

INFO 5900
Virtual Reality and its Applications

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ABSTRACT

The Animal Hunt Game is a virtual reality game designed to provide an immersive hunting experience for the players. The game is designed to showcase a jungle environment, where players can hunt different animals with varying levels of difficulty. The target audience for this game is people who are interested in outdoor activities and hunting, but cannot pursue these activities in real life due to various reasons. The objective of this game is to provide a realistic hunting experience to the players while promoting the conservation of animals.



Fig 1: The above picture describes the Virtual environment of the forest.

Need of the Work and Importance:

The ANIMAL HUNTING gaming project in Unity 3D is important because it provides an opportunity for users to experience a simulated hunting environment in a safe and controlled manner. This project aims to educate and raise awareness about the ethical and sustainable hunting of animals while also providing entertainment to users.

VR environment:

The VR environment showcases a hunting scenario with various animals that the user can interact with. The game includes two levels that are designed to simulate different types of hunting environments, such as hunting in a forest or a savanna. Through this immersive experience, users can gain an understanding of the different types of animals, their habitats, and the appropriate hunting techniques for each species.

Target audience:

The target audience for this VR application is individuals who have an interest in hunting or wildlife conservation, as well as those who are looking for an entertaining and educational gaming experience. This application is useful for those who may not have access to hunting environments or want to learn in a safe and controlled manner.

Intention:

The intention behind this project is to promote ethical and sustainable hunting practices and provide a platform for education and awareness. By showcasing the importance of respecting animals and their habitats, this VR environment encourages responsible hunting practices that are essential for maintaining the balance of the ecosystem.

Use of this application:

Overall, The ANIMAL HUNTING gaming project in Unity 3D is a valuable tool for education, awareness, and promoting ethical hunting practices while providing an entertaining gaming experience. It provides a safe and controlled environment for users to experience hunting and gain knowledge of responsible hunting techniques, making it an essential resource for both novice and experienced hunters alike.

INTRODUCTION

The Animal Hunt Game is designed to provide an immersive experience to the players, where they can hunt different animals in a jungle environment. The game is designed to showcase the hunting experience in a realistic way, using virtual reality technology. The game environment is designed with various elements such as terrain, vegetation, and animals that provide a realistic hunting experience to the players. In this report, we will describe the different aspects of the game environment and the implementation details of the game functionalities.

The ANIMAL HUNTING gaming project in Unity 3D is a virtual reality application that aims to promote ethical and sustainable hunting practices while providing an entertaining gaming experience. The project showcases a simulated hunting environment where users can interact with various animals and learn about their habitats and appropriate hunting techniques for each species.

With the increasing concern for animal welfare and the need to educate individuals on responsible hunting practices, this project provides a safe and controlled environment for users to experience hunting without causing harm to animals or the environment. The game includes two levels designed to simulate different types of hunting environments, providing users with a diverse and immersive experience.

The target audience for this VR application is individuals who have an interest in hunting or wildlife conservation, as well as those who are looking for an entertaining and educational gaming experience. This application is useful for those who may not have access to hunting environments or want to learn in a safe and controlled manner.

Through The ANIMAL HUNTING gaming project in Unity 3D, users can gain knowledge and awareness of ethical and sustainable hunting practices, including the importance of respecting animals and their habitats. This project promotes responsible hunting practices that are essential for maintaining the balance of the ecosystem while providing an entertaining and educational gaming experience.

Goals and Objectives:

- To promote ethical and sustainable hunting practices - The project aims to educate users on responsible hunting practices that respect animal welfare and the environment.
- To raise awareness about the importance of animal conservation - The project provides users with an opportunity to learn about various animals and their habitats, which promotes awareness of the need for conservation efforts.
- To provide a safe and controlled environment for users to experience hunting - The project allows users to experience hunting in a simulated environment, which provides a safe and controlled experience that minimizes harm to animals and the environment.
- To provide an entertaining and educational gaming experience - The project aims to provide an engaging and educational gaming experience for users that promotes awareness of responsible hunting practices.
- To provide a diverse and immersive experience - The project includes two levels that simulate different types of hunting environments, providing users with a diverse and immersive experience that enhances their understanding of hunting practices and animal conservation.
- To target a broad audience - The project aims to target a broad audience, including individuals who have an interest in hunting or wildlife conservation, as well as those who are looking for an entertaining and educational gaming experience.

