EXCELSSIOR EDUCATION SOCIETY'S

K. C. COLLEGE OF ENGINEERING AND MANAGEMENT STUDIES AND RESEARCH

(Affiliated to the University of Mumbai)

Mith Bunder Road, Near Hume Pipe, Kopari, Thane(E)-400603

Department of Information Technology

Academic Year 2023-24(Even Semester)

MAJOR PROJECT PRESENTATION

SEM VIII (2023-2024)

Excelssior Education Society's
K.C. COLLEGE OF ENGINEERING & MANAGEMENT STUDIES & RESEARCH
(Affiliated to the University of Mumbai)

VR Horror Game

Group members

1) Ritvik Babre - 05
2) Hitesh Behera - 06
3) Shruti Sabbani - 50
4) Swapnil Yadav - 67

Guide Name: Asst. Prof. Punam Bagul

Index

Vision

To create IT graduates with ethical and employable skills.

Mission

- To imbibe problem solving and analytical skills through teaching learning process.
- To impart technical and managerial skills to meet the industry requirement.
- To encourage ethical and value based education.

Introduction

Virtual reality (VR) horror games offer an unparalleled immersion by leveraging first-person perspective, realistic graphics, and interactive gameplay. Players experience the game world through the eyes of the protagonist, enhancing the feeling of presence and intensifying the horror experience. Detailed environments, coupled with atmospheric lighting, create a sense of dread, while interactivity allows players to manipulate objects and solve puzzles. Jump scares are effectively utilized to startle players, taking advantage of the heightened sense of immersion in VR. Compelling narratives further engage players, drawing them deeper into the terrifying world of VR horror gaming.

VR Horror

Immersion

Promote VR

Need

Developing a VR horror game serves a dual purpose: promoting both VR technology and the horror genre, strategically targeting a diverse audience. VR technology offers an unparalleled level of immersion, transporting players into terrifying realms in a way that traditional gaming platforms cannot match. horror as a genre possesses broad appeal, VR horror game can attract both avid horror enthusiasts and newcomers, thereby expanding the reach of VR gaming. VR horror game serves as a potent demonstration of VR technology's capabilities. By showcasing how VR can deliver intense, immersive experiences that evoke strong emotional responses, this project effectively promotes VR to a wider audience, driving interest and adoption of the technology.

Why opted for Horror Genre ?

Horror genre consistently rank highly across demographics and gaming platforms, showcasing their widespread appeal and engagement. Horror games excel in delivering an immersive experience that truly transports users to another world, creating a sense of fear and suspense that showcases VR's capabilities effectively. The use of spatial audio further enhances this sense of immersion, drawing players deeper into the game environment. In India, where horror stories and supernatural themes hold cultural significance, VR horror games have the potential to resonate strongly with audiences across all demographics who are enthusiastic consumers of horror content. By leveraging the universal appeal and emotional impact of horror games, VR technology can be effectively promoted and embraced as a powerful medium for immersive experiences and storytelling in the future.

Widespread Appeal

Powerful Medium

Thrill & Adrenaline

Problem Statement

Virtual reality (VR) is an emerging technology that has the potential to revolutionize the way we interact with games and other experiences. However, VR is still relatively new and expensive, and many people lack the understanding of how it works. This limits the reach of VR technology and prevents it from becoming an integral part of our lives.

One way to introduce VR technology to a wider audience is to develop VR games. Gaming being one of the biggest industries in the world will allow VR to get a platform where it can showcase its endless possibilities to the world. Horror Games are some of the biggest games in the industry as they allow the player to get immersed with the environment. This makes the horror genre one of the best genres to showcase the capability of VR.

