

# Dream Bunny Wonderland

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**Abstract.** The player takes on the role of an adventurer who hears about an island inhabited by numerous rabbits, which eventually develops into the Dream Bunny Wonderland. Fascinated by the stories, the adventurous player decides to explore it. The team uses VR technology to enhance the gaming experience, immersing players completely. This allows them to view game buildings and facilities up close and interact with them. This project uses Unity as the primary development tool, presenting the game in a first-person perspective through virtual reality devices. Using next-generation processes and PBR materials to create models, we aim to build an environment that is both thrilling and charming.

**Keywords:** VR, Game Design, Third Keyword.

## 1 Introduction

VR (Virtual Reality) is a simulated environment created using computer technology, allowing users to experience a sense of immersion. This technology typically employs specialized head-mounted displays (VR headsets) to provide stereoscopic visuals and surround sound, making users feel as if they are in a virtual world.

### 1.1 Key Points of Designing

When designing VR games, several key aspects should be taken into consideration to ensure immersion, usability, and player comfort.

**User Experience (UX):** First and foremost, comfort is crucial. To minimize VR motion sickness, designers should use teleportation instead of smooth movement, as well as gradual acceleration and deceleration.

**Controls and Interaction:** Providing immediate visual, auditory, and haptic feedback ensures that players feel the impact of their actions within the game world.

**Game Design:** Offering multiple difficulty levels caters to players of varying skill levels, ensuring that everyone can enjoy the game regardless of their experience.

**Technical Considerations:** Performance optimization is essential to ensure the game runs smoothly on target devices, avoiding lag and stuttering. Compatibility with

different VR hardware is also important to ensure the game can be played on various VR devices.

**Art and Design:** Ensuring that character movements and physics effects are realistic also contributes to the overall sense of reality within the game.

## 2 The Development Architecture of a VR Game

### 2.1 The Development Layers

The development architecture of a VR game involves several critical layers to ensure a seamless, immersive experience for players. These layers include hardware, software, user interface, content creation, performance optimization (see [錯誤! 找不到參照來源](#) ).

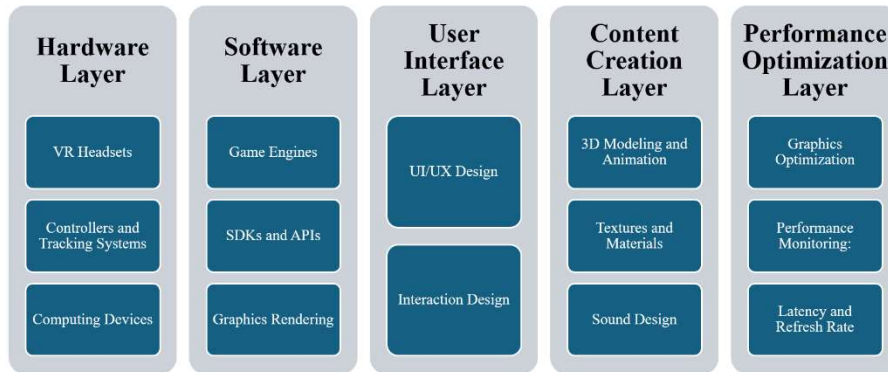


Fig. 1. The layer of the development architecture.

The hardware layer is foundational, involving VR headsets like Oculus Rift, HTC Vive, and PlayStation VR, which provide display and head tracking capabilities. Controllers and tracking systems, such as hand-held controllers and full-body tracking systems, capture player movements and gestures. These devices connect to powerful PCs, gaming consoles, or mobile devices that run the VR game and handle complex graphical computations.

At the software layer, game engines such as Unity and Unreal Engine are essential tools that provide the necessary features for developing VR games. SDKs and APIs, including Oculus SDK, SteamVR, and OpenXR, offer interfaces for interacting with VR hardware. This layer also includes real-time graphics rendering, lighting, shadows, and special effects to create realistic visual experiences.

The user interface layer focuses on UI/UX design, ensuring that interfaces are intuitive and easy to use, allowing players to operate and navigate the game effortlessly. Interaction design encompasses gesture control, gaze control, and voice control, providing natural and immersive interaction methods.

Content creation involves 3D modeling and animation, using tools like Maya, Blender, and 3Ds Max to create game characters, scenes, and objects. Textures and

materials are crafted using tools such as Substance Painter to achieve realistic effects. Sound design is also a crucial part of this layer, adding immersive sound effects, background music, and voiceovers.

Performance optimization is vital for a smooth VR experience. This involves optimizing graphics by reducing polygons, compressing textures, and fine-tuning lighting and shadows. Performance monitoring tools like Unity Profiler and Unreal Insights help track and analyze the game's performance. Ensuring low latency and high refresh rates is essential to prevent motion sickness and maintain immersion.

### 3 Game Design Document

#### 3.1 Core Concepts

**Game Title:** Dream Bunny Wonderland.

**Genre:** VR Adventure.

**Brief Description:** Players take on the role of an adventurer exploring a magical island inhabited by rabbits, solving puzzles and overcoming challenges to save the bunnies from an evil octopus overlord. The player takes on the role of an adventurer who hears tales of an island inhabited by numerous rabbits, which eventually develops into the Dream Bunny Wonderland. Fascinated by the stories, the adventurous player decides to explore it.

