder. If you've performed the default *Unreal Tournament 3* installation on a Windows system, that'll be here:

```
Documents\My Games\Unreal Tournament 3\UTGame\Config\
```

Unlike, say, Registry entries, INI file changes are dead simple to remove. Just delete your altered INI file. Next time you launch *Unreal Tournament 3* or the Unreal Editor, it'll create a new, replacement INI file using the default settings.

By the way, when you create a full modification for *Unreal Tournament 3*, players can include INI files that pertain only to their mod, so other gamers can view their creations.

## Future Software Changes

Finally, if we had lawyers, they'd probably tell us to say this: We've done our best to make sure this book's tutorials and concepts are up to date and accurate at the time we wrote them. They reflect everything we know about writing accurate, reliable Unreal code. We've been darned careful. But we can't predict the future. (Find someone who can, and we'll hire them ASAP!) Bottom line: If someday, some patch or software update changes the way these tutorials behave, hey, that's out of our hands.

With that, let's say goodbye to the lawyers, and get down to work.

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