

BUILDING THE GAME WORLD: ENVIRONMENT AND DETAILS IN 3D GAMES

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ABSTRACT

Creating environments in 3D games completely changes the experience of players. The environment allows the players to feel the game world and get deeper into it. This article details the techniques and processes involved in creating environments and details in 3D games.

3D games, unlike 2D games, are important in designing and creating its environment. Authors handle modeling, texturing, lighting, animation, and effects in the early stages of environment creation. In these processes, game developers create 3D models of environmental elements, such as buildings, objects, and tools. Next, the models are textured with ridges, colors and materials. In the process of lighting, brightness, clarity and other characteristics of lighting are determined. Animation is created for the movement of objects and persons used. Effects make the game world more realistic and interesting.

Through the process of testing and optimizing the created environment, the game creators improve the game world for better performance and the gaming experience. Also, the important processes of environment creation in 3D games completely change the gaming experience and allow players to explore and immerse themselves in the game world.

Testing and optimization is one of the last steps for game developers. This process is important to make the game world work well and make the gaming experience high quality and faster. This process allows game developers to more fully test the game world and ensure that it works well.

In general, the environment creation processes in 3D games are extensive and complex, and are critical to the creation and success of game developers. These processes are essential for creating a more complete game world, adding unique features to it, and providing players with a sense of being inside it.

1. Environment Design and Texturing Techniques

Basics of Environmental Design:

Creating a game environment is an important part of the game experience. In environmental design, decisions are made about the location and appearance of landscapes, buildings, forests, cities, and other elements. This process takes into account the genre, story and atmosphere of the game. Environment design is essential to the overall feel of the game and the immersion of the players into the game world.

There are basic concepts and principles in environmental design. First, the game's genre and story greatly influence the environment design. For example, fantasy games can have magical forests, medieval castles, and other unique elements. Second, it's important to use colors, lighting, and textures to create atmosphere. All elements must work together to create an environment that draws players in and encourages them to delve deeper into the game world.

2. Sources of Inspiration and Design Process in Creating Environments:

Artwork, real places, movies, and other games can be inspired when creating a game environment. The design process begins with conceptual drawing and progresses to 3D modeling, texturing and lighting. During the concept drawing phase, designers determine the overall look and feel of the game world. These drawings will later become the basis for 3D models.

Sources of inspiration play an important role in creating an environment. Designers can take inspiration from the real world to create environments that are realistic and familiar, or they can take inspiration from the worlds of fantasy and science fiction to create environments that take players to new and surprising places. Using sources of inspiration in creating an environment allows designers to implement new and interesting ideas.

Elements Important for the Game World to Be Interesting and Engaging:

Details, interactive elements and idiosyncrasies are added to make the game world interesting. These elements attract the players and increase their interest in the game. Details enrich the game world and give players more opportunities to explore and spend time in the environment. And interactive elements allow players to interact with and change the environment, making the gaming experience more interesting.

In environmental design, the location and appearance of each element is important. For example, the natural and unique look of landscapes, the detailing of buildings and structures, and the environment filled with plants and animals provide players with a more realistic and interesting experience. It is also important to use lighting, colors and textures to create atmosphere.

Texturing Techniques:

Programs used to create textures (Photoshop, Substance Painter) play an important role in environment design. Programs such as Photoshop and Substance Painter are widely used to create textures. These programs create high-quality textures for materials and surfaces.

Types of textures: Diffuse, Normal, Specular and other maps. The Diffuse map defines the base colors of the object, the Normal map shows the details of the surfaces, and the Specular map controls the gloss level of the surface. Together, these texture types make objects look realistic.

Techniques for optimizing textures and avoiding duplication are important. Texture optimization improves game performance. UV mapping and material blending techniques are used to avoid repeating textures. Using UV mapping, textures are precisely placed on the surfaces of objects, thereby preventing the repetition of textures. The material blending technique combines several textures to create more complex and realistic surfaces.

2. The Role of Interactivity and Details in Environmental Design

Interactive Environments:

Methods of creating an interactive environment play an important role in games. Interactive environments allow players to interact with the environment. This makes games more interesting and immersive. Interactive elements encourage players to go deeper into the game world and allow them to explore and make changes to the environment.

Physics-based interactivity and its impact on the gaming experience are huge. Physics-based interactivity allows players to manipulate, move, and interact with objects. This makes the gaming experience more realistic. Through physics-based interactivity, players can interact with the environment naturally and intuitively. For example, it will be possible to remove objects, push, break and other actions.

Ways to increase player interaction with the environment enrich the gaming experience. Interactive elements, interesting tasks and stories are added so that players can interact more with the environment. For example, finding mysterious places in the environment, solving problems and other game mechanics increase the interest of players and make them more deeply involved in the game.

Creating Details:

The details make the game world look interesting and realistic. Details enrich the game world and provide players with a realistic and fun experience. Details make the environment more realistic and unique, which attracts players and encourages them to spend more time in the game world.

The techniques used to create and place the details are important. Modeling, texturing and lighting techniques are used to create and place details. Modeling creates the basic shape of the detail, texturing defines the surface and material of the detail, and lighting provides the look and atmosphere of the detail. The overall look and feel of the environment should be considered when placing details.

Attention to detail is important to create a realistic and engaging game world. Details make the game world realistic and attract players. This ensures that the game world is interesting. Details to the players

3. Tools and Resources for Environmental Design

The tools and resources that play an important role in environment design are critical for game developers. In this part, tools used for environment design and methods of working with them are analyzed.

