

ONLINE GAMING CREATION FOR BEGINNERS

A Technical Report submitted to the Department of Engineering & Applied Science

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**On my honor as a University Student, I have neither given nor received unauthorized aid
on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments**

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Introduction

The gaming industry has come a long way since its inception, evolving from simple pixelated graphics and limited gameplay to immersive, visually stunning worlds with complex mechanics and engaging storylines. Games are where all game designers create their worlds, especially for large-scale games. All background concepts, perspectives, characters, and game plots are a new world a group of designers presents after brainstorming. Becoming one of them and putting my ideas into the gaming world is fantastic.

Games are where all game designers create their worlds. Especially for large-scale games, all background concepts, perspectives, characters, and game plots are a new world presented by a group of designers after brainstorming. Becoming one of them and putting my ideas into gaming is fantastic. In a computer class in high school, the teacher showed us how to make the most straightforward stick-man basketball game. We started with the basic drawing and stopped at the animation part. Although the base game has no coding, it also made me curious about making games. Thus, I selected computer science as my major.

As a game designer, the first step in creating a game is developing a concept. This involves brainstorming, researching the market, and considering the game's target audience. Once the idea is settled, we, as the designer, create the game world, characters, and mechanics. This process involves writing storylines, designing environments, creating art assets, and developing game mechanics. It requires a combination of creativity, technical skill, and attention to detail. In addition to game design, the technical aspects of game development are just as important. Programming languages such as C# and JavaScript are essential for developing interactive gameplay and mechanics. As a computer science student, I've learned the basics of programming and am excited to apply that knowledge to game development. I plan to learn other

languages and tools, such as Unity, Unreal Engine, and GameMaker Studio, to develop my skills further.

On the other hand, as a gamer, I understand the impact games can have on individuals and society. Games have the potential to educate, entertain, and inspire players. Games can also serve as a platform for social commentary, raising awareness of important issues, and promoting social change. Games can be a powerful tool for positively impacting the world. Gaming is a form of entertainment that conveys unique experiences and emotions to players.

As technology advances and game development tools become more accessible, I am excited to learn and explore the endless possibilities of creating my own game worlds. In addition to my interest in game design, I am fascinated by game development's technical aspects. I learn many things throughout the learning progress of using Unity and programming languages such as C# and JavaScript, creating interactive gameplay, and developing immersive game mechanics. Therefore, this report aims to document the learning process and results of creating games using Unity, a popular game development platform. The report will cover various aspects of using Unity, including its foundation, hands-on activities, learning summary, using Unity in the future, and conclusion.

Foundation of Unity

First Touch on Unity

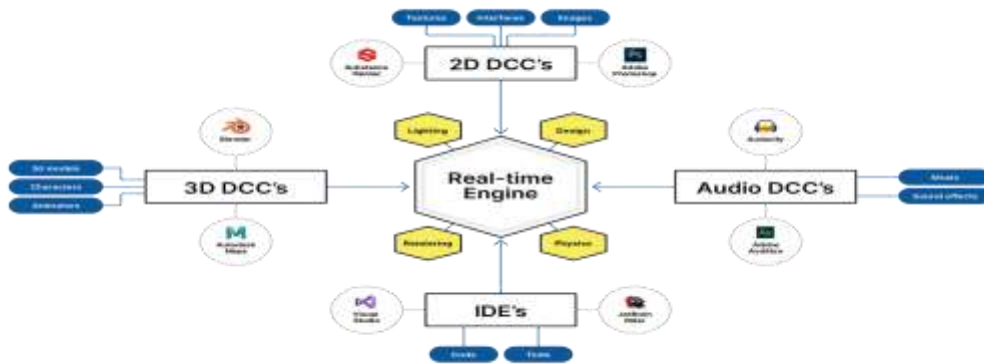
At the beginning of last semester, the first topic I learned was unity essential. Under this topic, many videos and texts describe the fundamental knowledge about Unity. The best way to learn is to understand the tools that will be used for this knowledge first. The best thing about

Unity is that we are learning its tools by using them. With a touch-base quiz, I begin my gaming creation journey.

The Actual Theory of Unity:

After playing the basic game, the actual teaching begins. Theoretical knowledge of Unity starts with various short videos. From the introduction of why we should learn Unity to what Unity is and then to other Users' views on Unity. In that video, many people in different fields discuss how they relate to Unity. Areas such as people from the Mathematic team who are trying to build 3-D math models or other fields like Biology, architecture, software engineering, and of course, game design. Each of them gives some words describing what Unity means to them, such as self-learning, curiosity, problem-solving, collaboration, self-esteem, and patience. Then, this sub-chapter ends by describing Unity tools that would help Both existing and new users find a solution to problems and provide ways to communicate with others who also use Unity.