The amusement park's owner is an outsider who took over Bunny Island and uses electronic collars to control the rabbits, forcing them to build the park. The protagonist, a passionate adventurer, arrives at Bunny Island and discovers King Bunny (NPC) during their journey. King Bunny explains why no rabbits are seen despite it being a bunny wonderland. It turns out that the owner is an evil octopus who has taken over the island and imprisoned the rabbits to use them as labor. Through exploration, the protagonist uncovers the history of the park. To rescue the suffering rabbits, the protagonist must defeat the evil owner, ultimately freeing the rabbits and returning the island to King Bunny.

#### 3.2 Game Flow

A game flow that includes three mini-games and a points and ranking system, ultimately leading players to the final stage (see Fig. 2).

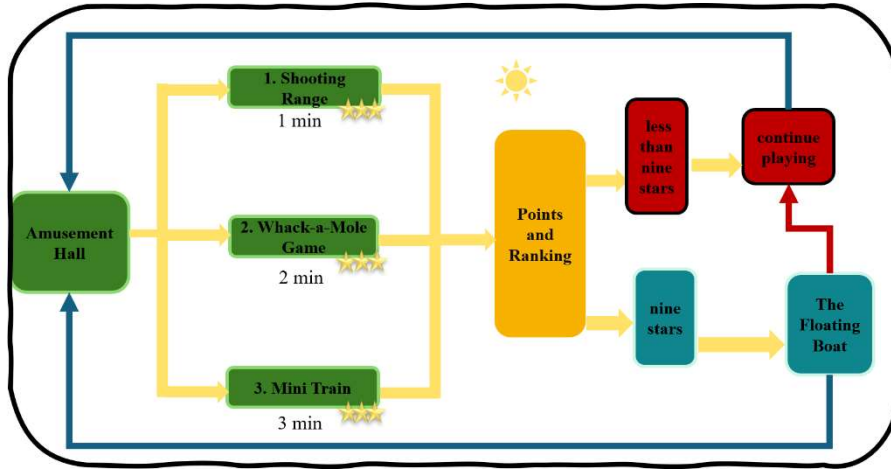


Fig. 2. Game Flow

This game flow diagram outlines the player's journey starting from the Amusement Hall, where they begin their adventure. Players participate in three mini-games: Shooting Range (1 minute, 3-star difficulty), Whack-a-Mole Game (2 minutes, 2-star difficulty), and Mini Train (3 minutes, 3-star difficulty). In each mini-game, players aim to complete specific challenges within the time limit, earning stars based on their performance. After completing these mini-games, players' scores are recorded and displayed on a ranking board. If players accumulate less than nine stars in total, they are directed to continue playing the mini-games to improve their scores. However, if they accumulate nine stars, they qualify to advance to the final stage, the Floating Boat, where they face the ultimate challenge. This structured flow ensures a gradual increase in difficulty, while the points and ranking system adds a layer of competitiveness and achievement, encouraging players to enhance their performance and progress through the game.

### 3.3 Designing Game's Visual Style

For object creation, we use 3ds MAX and ZBrush for modeling, followed by texturing with Substance Painter. Finally, we import the models into Unity to present the final appearance. Fig. 3 is a full view of a game scene. It depicts a colorful and vibrant island environment, likely part of a game world. Here's a detailed description:

**Island Layout:** The island features various elevations and terrain types, including flat areas, hills, and cliffs.

**Buildings and Structures:** There are several buildings and structures, including a central building with a large wheel, smaller houses, and other structures scattered around the island.

**Vegetation:** The island is adorned with cartoonish trees, some of which have pink rabbit-like features on them, adding to the whimsical and playful atmosphere.

**Paths and Bridges:** Wooden pathways and bridges connect different parts of the island, allowing traversal across different elevations and over gaps.

**Water Surroundings:** The island is surrounded by water, indicating it is isolated and gives a sense of adventure and exploration.

**Interactive Elements:** There are various interactive elements such as a merry-go-round, lampposts, and possibly other game-related props and items.



Fig. 3. Scene Description.

### 3.4 Setting, Levels, and Characters

The characters are designed in a cute, cartoonish style, fitting well with the overall whimsical aesthetic of the game.



Fig. 4. NPC.

**Props and Decorations:** Items like lampposts, benches, plants, and other decorative objects enhance the environment, making it more immersive.

**Interactive Objects:** Objects like bridges, gates, and structures with specific designs hint at interactive elements that players might need to engage with to progress through the game.

This image provides a comprehensive overview of the game's setting, levels, and characters, illustrating a well-thought-out design process aimed at creating an engaging and whimsical game world. The diverse elements suggest a rich, interactive environment where players can explore different zones, meet various characters, and enjoy a variety of gameplay experiences (see Fig. 5).



Fig. 5. Props and Decorations

Here is a detailed description of what could be included in the game demo screenshots based on the provided game assets and settings. These screenshots will provide a comprehensive overview of the game, showcasing various gameplay elements, interactions, and the vibrant, whimsical world of "Dream Bunny Wonderland."



Fig. 6. Game screenshots

## 4 Conclusions

"Dream Bunny Wonderland" is a whimsical and engaging VR adventure game designed to offer players an immersive and interactive experience. Leveraging advanced modeling tools such as 3DMAX and ZBrush for detailed object creation, along with Substance Painter for vibrant texturing, the game presents a visually captivating world. Unity serves as the backbone of the game's development, seamlessly integrating these elements to create a cohesive and dynamic environment. Throughout the game's development, careful attention has been paid to creating a rich, interactive experience.

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