INFO 5900 Project Report

Surf To Survive

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Abstract:

VR technology could create a truly immersive experience in a boat racing game. Unlike conventional video games, it may simulate the sensation of being on a boat and competing in water-based events. VR provides a realistic view of the ocean, boats, buoys, barriers, and spectators. It may offer a 360-degree view, enabling the player to see the game from various perspectives. The game could appeal to anyone who enjoys playing video games and is interested in boat racing. Those interested in water sports and who want to experience the rush of racing on water without being on the water may also be attracted to it. A VR boat racing game is being developed to offer a unique gaming experience. Players can feel more present and immersed in the game using VR technology, which increases player engagement and enjoyment. The software is beneficial since it gives users a fresh and thrilling perspective on boat racing. In a safe environment, you can also hone your boat racing skills. The game can also be used to promote boat racing competitions and other goods.

Conclusion: VR boat racing games have the potential to be popular and entertaining gaming experiences that appeal to a wide range of players.

Goals & Objectives:

- Make a fun boat racing game that is simple to learn but challenging to master.
- Create a physics-based boat system that is enjoyable to control and feels realistic.
- Create a visually beautiful setting that completely immerses the user in the realm of boat racing using Unity3D.
- Give players a variety of boats to choose from, each with a different set of features and handling.
- Create AI foes with varied degrees of difficulty to provide gamers with a challenging and satisfying experience.
- Create a progression system that rewards players for their accomplishments and grants access to new tracks and boats.
- Include a variety of obstacles and power-ups to give the game more variety and strategy.
- Add a score system to encourage player competition.

Environment:

A boat game in Unity3D would have an environment created to imitate the appearance and sensation of racing on various sorts of water, such as still lakes or rough oceans. For the player to have an immersive experience, realistic water physics and rendering would be necessary.

Other features of the environment that was designed be:

- Trees, mountains, or urban vistas make up the landscape and surroundings of the water.
- Different tracks with distinctive layouts and obstacles offer the player a varied and difficult experience.
- boats that can be modified to have diverse characteristics, such as handling, durability, speed, and acceleration.
- dynamic camera systems that offer various vantage points and angles while playing.
- Music and sound effects that increase the game's enthusiasm and immersion.

To give the user a fun and engaging experience, a boat game in Unity3D needs a detailed and immersive environment. Realistic physics, a variety of tracks and boats, tough AI foes, and advancement mechanisms can all come together to produce a fun and addicting gaming experience.

INTRODUCTION:

The project's objective is to create a thrilling and difficult boat racing game that offers players a compelling and immersive experience. The goal is to build a setting that mimics a real-world boat racing competition, complete with hazards, challenges, and obstacles.

The setting that is created for the boat racing game should have several components, such as:

- Water: Water features like rivers, lakes, and oceans should be included in the gaming environment. The movement of the boats should cause the water to behave realistically.

- Boats: There should be several different boats available in the game, each with its own special qualities like speed, maneuverability, and durability. Additionally, the boats should be able to be customized with different colors, upgrades, and engines.
- Obstacles: For participants to win the race, the gaming environment should contain obstacles like rocks, buoys, and other boats. To give players a demanding experience, these barriers should be positioned carefully.

- Hazards: Players must carefully navigate hazards including whirlpools, waterfalls, and rapids in the gaming environment. These dangers ought to increase the game's intensity and difficulty.

- Power-ups: For players to improve their boat's performance and overcome obstacles, the game environment needs to feature power-ups like boosters, shields, and repair kits.

Overall, with realistic physics, dynamic weather, and a range of challenges and hazards to navigate, the environment created for the boat racing game should provide players with a challenging and thrilling experience.

IMPLEMENTATION:

Vision:

A key component of the game's popularity is its visual design. With excellent texturing, lighting, and shadows, the game's aesthetics can be realistic or stylized. The visual effects, such as fog effects or water reflections, can be employed to improve the game's mood.

Sound:

The game's audio can improve the player's experience by adding background noises like seagulls or splashing water as well as sound effects for boat collisions or movement. A background track that complements the game's concept and environment may also be included.