The following subchapter is composed of text and pictures. They start by describing Real-time creation and Game engines. Real-Time creation is how quickly an image is rendered or displayed on the screen, and the game engine is the point of convergence for all aspects of creating a game. Game Engine combines 3D models, textures, audio, scripts, animation, and 2D sprites, which users will experience all those features in the final product. With the Dos and Don'ts in sections, I learned things I can and cannot do in Unity. This chapter ends with all the benefits of using Unity since Unity can easily create interactive content, iterate on design concepts faster, see our final product at all times, and it is user-friendly in the way that user is able to reuse content across many projects.



The last sub-chapter of this semester is where I play around with the basics of creating games. Here, the main camera is where I control what players will see as the play mode, the directional light is where I control the lighting to create realistic visual effects, and the primitives are shapes in gameObjects that I can use to build buildings, roads, and stair. Aside from that, there are also places where I can control an object's position, rotation, and size.

Section Summary

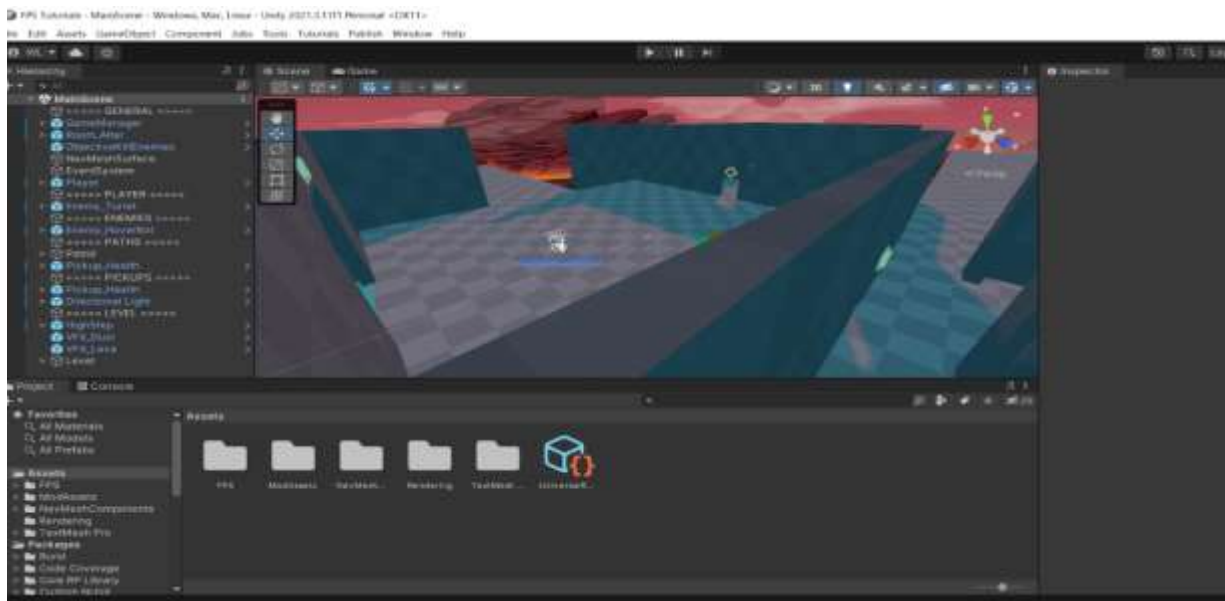
The first semester of the learning process goes through the most fundamental portion of creating games using Unity. The most important knowledge is that creating a game is more complex than making a sandwich. Although the concept of stacking multiple things together is the same, creating games requires way more knowledge. Thus, large-scale games are completed within a team of developers. Someone draws graphics; someone makes graphics; someone creates game backgrounds; someone adds music elements to the game; someone writes code; and someone provides logistics services. Building games is a team project, but before joining a team, we must strengthen ourselves since dreams only come true when we do them step by step.

Hands-On Activity and Learning Summary

Creation One: First-Person Shooter Game

First-Person Shooter Game is a video game where players can take on roles using weapons to fight against other characters controlled by humans or computers. The first person means that players see the game world through their own eyes while controlling the character. First-person shooter games can be played solo or in multiplayer mode, where players can team up to complete objectives or engage in competitive gameplay. Multiplayer games often include a range of different game modes, such as team deathmatch, capture the flag and objective-based gameplay.

