

# Constructing A 3d Game With Unity 3d Game Engine

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**Abstract**—The Unity editor is a user interface designed for developing game projects in the Unity3D game engine. One of the advantages of Unity over other game engines is that it allows the developer to write program code at the time of game development. While most other game engines separate graphics and code, Unity works with graphics and code. In our project, Unity is a comprehensive program used to draw 3D models, design character skeletons, and create terrain and maps.

## I. INTRODUCTION

In the rapidly developing information age, technology is constantly evolving and offers unique perspectives on how the world works. In recent years, especially in the game industry, medical imaging, maintenance and repair, robot path planning, entertainment and military aircraft navigation and targeting, informatics, design, health and education, real world and virtual images are combined between real and virtual objects and interaction is provided.

Unity3D [1] is a free game engine and developed by Unity Technologies company. Game engine basically refers to the general name given to the programs used to make games. Thanks to the functions defined using programming languages, it is aimed to do a lot of work by writing less code.

Unity3D game engine is one of the most widely used programs today. In addition, it is a game engine that supports platforms such as PC, MAC, Linux, Android, iOS, Windows Phone, BlackBerry, XBOX 360, PS3 as well as platforms such as Web Player and Google Native for the internet and has become the choice of programmers.

Using a unique programming structure, Unity3D offers the possibility to code in JavaScript, C # and Boo languages. This coding process is provided by the MonoDevelop code editor that comes with the Unity3D installation [2-4].

In the project, a game project to be written in C # language will be realized using the Unity3D game engine. Items required for the design will be purchased free of charge from the Unity Asset Store. to With the graphical interface provided by Unity3D, objects will be added to the scene, their properties will be adjusted and the necessary codes will be written according to the scenario.

## II. DEVELOPMENTS IN GAME HISTORY

The first technically made game was Tennis For Two. Spacewar, made by MIT engineers in 1962, is a two-player game that is described as a shooter game. It is considered as the beginning of video games [5].

In 1972, Atari Inc. introduced the game machine called Pong, a two player table tennis game. In 1978, Space Invaders, developed by Tatio, earned nearly \$ 2 million by selling three hundred thousand arcade cabins. In 1982, Commodore released the personal computer named Commodore64 for sale and earned the title of best selling computer within a year. In 1985, Introduced by Nintendo, the Nintendo Entertainment System (NES) has gained immense popularity and has single-handedly dominated the North American and Japanese markets [6].

In 2004, World of Warcraft, which has over ten million paid users today and developed by Blizzard, was put on the market and within the first week it became the fastest selling game in the USA [6]. World of Warcraft (WoW) is an MMORPG, a massively multiplayer online role-playing game developed by Blizzard Entertainment. It is the 4th game of the Warcraft series, which was first introduced with the Warcraft: Orcs & Humans game, which was released in 1994, but the games before this game were in the real-time strategy (RTS) genre. World of Warcraft was first announced by Blizzard Entertainment on September 2, 2001 [7].

Demon's souls released in 2009, is a third person RPG game; It is a game with a life cycle including increasing the nerve coefficient and eventually reaching a high level of patience. The game uses the HAVOK engine and has the most effective graphics and gameplay of the era [8].

Unity3D is a game engine developed and published in Russia. In fact, the purpose was not to make games, but to be used for something different. The aim was to be able to play the games over the internet with Unity Web Player without installing them on your computer.

Unity3D, with its 4.0 version released in December 2012, officially allows you to make games for Desktop, Android, IOS, Flash Player, PS3, Web Player and XBOX platforms. Unity3D is a game engine that allows you to make 3D games,

but 2D games can also be made, but since the engine is 3D, it is recommended to make a 3D game.

The Unity3D game engine was developed by Unity Engines with C / C++. With Unity 4.0 version, it supports your game development with C #, JavaScript, Boo and DirectX languages.

Many famous games such as Battlestar Galactica, Legends of Aethereus were designed with Unity3D. This status applies for mobile games, games such as Run 2, Dead Trigger 2, Bad Piggies, Bladeslinger are also designed with Unity3D [4].

### III. PROJECT STRUCTURE

The subject of the project is to create a new and original 3D game using today's technology. Free Unity3D environment will be used in the project. C # will be used as the working language. The items required for the design will be provided free of charge from the Unity Asset Store. Steps to take while doing the project; Items will be added to the scene and their properties will be set. Necessary code will be written for the objects to be used.

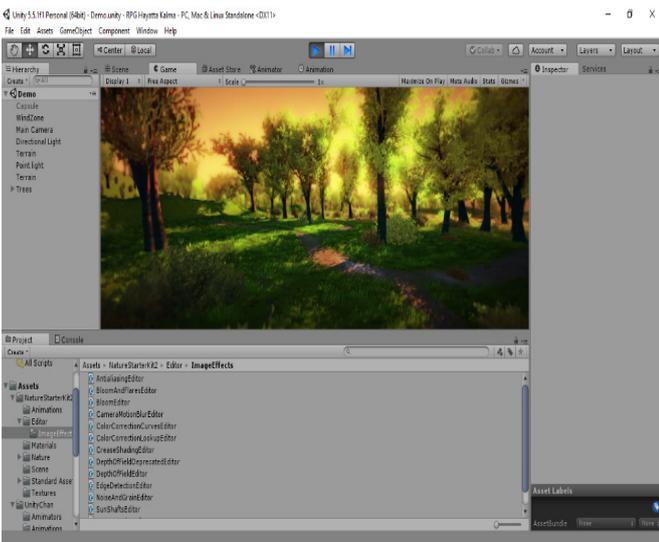


Fig. 1. Unity game introduction page

The game type to be studied in the project is aimed to be an RPG (role-playing game) that will be similar to World of Warcraft and Dark Souls games (see Fig.1). It is aimed to create a different design and an original scenario, unlike other made similar ones.