Overall, the goals and objectives of The ANIMAL HUNTING gaming project in Unity 3D are centered around education, awareness, and promoting ethical and sustainable hunting practices while providing an entertaining and immersive gaming experience.

This Game consists of two levels, first level has few animals whereas, the difficulty level for the second scene is increased with adding more animals.

Level 1 Environment:



Fig 2: Above picture depicts the Level 1 Scene

Level 2 Environment:



Fig 3: Above picture depicts the Level 2 Scene

IMPLEMENTATION

The Animal Hunt Game is implemented using Unity 3D, which is a game development engine that provides various tools to create virtual reality applications. The game environment is designed using 3D models created in 3ds Max and Google Sketchup. The following functionalities are implemented in the game.



Fig 4: Above picture shows the vision of the environment

MODELLING

The envisioned virtual environment for the Animal Hunt game includes a dense forest with trees, rocks, grass, and other natural features. The animals will have unique movement patterns, sounds, and animations based on their species, such as walking.

The game will have a first-person perspective, and the player will navigate the forest using the WASD keys for movement and the mouse for looking around. The player can switch between different weapons, including a rifle, shotgun to hunt different animals.

The virtual environment and animals were modeled in 3ds Max and Google Sketch-up. The terrain was created using height maps and painted with vegetation and textures.

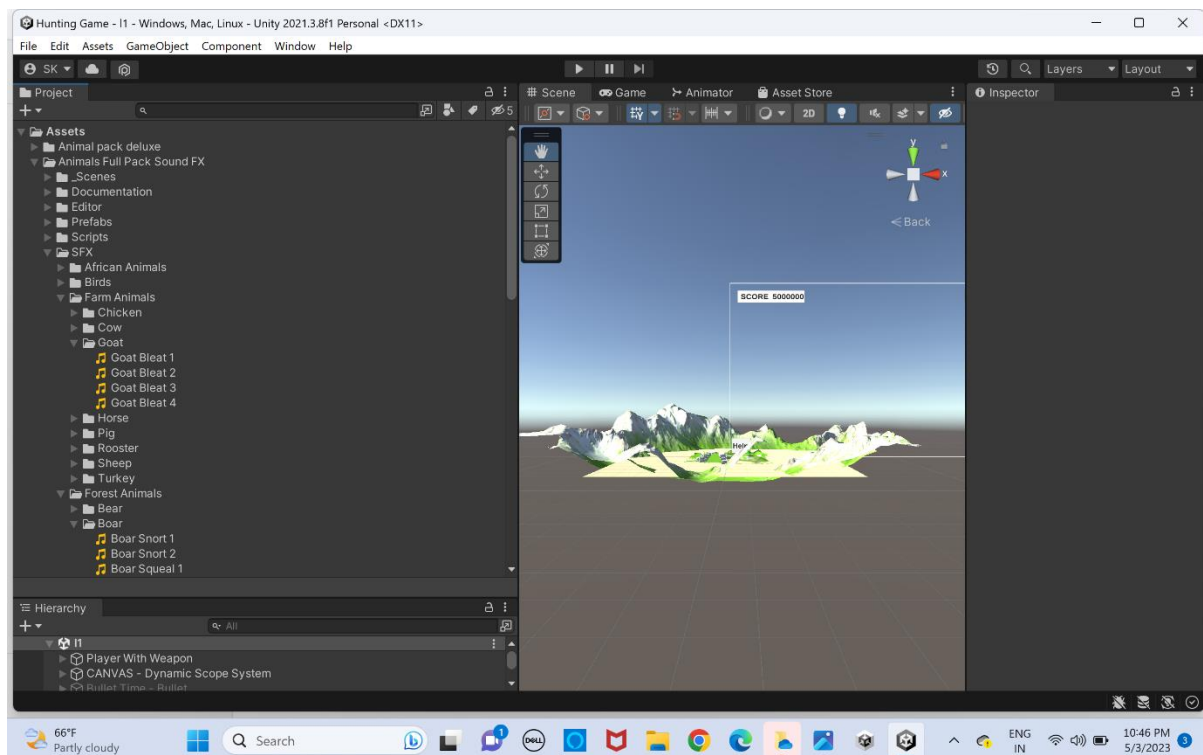


Fig5: Above figure shows the modelling part

In this game, 3D modeling software like 3ds Max or Google SketchUp can be used to create the game environment, including the terrain, trees, rocks, and other objects that the player will interact with. The software can also be used to create models of the animals that the player will hunt, as well as the player character.