This is one of the games that sounds interesting to me, and before watching videos and texts, as a new learner, I need to learn what they already have. Choose at least one of the three games to try. Therefore, out of the three options: Lego games, escape games, and shooting games, I chose the first-person shooter game as the first game that I am going to modify in Unity. Before playing the game, there is a tutorial that walks me through some minor changes I could make. Things include moving the screen page, adding a new room, changing color, creating an enemy, and more.



(Figure for First-Person Shooter Game)

Overall, creating a first-person shooter game in Unity was a valuable learning experience. It allowed me to develop technical skills while also exploring the creative aspects of game development. Although it is the most straightforward game, this is still a great way to make me more interested in game creation and think that game requires a lot of creativity and problem-solving skills. After completing the tutorial, I felt more confident modifying and creating a first-person shooter game in Unity. With this engaging experience, I started exploring the different tools and features available in Unity to design and build a more complex game.

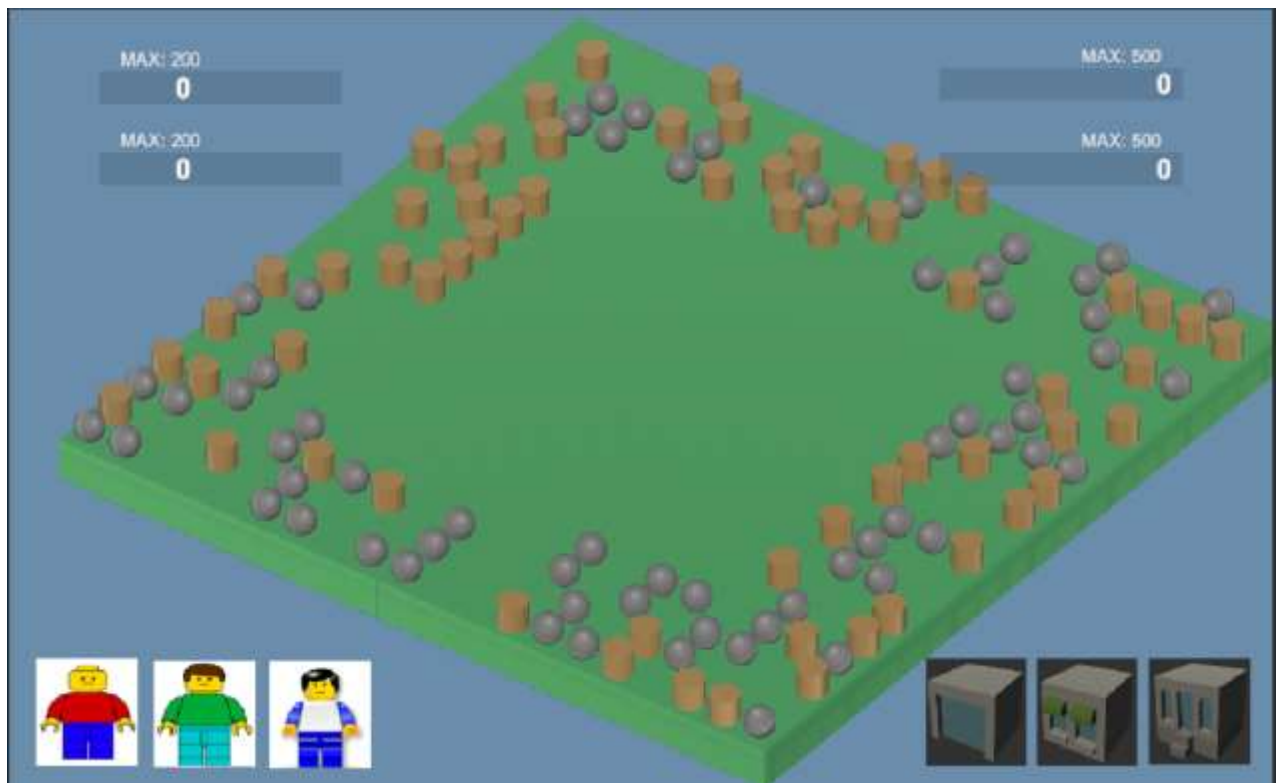
Creation Two: “City Builder” Game

The City Builder project in Unity is a comprehensive tutorial. It covers everything from setting up a new 3D project to implementing game mechanics and optimizing performance that allows users to interact with the system. I learned a lot about creating a city builder game in Unity. One of the first things I learned was how to create a new 3D project and set up the basic environment. From there, I learned how to make different building models and assets using 3D modeling software. In addition to creating the visual aspects of the game, I also learned how to develop scripts and code to implement the game mechanics. The tutorial also covered game mechanics, such as creating a system for collecting and managing resources, building and upgrading buildings, and managing the overall gameplay experience.

