ÖĞRENMEYE SINIRSIZ ÖZGÜRLÜK

Group Name: Comp'ilers
Project: Tower Defense 3D

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Abstract

Our 3D version of the tower defense game offers an immersive experience where players strategically build and upgrade towers using in-game resources to defend against the enemies. Each tower possesses unique characteristics and abilities and players must strategically position their towers to prevent enemies from breaching their defenses. Resource management is crucial in balancing the allocation of funds for constructing, upgrading, and repairing towers. In our version of the project, the 3D environment enhances the visual experience, and as players progress, they face more challenging enemy waves. This 3D rendition aims to provide an engaging and visually captivating tower defense experience from a fresh perspective, combining strategy, resource management, and immersive gameplay.

1. Introduction

We have developed a 3D version of the highly popular tower defense game. At the start of the game, players are provided with a set amount of in-game currency or resources, which they can utilize to construct and upgrade a variety of defensive structures known as "towers." These towers act as the primary line of defense and can be strategically positioned along the path or map to engage and eliminate enemies. Each tower possesses unique characteristics, including attack range, damage, firing rate, and special abilities, allowing players to customize their defenses.

As the game progresses, waves of enemies traverse predefined paths, posing a threat to the player's territory. The objective is to thwart their progress and prevent them from breaching the defenses. Enemies present varying strengths, speeds, and abilities, necessitating careful strategic planning and adaptation of tower placements. Resource management assumes a critical role as players must carefully allocate their funds, considering factors such as constructing new towers, upgrading existing ones, and repairing or selling ineffective towers. Making wise decisions with limited resources becomes crucial for achieving success.

In our 3D version, players will experience an immersive environment with enhanced visuals and depth. As players progress through the game, they will encounter increasingly challenging enemy waves, necessitating clever tactics and tower combinations to ensure victory.

With the fusion of 3D graphics, strategic gameplay, and resource management, our tower defense game aims to deliver an engaging and visually captivating experience for players. It provides an exciting opportunity to delve into the world of tower defense from a whole new perspective, allowing for more immersive and dynamic gameplay.

1.1. Initial Goals

Create a 3D Environment: We design and create a visually appealing 3D environment for our tower defense game. This includes creating terrains, paths, and obstacles that fit the theme of the game.

Implement Tower Placement: We developed a system that allows players to place towers on the map. This involves creating a user interface for tower selection and positioning the towers within the game world.

Enemy Wave System: We designed and implemented a system to spawn waves of enemies that follow predefined paths. Also considered varying attributes, behaviors, and animations to add diversity to the gameplay.

Tower Mechanics: We implemented the core mechanics of towers, including their attack range, damage output, firing rate, and special abilities. We also needed to ensure that towers can target and attack enemies within their range effectively.

Resource Management: We created a system to manage in-game currency or resources. Players should earn resources by defeating enemies and be able to spend them on building and upgrading towers.

Enemies and Pathfinding: We developed some behaviors for enemy units, enabling them to navigate the map, follow the path, and make decisions.

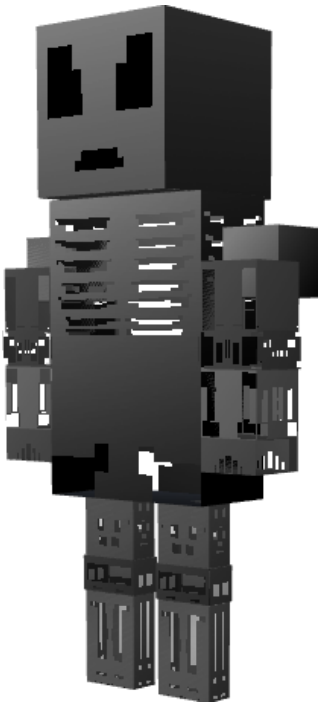
Game UI and User Experience: We designed and implemented a user interface that displays relevant information such as player resources and game progress. We ensured a smooth and intuitive user experience for towers and interacting with the game.

Visual and Audio Effects: We enhanced the game's immersion by adding visual effects for enemy destruction, environmental elements etc. We incorporated music for the main menu that complement the gameplay experience.

2. Implementation

2.1. Designing Process

2.1.1 Models



We mostly used Blockbench for creating our models. Other than basic 3D models in Unity, we created every other model that we used in this project. In our project, we progressed in our first weapon from the laser weapon, we learned details of modeling as we progressed in our project. At first, our models were just basic cubes, but at last, we created our models using “meshes” in Blockbench which allows you to cut, insert, extrude some of the model parts.

Our First Design for Enemy

2.1.2 User Interface

We used different images and buttons while we created our User Interface (UI). We also used our models while we created a “Buy” Button that allows users to add towers into the game. We also added a pause UI if the player wants to stop the game. For stopping the game the user has to use button “P” and they can also stop camera if they want to by pressing “esc”.

2.1.3 Map

You can see a simple example of our game in the figure. There is also soul (our in game currency) and the time that indicates the next wave.

Example Scene from our game

2.2. Learning Process and Achievements

At first we tried to implement different types of enemies, But we encountered animation problems with unity, our models were just staying still or they weren't moving exactly what we wanted. Therefore we couldn't implement every enemy type we wanted but we tried our best to keep our game more variable to give better gameplay experience.

More Detailed Enemy Design

3. Conclusion

In conclusion, our team successfully developed a captivating tower defense game in a 3D environment, meeting the requirements outlined in the rubric. Throughout the project, we improved our skills in Unity development, programming, teamwork, object-oriented programming, and time management. The experience of working with Unity expanded our understanding of game development and its features. We enhanced our programming abilities by implementing game mechanics, and also collaborating as a team improved our communication and coordination skills. Effective time management was definitely crucial to balancing our commitments.

4. References

How to make a Tower Defense Game:
https://www.youtube.com/playlist?list=PLPV2KyIb3jR4u5jX8za5iU1cqnQPmbzG0

Unity Temel Ana Menü Yapımı - Buton Fonksiyonları ve Onclick Events:
https://www.youtube.com/watch?v=CAoo4ah1u_w

Basit Ses Ayarlama Menüsü Yapımı - Unity:
https://www.youtube.com/watch?v=haxXYV-fAH4