Expensive

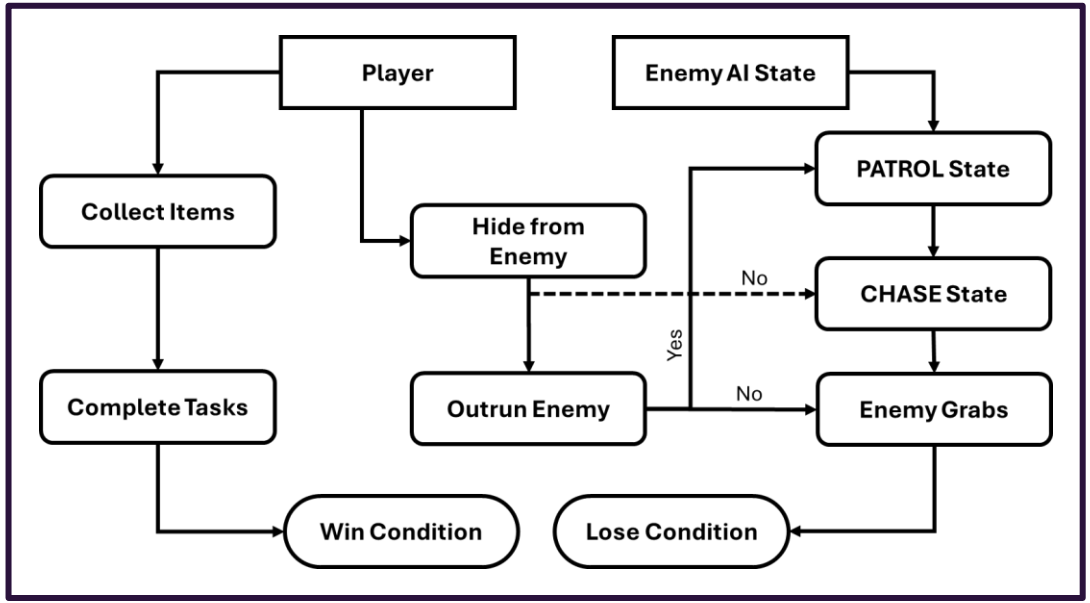
Technical Constraints

Awareness & Education

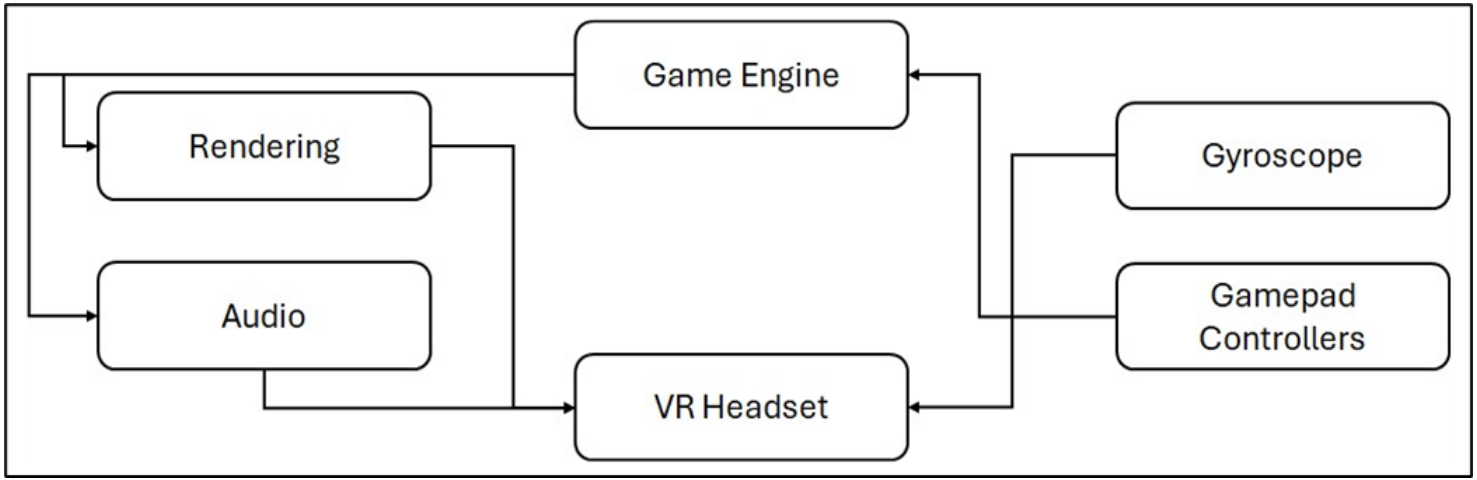
Literature Survey

Sr. No.	Title	Authors	Methodology	Advantages	Results
1	Virtual Reality Horror Games and Fear in Gaming (2023)	Tammy Jin-Hsuan Lin	-Evolutionary mechanism, -Excitation transfer theory and model of suspense -Three-factor model	-Immersion in VR -Audience Experience -Valueable insights to human behaviour and emotions -Interactive Storytelling	-Deeper understanding of human behavior & media effects -Helps address various phobias
2	Research on the Application of VR in Games (2023)	Shijie Bian	-Appliaction of VR in Horror, Role-Playing and Rhythmic games	-Strong sense of immersion -Realistic environments and gaming experience -Enhanced fun and entertainment	-Scope of VR -Future Gaming experience -Evolution of VR in Games
3	Research on the Progress of VR in Game (2023)	Ruiqi Zhang	-Application in VR in Action Simulation, Education, Scenario experienced Games	-Enhanced gaming experience -Improved teaching -Enhanced Immersion	-Strong Game Immersion -Real time human- machine interaction -Analysis of trends and characteristics