Animations:

Animations can increase the realism and immersion of a game. Animations for character movement, boat motion, and item interaction are all possible in the game. The animations can be created manually or automatically.

Interactivity:

The game experience depends heavily on interactivity. The game may have controls for the player to operate the boat, such as buttons, levers, and switches. The game may also have non-player characters (NPCs) that the player can talk to advance the plot.

Sensors:

Sensors can increase the game's level of involvement. The game might, for instance, make use of touch screens or motion sensors to let players steer the boat or engage with the setting in novel ways. The game can also use sensors to give players feedback, such as sensations for rumbling engines or haptic feedback for collisions.

Avatar:

In a digital world, an avatar is a virtual representation of a user or a character. An avatar can be utilized in the context of a game or application to increase the user's involvement with the experience. An avatar, for instance, can represent the player in a virtual reality game's game world and enable interaction with it.

AI implementation:

By giving non-player characters (NPCs) cognitive behavior or supplying intelligent decision-making for game mechanics, artificial intelligence (AI) can be used to improve the gaming experience. AI can also be used to produce generative material, such as producing arbitrary levels for video games or developing distinctive opponent behaviors.

Interface: The user interface (UI) serves as the player's main point of contact with the game. A user interface (UI) that is well-designed can improve the player's experience and offer simple, clear controls. The UI may have several components, including buttons, menus, text, and graphics. Additionally, the UI can be made to be responsive and adaptive, adapting to the player's preferences or the context of the game.

FUNCTIONALITY:

- The player has to pass the hurdles to collect the coins.
- While after finishing the game the number of coins collected will be visible in the dashboard.
- With the increasing in the level the number of hurdles will be increased to make more challenge
- The boat was controlled via keyboard WASD keys, and the camera angle can be changed by C keyword.
- While boat touches any hurdles it loses some health
- It must complete all the checkpoints to complete the levels by collecting coins along it.

GAME PAUSED

Resume Home

LEVELS

Level 1 Level 2

These are the interface and the environment in the Project.

Here we used UNITY 3D to complete our project.

With the help of the potent Unity 3D game engine, developers can produce interactive 2D and 3D games for a range of platforms, including mobile phones, gaming consoles, and desktop PCs. Unity 3D has several important features, including:

Cross-platform development makes it simpler for developers to design games that can be played on a range of devices. Unity 3D supports a number of platforms, including iOS, Android, Windows, and MacOS.

Interface that is simple to use: Unity 3D offers a user-friendly interface that makes it simple for developers to create, edit, and test their games. Additionally, it has a large selection of features and tools that can be used to build intricate game mechanics and physics simulations.

Large developer community: The Unity 3D developer community is large and active, and it offers tools, tutorials, and help to developers that are new to the technology.

Asset shop: Unity 3D features a sizable asset store where developers may access a variety of assets, such as 3D models, textures, sound effects, and music. The ability to use these assets to swiftly create their games can save creators a ton of time and work.

Support for numerous scripting languages, such as C# and JavaScript, in Unity 3D enables programmers to build sophisticated game logic and AI.

Here is the sample codes for this game

1. Codes of the Game

BEHAVIOURS IMPLEMENTED:

❖ Player avatar: The player often controls the player's avatar, which could accelerate, steer, and brake. Numerous elements, such as wind, water temperature, and collisions with other boats or objects, can have an impact on the avatar's behavior.

- ❖ AI opponents: The user is competing against computer-controlled avatars known as AI opponents. AI opponents' actions can be designed to change according on their plan, hostility level, and skill level. For instance, a more protective AI opponent would try to avoid the player's boat while an aggressive AI opponent might try to ram it.
- ❖ Non-player characters (NPCs): NPCs can be employed to fill out the game world and offer the player extra obstacles or rewards. NPCs can act in a variety of ways, such as fighting the player, following a predetermined course, or giving out bonuses or power-ups.

- ❖ Obstacles: The player can employ obstacles, including rocks, buoys, or other boats, to add to the game's difficulty. Obstacles can be designed to react to impacts with other game objects and can behave differently depending on whether they are stationary or moving.