Object Oriented logic is used in game programming with Unity3D. With this method, the code becomes more readable and understandable. Before starting the coding part, analysis and design are done. The object behaves according to the added script. One script code can be used for several objects.

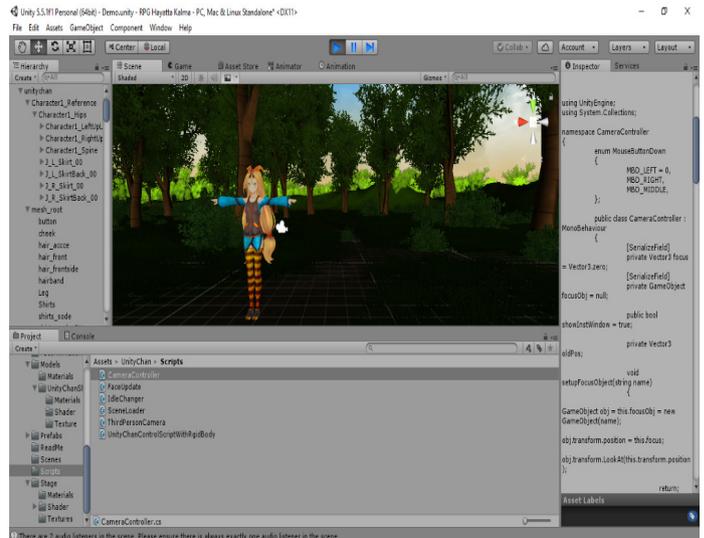


Fig. 2. Unity game main page

The Unity editor is a user interface designed for developing game projects in the Unity3D game engine (see Fig.2). It is a comprehensive program that can draw 3D models, design character skeletons, create terrain and maps. Unity Asset Store is a shopping platform where multimedia content is shared using the Unity3D game engine. Features such as 3D model, texture, sound downloaded from the Asset Store are imported into the project and included in the project. Properties of objects can be changed with Inspector. Adding Scprit is added C # code as a file with add component from Inspector section. In this way, the object is qualified.

### IV. GAME MODELS AND MATERIALS

An RPG game design that is free of charge in the Asset Store was used in this project. If we want to move the character or add an event, we need to add a script file to the components of that character.

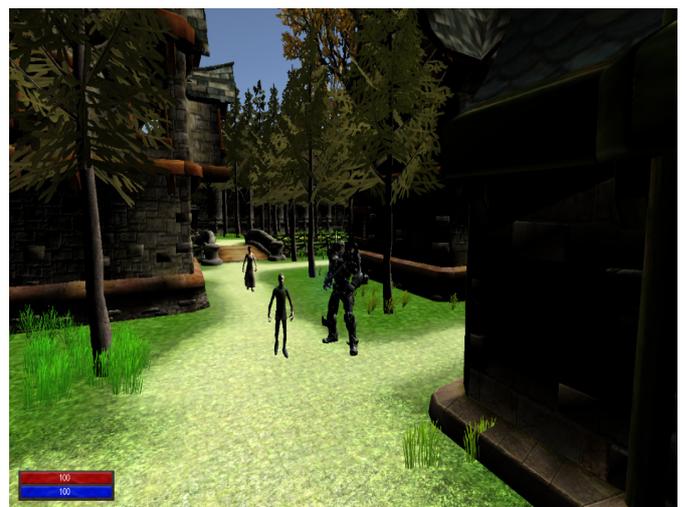


Fig. 3. Villagers

When we create the characters (see Fig.3) we need to add a camera to the character so that we can add a behavior and take images. A visual node-based editor makes it easy to add interactive dialogue and tasks to your game. Dialog UI is a complete, robust solution that includes, cutscenes, quest logs, save / load and more.



Fig. 4. Villagers

Unity3D gives the right to publish games developed with Unity3D. With this feature, Unity3D is a highly preferred game engine.

V. GAMEPLAY

The Role Playing Game - RPG game is an all-time mark. This type of games, as the name suggests, is based on Role-playing. In other words, you run from adventure to adventure with the character you create in a completely different Universe or in a place similar to our Earth (see Fig.4). You will find the opportunity to develop your skills and experiences that you can develop in real life in this game. RPG game is a unique type of game that gives you the chance to exist in a different world with a character you create.



Fig. 5. Villagers

At the beginning of the game, the character starts the game at the location determined as the starting point (Midpoint) of the map (see Fig.5).



Fig. 6. Character Display

Then, in the computer environment, the character is moved using the W / A / S / D keys and the Mouse (see Fig.6). Jumping movement can be added to the character with the Space key. Right click with mouse can be used for fighting, left click can be used for a special skill. After starting the game, depending on the user's request, the character can fulfill the task or explore the world it is in (see Fig.7).



Fig. 7. A game image

VI. CONCLUSION

Games (especially computer games) is a sector with a very large market today. Making a great game is the dream of many developers. However, this requires people who have developed themselves in their fields and large budgets. There are many different field requirements in game design, such as software, graphics and testing. Large budgets are not always needed for the game to be successful. Sometimes simple games made by one person are become successful like big games and they are also mentioned.

Coding is indispensable for the programmer. It is important to understand the logic of coding for someone who wants to make games. In this game project, pieces of code that have a great contribution in developing algorithm creation are written. Unity 3D and similar game engines teach people to

understand and create algorithm logic and how to solve a problem step by step, even how a project should be executed.

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