In Google SketchUp, the modeling process is focused on creating objects. The software is designed to be intuitive and easy to use, making it a popular choice for beginners and small-scale projects.

Once the 3D models have been created, they can be imported into Unity and further optimized for real-time performance in the game. This process involves reducing the complexity of the models by removing unnecessary details and simplifying the geometry, while still maintaining the overall appearance and functionality of the object.

Overall, 3D modeling software is a critical tool for game development, allowing developers to create immersive and engaging game worlds that players can explore and interact with.

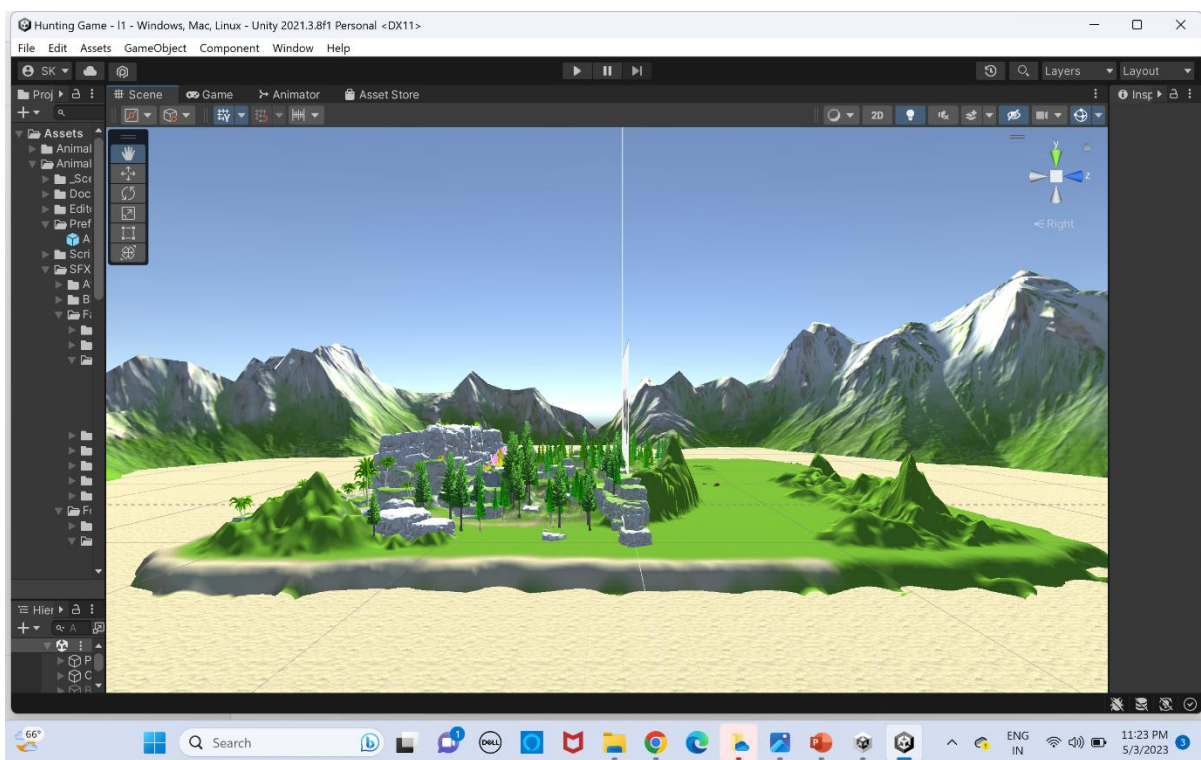


Fig 6: Above figure shows the Sketchup part

PROGRAMMING

C# is an object-oriented programming language designed by Microsoft for building Windows applications. It is a powerful language that is used to build a wide range of software applications, including video games. C# is known for its simplicity, type safety, and scalability, which makes it an ideal language for building complex systems.