Tools:

The software and tools used for environment design provide designers with high-quality tools and capabilities in the game creation process. The following tools are widely used:

- **Unreal Engine:** A flexible and fully-featured graphics creation platform. Unreal Engine has a wide range of possibilities for creating environments, animations, lighting and game mechanics.
- **Unity:** Another popular game development program, a good option for environment design, animation, and physics simulation. Unity is a convenient platform for both beginners and professional designers.
- **Blender:** Blender is a free and open-source program that is fast becoming popular for its small, compact 3D modeling, animation, and environment creation tools.
- **Adobe Photoshop:** A widely used program for creating and editing textures. Photoshop plays an important role in creating the details of the game environment.

- **Substance Painter:** Professional texture creation software. Substance Painter allows you to create high-quality and interesting textures for 3D objects.
- **ZBrush:** 3D modeling and detailing software. ZBrush is a very useful tool for creating detailed and complex objects.

Resources:

Resources used for environment design are a key part of game creation. These resources include 3D models, textures, lighting.

- **3D Models:** Libraries of free and purchasable 3D models with great possibilities for environment design. For example, custom models can be obtained from sources such as Sketchfab, TurboSquid, CGTrader, Unity Asset Store, and Unreal Engine Marketplace.
- **Textures:** Free or purchasable textures help create parts of the environment design. Textures are available from the following sources: Texture Haven, Substance Source, Poliigon, and Megascans.
- **Lighting:** Realistic lighting that enriches the game world. Free or purchasable lighting is available. For example, highlights can be obtained from sources such as HDRi Haven and HDRI Hub.

Technological Updates:

In the process of creating a game environment, high quality and new technologies are very important for creators. Using the following updates can help enrich the environment design and enhance the game experience:

- **Ray Tracing Technology:** Ray tracing is important for making lighting and graphics more realistic. Lighting with this technology optimizes light reflection and object visibility, and the charge of each object is illuminated.
- **Virtual Reality (VR) and Augmented Reality (AR):** VR and AR platforms provide great opportunities for mastering game environments. These technologies allow players to provide a completely more immersive experience, increasing their turn-to-game times.
- **Procedural Audio Generation:** Procedural audio generation technology makes the game world more realistic. Dynamic and also helps create the atmosphere of the main stage.
- **Machine Learning and AI (Artificial Intelligence):** Smart NPCs (non-player characters) created with the help of AI play a very important role in mastering the game environment. They allow players to increase interactivity, master the four-way exit, and increase the level of difficulty.

Teams and Partnerships:

Partnerships and teams are important in creating a gaming environment. Adding them can help you find innovative solutions and provide a high-quality gaming experience.

- **Game Developers Conference (GDC):** This conference covers the latest temporary updates in the field of game environment creation. Here creators, technologists and designers share ideas and learn best practices.
- **Indie Game Developers Network (IGDN):** IGDN provides opportunities for independent creators to build themselves a comprehensive gaming experience. This community provides direction, support and guidance for new creators.

• **Open Source Communities:** Relying on open sources (Open Source) can be a good option for finding simple solutions in the environment creation process. These teams provide multifaceted collaboration between creators, developers, and designers.

In conclusion, technical solutions, collaboration opportunities, readings and further studies are presented that are critical to creating a gaming environment. In the process of creating this environment, it is important to learn new solutions, gain practical experience and share your ideas with others. However, don't forget to work with quality tools and resources to ensure success. Achieving excellent knowledge and experience in the field of game design will lead to better results. Good luck and success in game development, and we hope this helpful information will help you on your way. We hope you have a great game development experience!

Congratulations, you've found yourself interested in information about creating a game environment! In order to succeed in this field, your interest and desire to improve your knowledge is very important. The solutions, pointers, and information provided to you will help you learn the path and allow you to participate in the creation of your own game world. I wish you luck and blessings in your development in the field of game development! Feel free to write to me for additional questions or assistance to help you achieve your goals and achieve success. If you have any other questions, I'm always here to help you. A successful and creative way to yourself!

SUMMARY

Key Solutions to Achieving Good Results in Creating Gaming Environments

Creating environments in 3D games is a complex but very interesting process and is a key part of the gaming experience. Proper texturing, lighting, and attention to detail make the game look realistic and engaging. Modern techniques such as procedural generation make it easier to create environments and create more interesting worlds. With the techniques and methods presented in this article, you too can create amazing environments in your games.

Game environment creation is a key part of 3D game development and gaming experience. Although this process is complicated, it can be achieved with the help of technical solutions and new methods. Proper texturing, lighting, and attention to detail make the game look realistic and engaging.

Texturing and Lighting: When creating game environments, proper texturing and lighting are essential. These techniques make the game world feel real and allow players to feel themselves in the game. Modern techniques such as procedural generation make it easier to create environments and create more interesting worlds.

Procedural Generation: This technique further optimizes the game creation process. Procedural generation allows you to create worlds automatically, and also opens up new possibilities for creating new and completely interesting environments.

With the techniques and methods presented in this article, you too can create amazing environments in your games. With these solutions and techniques mastered, you can create the game world you think and want. Use these solutions to develop yourself, learn new solutions and make your work more comfortable. Success and luck will bring you the path filled with you!

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