- ❖ Power-ups: The player can employ power-ups to grant them momentary advantages or boosts, such as better handling, invincibility, or higher speed. Power-ups can be programmed to behave in a variety of ways, including randomly appearing in the game world or being triggered by actions or events.

In a boat racing game, different agents' or avatars' behaviors can significantly impact the gameplay experience, so they must be properly planned and coded to give the user a fun and difficult experience.

The following are some uses for a boat racing game:

- ❖ Entertainment: Boat racing video games can give players a fun and interesting experience by letting them compete against human or artificial intelligence opponents and explore virtual worlds that might not be accessible in real life.

- ❖ Boat racing video games can assist players in honing a variety of abilities, including hand-eye coordination, reaction time, and strategic thinking.

- ❖ Boat racing video games can be used as a training aid for actual boat racing, allowing players to experiment with various tactics and techniques in a secure setting.

❖ Education: Players who play boat racing games can learn about various facets of boat racing, including navigation, wind and water conditions, and boat mechanics.

There are a number of reasons why virtual reality could be a suitable technology for a boat racing game, including the following:

❖ Virtual reality may offer a very immersive gaming experience that makes users feel as though they are truly in the game environment and in control of the boat. This has the potential to significantly increase the game's realism and engagement.
❖ Environments that are exceedingly realistic can be created with virtual reality, such as those with precisely reproduced water mechanics, weather, and scenery. For the gamer, this can result in a more realistic and interesting experience.

❖ Controls that are intuitive and natural: Boat racing video games can be played in virtual reality using hand gestures or handheld controllers that are intuitive and natural. As a result, players may find the game to be easier to understand and play.

❖ Virtual reality can be utilized as a training tool for boat racing, as indicated before, allowing players to practice various methods and strategies in a secure and regulated setting.

❖ Overall, virtual reality boat racing games can offer a very realistic and exciting experience, as well as possible advantages for skill improvement, training and education.

Problems Encountered:

Problems encountered while creating this project in unity is:

- Performance problems: When it comes to graphics and physics simulations, boat racing games in Unity can be resource intensive. The player's experience may be harmed by low frame rates or other performance problems in a game that has not been adequately optimized.

- Boat racing video games extensively rely on physics simulations to faithfully represent the behavior of the water, wind, and boats. Realistic physics implementation can be difficult, especially when it comes to collisions and interactions between game world items.
- AI behavior: Building believable AI foes can be difficult, especially if they must react to intricate and dynamic settings like shifting weather patterns or river currents. The AI opponents' level of difficulty must be balanced for the game to be hard without being overly frustrating for the player.

- User interface: Making a user interface that is simple to use and intuitive can be difficult, especially when it comes to steering the boat and interacting with other game world elements.

- Designing a boat racing game that is interesting and enjoyable to play might be difficult. It can be challenging to strike a balance between the difficulty level, make intriguing difficulties and impediments, and provide a sense of development.

Future Work:

- Enhanced physics simulation: To simulate the behavior of water, wind, and boats in boat racing games, physics simulations are used extensively. Simulations that are more realistic and interesting may result from improvements to Unity's physics engine.

- Support for multiplayer: By enabling players to compete against one another in real time, adding support for multiplayer might significantly improve the social side of boat racing games.

- Options for customization: Giving players the possibility to alter their characters' appearances and boats could give the game a more unique feel and enable them to show their creativity.

- Support for virtual reality: By incorporating virtual reality into boat racing games, developers might provide players with a more realistic experience that makes them feel as though they are in the boat and on the water.

- Additional game modes: Adding new game modes and challenges could give the game more variety and replay ability, retaining players' interest over time.

- A refined and professional experience may be created by upgrading the graphics and sound design of the game, which would increase players' immersion and enjoyment.

Conclusion:

Finally, a boat racing game in Unity 3D may be a fun and exciting experience for players, providing a variety of difficulties and chances for skill improvement. With realistically modeled water physics, weather, and boat mechanics, the game can be created to provide a realistic simulation of boat racing. Boat racing games can be made using the robust platform offered by Unity 3D, which gives creators access to a variety of tools and resources. However, there are several difficulties that can arise when developing a boat racing game in Unity 3D, including performance optimization, physics simulation, AI programming, user interface design, and game design.

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