In the above project, C# was used to implement several functionalities such as animal walking, game manager, and home script. The animal walking functionality involved programming the behavior of the animated agents in the environment. The agents were given a path following behavior to move around the environment in a realistic manner.

The game manager was responsible for managing different aspects of the game, such as scoring, timing, and game over conditions. This functionality was implemented using C# scripts to ensure that the game flowed smoothly and provided a seamless user experience.

The home script was responsible for managing the behavior of the user's avatar in the environment. The script allowed the user to navigate the environment and interact with different objects using keyboard input. The home script was also responsible for implementing different types of sensors to detect user interactions, such as proximity sensors to detect when the user was near an object.

Overall, C# was a suitable programming language for implementing the different functionalities in the project, as it provided the necessary level of flexibility and scalability required to build a complex virtual environment.

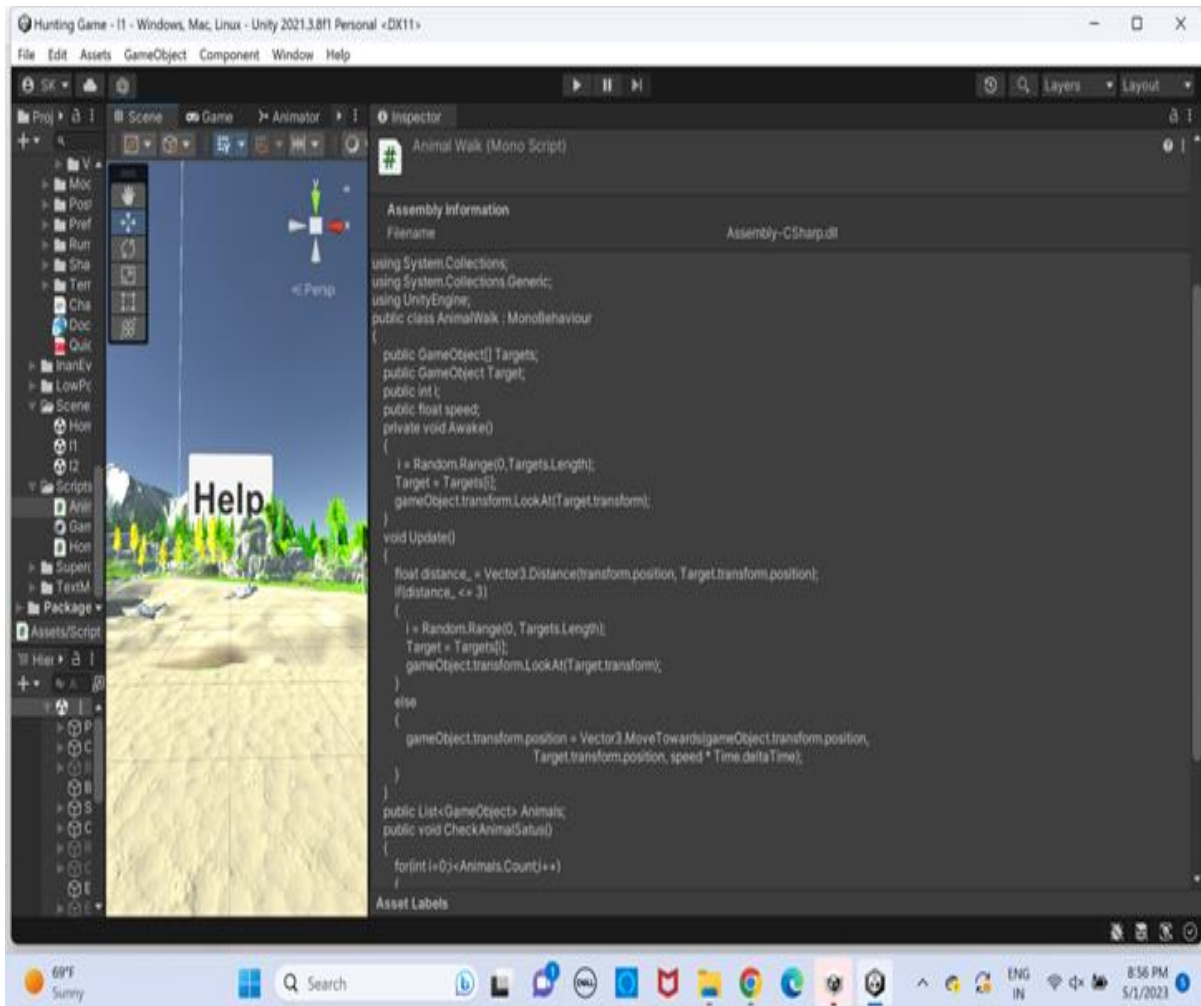


Fig 7: Above figure shows the animal walking functionality involved programming the behavior of the animated agents in the environment. The agents were given a path following behavior to move around the environment in a realistic manner.