Algorithm


Player
Enemy AI State
PATROL State
Collect Items
Hide from Enemy
No
CHASE State
Yes
Complete Tasks
Outrun Enemy
No
Enemy Grabs
Win Condition
Lose Condition

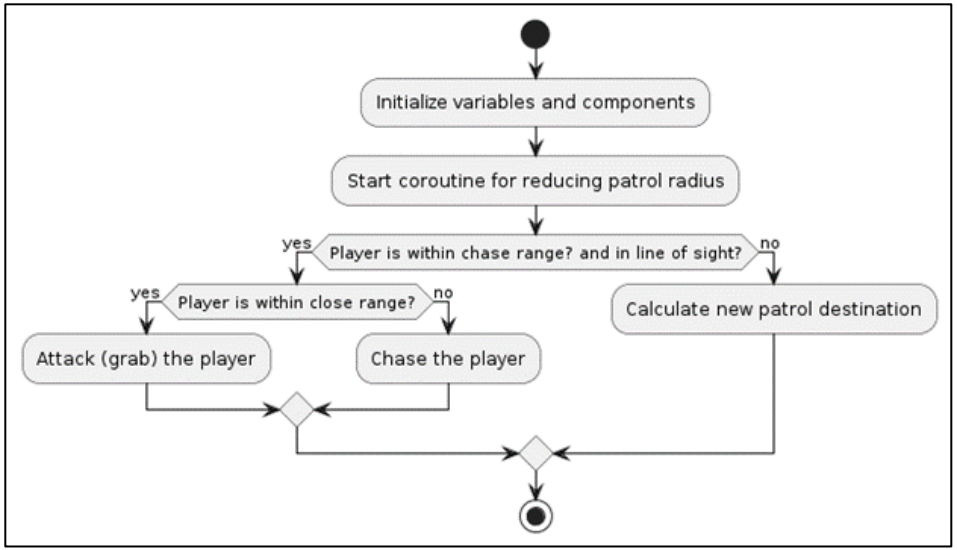
Architecture

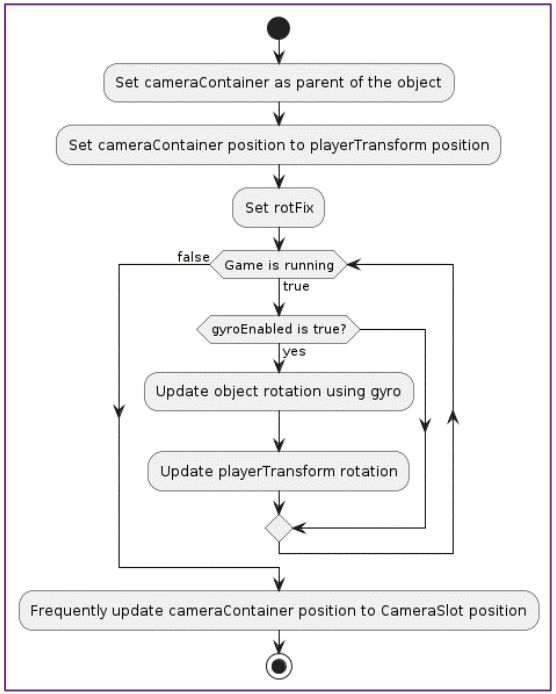


Hardware & Software Requirements

Hardware	Software
Android device	Google cardboard SDK
Gyroscope	Game Engine - Unity
Gamepad Controller	Version Control System - GitHub
VR Headset	Scripting Language – C#
	IDE – Visual Studio

Flowchart


Initialize variables and components
Start coroutine for reducing patrol radius
yes
Player is within chase range? and in line of sight?
no
yes
Player is within close range?
no
Calculate new patrol destination
Attack (grab) the player
Chase the player


Set cameraContainer as parent of the object
Set cameraContainer position to playerTransform position
Set rotFix
false
Game is running
true
gyroEnabled is true?
yes
Update object rotation using gyro
Update playerTransform rotation
Frequently update cameraContainer position to CameraSlot position

Feasibility Study

Market Analysis:

- Demographics
- Market Demand
- Market Trends
- Budget Power

Technical Feasibility:

- High Computational Power
- Rendering
- Power Usage

Financial Feasibility:

- Hardware Cost
- Entry Cost
- Spending Power

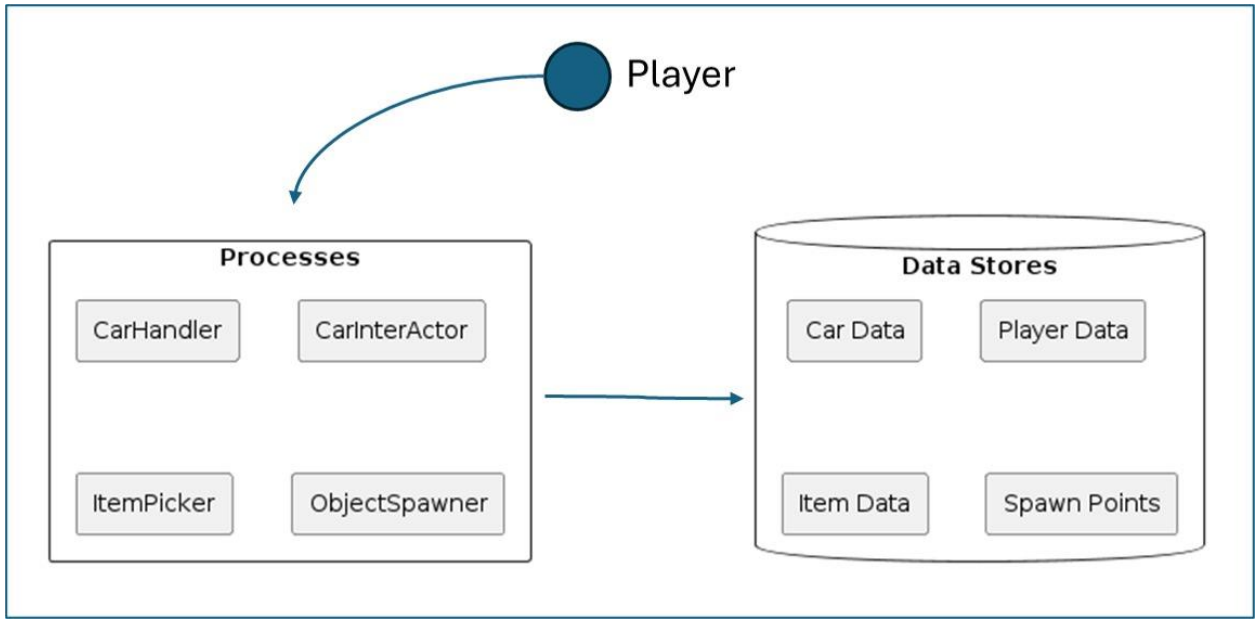
Legal Considerations:

- Copyrights

Proposed Methodology

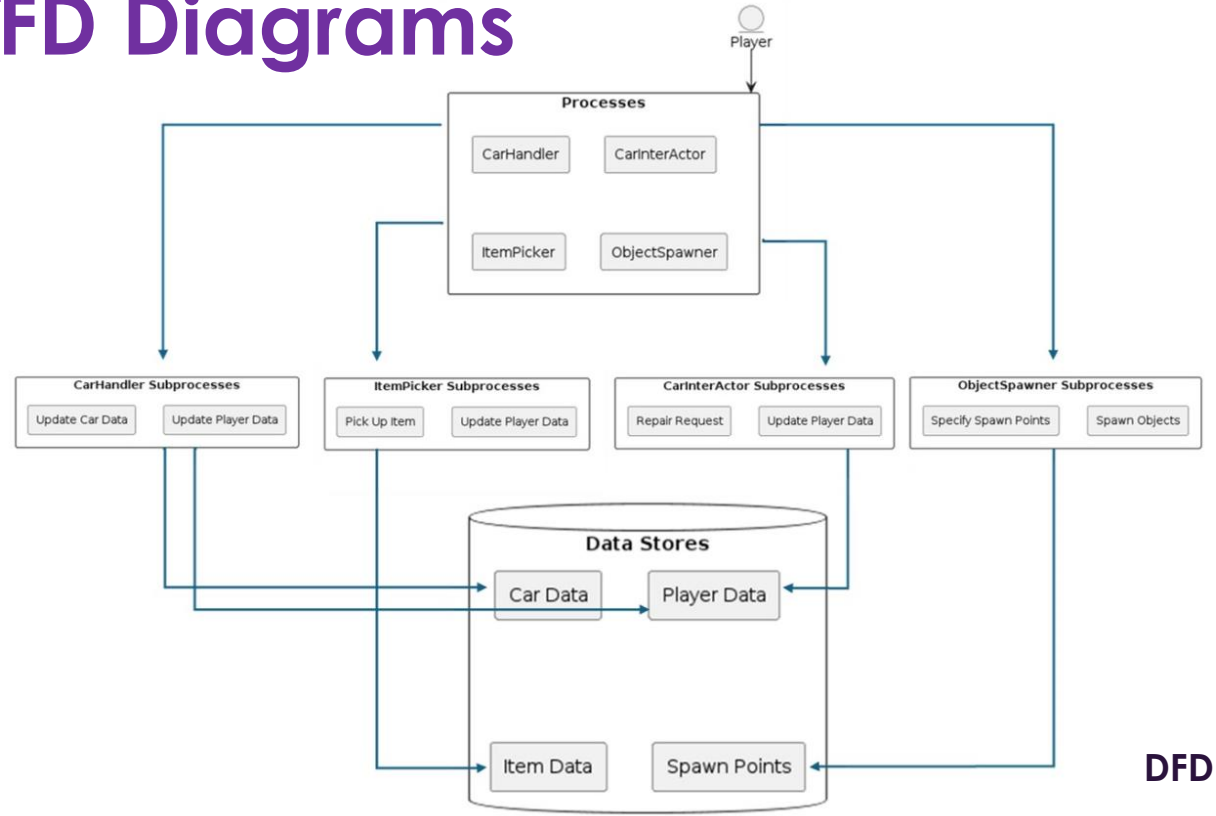
The VR horror game incorporates essential features to deliver an immersive experience. Player collects items crucial for progression while evading relentless AI Enemy, heightening the terror. Leveraging the Google Cardboard SDK, it offers immersive VR experiences on Android devices, aided by the Gyroscope tracking head movements. The Game Manager synchronizes elements for a cohesive experience, overseeing states, UI, and win-loss conditions. An Item Spawner algorithm enhances replay-ability by randomly placing items. Audio Management adds to the atmosphere with 3D spatial sounds. VR-friendly UI elements aid interaction. Victory entails completing tasks and escaping enemies, while failure comes with capture. Together, these elements create an intense and immersive horror game.