Throughout the seven sessions and fourteen videos, I learned about optimization techniques to ensure the game runs smoothly and efficiently. This included techniques such as object pooling and efficient resource management. One of the challenges I faced while working on the project was balancing the complexity of the game mechanics with the user experience. One of the most minor but also annoying parts of the project is to provide a map background that will be set as the foundation for resources and building. In the project, we called it “tile”. The

angle of the tiles, models, assets, and event texts must be in a position that the user can easily view. By going through all the tutorials and self test the project, I learned about the importance of user feedback in game development.

Another valuable lesson I learned was the importance of planning and organization in game development. Creating a game requires careful planning and attention to detail. Without a clear plan, it's easy to get lost in the complexities of game development and fail to grasp the overall vision for the game. Every step of the game is critical, both from the user's and developer's perspectives. Like the City Builder game, as a developer, we can't write all the code and plan the position of each square or other object on the map. Staying focused and making steady progress throughout the project has to be done by planning game mechanics and goals ahead of time.



(Figure for City Builder Game)

The City Builder project in Unity is a challenging but rewarding learning experience. It allows me to develop technical skills while also exploring the creative aspects of game development. It also allowed me to develop technical skills such as asset creation, scripting, and UI design while exploring game development's creative elements. I am confident in creating complex games in Unity and am excited to continue exploring this fascinating field.

Using Unity in the Future

Unity in Different Fields

Unity is a platform with lots of different possibilities. One of the exciting features is the creation of Virtual Reality (VR) games in Unity game development. With the rise of VR technology, there is a growing demand for high-quality, immersive VR experiences. Unity has become a popular platform for creating VR games due to its ease of use. In addition to game creation, Unity has a wide range of applications in other fields. For example, its powerful 3D modeling and animation capabilities make it an excellent tool for creating visualizations for architecture, engineering, and construction projects. It can also be used for AI generating, machine learning, and computer science-related topics. Unity can also create medical simulations and training programs for healthcare professionals. This is a beneficial aspect. If we can carry out online medical simulations and training, then medical personnel will be able to have their self-improvement methods outside of their studies.

Coding Using Unity

As mentioned above, Unity is a valuable tool for learning programming and game development, and it is also a dual-level experience of programming and vision. For example, the simplest and most basic introductory programming, "Hello World", can be explained in the form

of animation. And the user-friendly interface and comprehensive documentation make it an accessible platform for beginners to learn how to code and create games. As an aspiring game developer, these alternative apps to Unity have given me more opportunities to apply my skills and explore new territories.

Unity Under Education Mode

Another functionality of Unity is to use as a powerful tool for education. One of Unity's most notable strengths is its ability to create interactive simulations and virtual environments. With Unity, educators can create interactive simulations that help students learn complex concepts in a more engaging way. For example, an English teacher can simulate each scene of each article and allow students to immerse themselves in the author's thoughts in an in-depth manner. Physics teachers can use Unity to simulate how different forces interact. Chemistry teachers can use Unity to simulate the effects that the addition of different chemical components will cause. History teachers can create virtual tours of historical sites, allowing students to explore and learn about history in a more engaging and interactive way.

Not only teachers but Unity can also help students develop essential skills like problem-solving, collaboration, and creativity. By working on projects in Unity, students learn how to think critically, work in teams, and come up with innovative problem solutions. Thus, Unity is a great way to encourage students to explore their interests and develop their passion for game development or other related fields.

Conclusion

From basic concepts to more advanced features, I gained a solid understanding of the Unity game development platform. From projects like building a simple stickman basketball

game in high school to creating complex city-builder simulations, I've learned that game development requires not only technical skills but also creativity and critical thinking. And this software allows me to unleash my creativity and build amazing 3D environments, characters, and games. The skills I learned through Unity, such as coding, object-oriented programming, and game design, apply to the gaming industry and other fields that require interactive or immersive experiences.

Unity provides individuals with a platform to bring ideas to life and develop engaging and fun games. The City Builder project, particularly, challenged my ability to think critically and solve problems when developing complex games. The combination of creativity, technical skills, and enthusiasm required for game design and development make it a challenging but rewarding field. Unity provides a unique platform for exploring creativity and problem-solving skills while developing engaging and entertaining games. I look forward to developing my skills, collaborating with other professionals, and creating games that entertain, inspire, and make a positive impact. Through various tutorials, projects, and hands-on activities, I gained a deeper understanding of game development and valuable technical skills that will benefit me in the future. As I continue learning and improving my Unity skills, I'm excited to develop my own games from scratch. I'm excited to continue my journey in the games industry as a new game designer and developer.

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