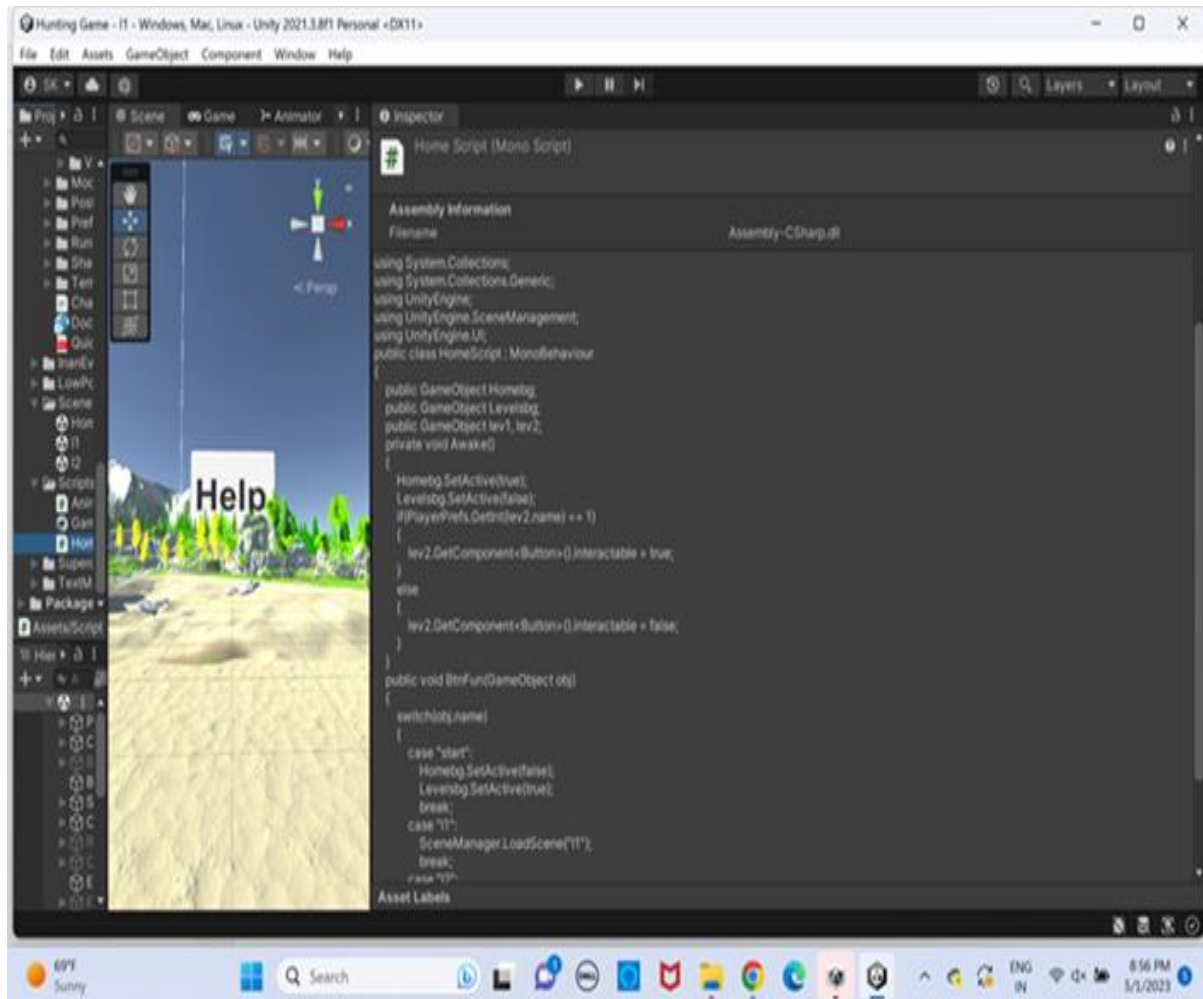


Fig 8: The home script was responsible to allow the user to navigate the environment and interact with different objects using keyboard input. The home script was also responsible for implementing different types of sensors to detect user interactions, such as proximity sensors to detect when the user was near an object.

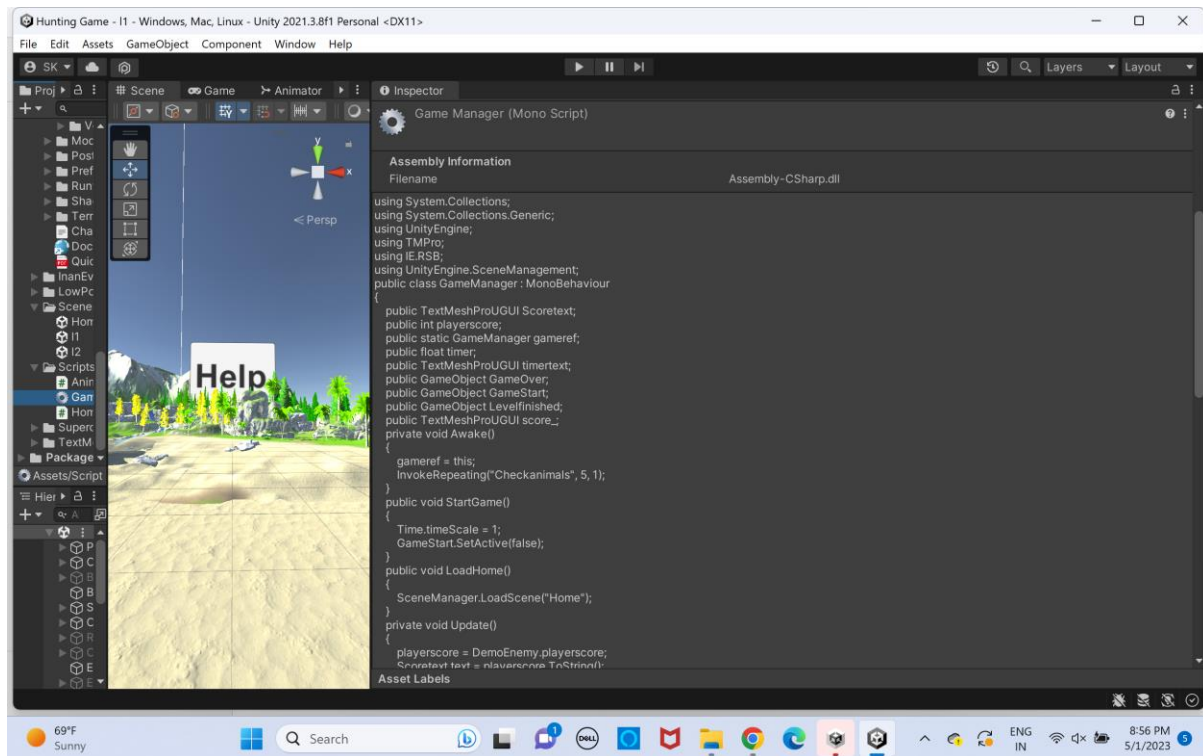


Fig 9: The game manager was responsible for managing different aspects of the game, such as scoring, timing, and game over conditions. This functionality was implemented using C# scripts to ensure that the game flowed smoothly and provided a seamless user experience.

FUNCTIONALITY

Vision:

Textures and 3D models are used to provide detailed information in the game environment. The jungle environment is designed with various textures such as grass, mud, and rocks that provide a realistic experience to the players.



Fig 10: Above figure shows the Vision of the Scene

Sound: Ambient sounds such as bullet sounds, animal noises, and environmental sounds are used to provide an immersive experience to the players.

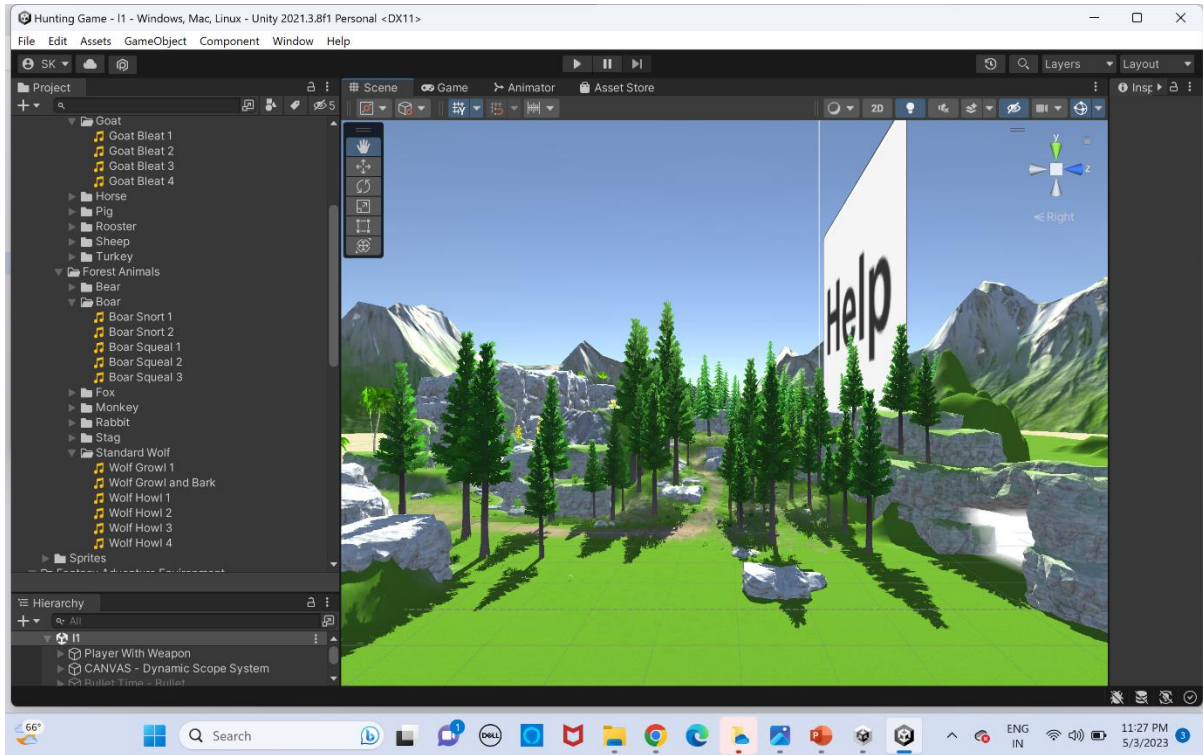


Fig 11: Above figure shows the Sound added in the Unity



Fig 12: Bullet and animal kill sounds included in the above scene

Animation: The animated animals **Goat, Wolf, Deer, Bear**, Movement of the **Leaves** and the **Water** flowing are implemented in the game environment.



Fig 13: Above figure shows the animation of the water flow



Fig 14: Above figure shows the animation of the Leaves falling.

Interactivity: Five User-triggered events such as shoot, reload, pause, walk and resume are implemented and we can view the distance between the gun view and for every individual animal in the game environment. These events are triggered by the player's actions and provide a realistic experience to the players.



Fig 15: Above figure shows the distance between the gun view and animal.

Instructions

Close

Scope

Mouse Right Click

Walk

W,A,S,D or Arrow keys

Shoot

Mouse Right Click

1 kill

bear - 400(points)
deer - 300(points)
wolf - 200(points)
goat - 100(points)

Pause

Escape

Fig 16: Above figure depicts the Instruction Box when we click on the Help.

Characters/Avatars: Animated agents are implemented in the game environment that follows the path assigned to them. The player can interact with these agents using the keyboard and perform actions such as giving a command to follow or stay.



Fig 17: Above figure shows the Character

Sensors: Three different types of sensors, i.e., Proximity, Time are implemented in the game environment. These sensors are used to detect the player's actions and provide a realistic experience to the players.



Fig 18: Above figure shows the sensors like Proximity and Time.

Player: A First-Person Controller is added to the game environment that allows the player to move around in the environment and interact with different objects.



Fig 19: Above figure shows the first person controller

Interface Elements: The game interface is designed with menu items such as buttons that allow the player to perform different actions such as changing weapons, pausing the game, or reloading.

START HUNTING

Start

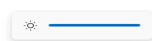


Figure20(a)

Levels

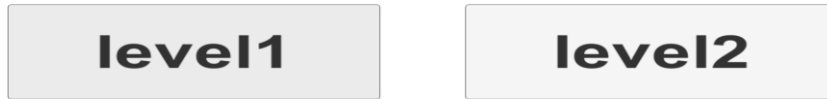


Figure20(b)

Level Finished



SCORE : 1800



Figure20(c)

GAME OVER



Figure20(d)

The Above figures 20(a),20(b),20(c),20(d) are the Interface Elements.

The importance of VR in the animal hunt:

The Animal hunt game in virtual reality is a useful application for entertainment purposes. It provides a realistic and immersive experience for the users to hunt animals in a virtual environment. Additionally, it can also be used for educational purposes to teach hunting safety and ethical practices. Virtual reality is an appropriate technology for this project as it allows users to experience a simulated environment in a more interactive and engaging way compared to traditional gaming systems. It also provides a more immersive and realistic experience, allowing users to feel like they are actually in the hunting environment.

Problems Encountered:

During the development of the Animal hunt game, several problems were encountered. One of the main issues was optimizing the game for performance and reducing the load times. This was especially challenging due to the high graphics demands of the game. Another problem was designing and implementing the AI for the animals in the game, which required extensive testing and debugging.

CONCLUSION

In conclusion, the animal hunt game is a VR application that was designed to simulate a hunting environment. The game has several features, including 3D models, textures, animations, sound, interactivity, and artificial intelligence. The project's goal was to provide an immersive and realistic hunting experience that could be used for entertainment, education, or training. The game's target audience is anyone interested in hunting, nature, or outdoor activities.

The application uses virtual reality technology, which is an appropriate tool for creating immersive experiences that cannot be replicated in the real world. VR provides users with a sense of presence and allows them to interact with virtual objects and environments.

However, some shortcomings were identified, including the limited number of animal models, and the lack of complexity in the AI's behavior. To address these issues, future work could involve adding more animals, improving the AI's behavior, and increasing the game's complexity. Overall, the animal hunt game is a useful.

FUTURE SCOPE

Multiplayer functionality: Adding a multiplayer mode to the game would allow players to compete against each other or work together to hunt animals. This would require additional programming and design work to implement, as well as consideration of network performance and stability.

Additional animals and environments: The game could be expanded with new animal species and hunting environments to keep the gameplay fresh and engaging. This would require additional 3D modeling and texturing work to create the new assets.

More complex AI behavior: The AI behavior for the animals could be made more complex and realistic, with animals responding to sounds, smells, and other environmental cues in more dynamic ways. This would require additional programming and design work to implement.

Improved user interface: The user interface for the game could be improved to make it more intuitive and user-friendly, potentially including tutorial modes or better visual feedback for player actions.

Mobile platform compatibility: The game could be ported to mobile platforms such as iOS and Android, potentially reaching a wider audience. This would require optimization of the game's performance and control scheme for touch-based inputs.

REFERENCES

Here are some general references that might be useful for a virtual reality project:

Vizard documentation: <https://docs.worldviz.com/vizard/latest/>

Unity 3D documentation: <https://docs.unity3d.com/Manual/index.html>

Google SketchUp documentation: <https://help.sketchup.com/en/sketchup>

3ds Max documentation: <https://help.autodesk.com/view/3DSMAX/2022/ENU/VRML2.0>

specification: <https://www.web3d.org/documents/specifications/14772/V2.0/>

QuickTimeVRdocumentation:

https://developer.apple.com/library/archive/documentation/QuickTime/QT7ProgOnWindows/QTQT7Prog_Win.pdf

MPEG video documentation: <https://mpeg.chiariglione.org/standards/mpeg-video>