DFD Diagrams



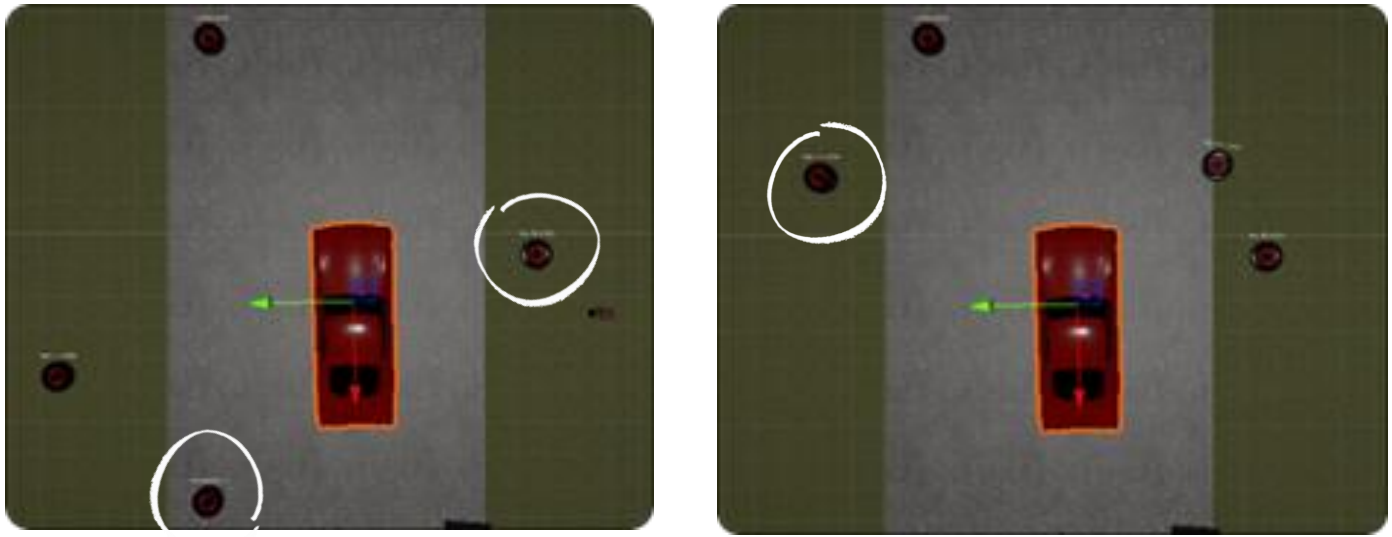
DFD Level: 0

DFD Diagrams



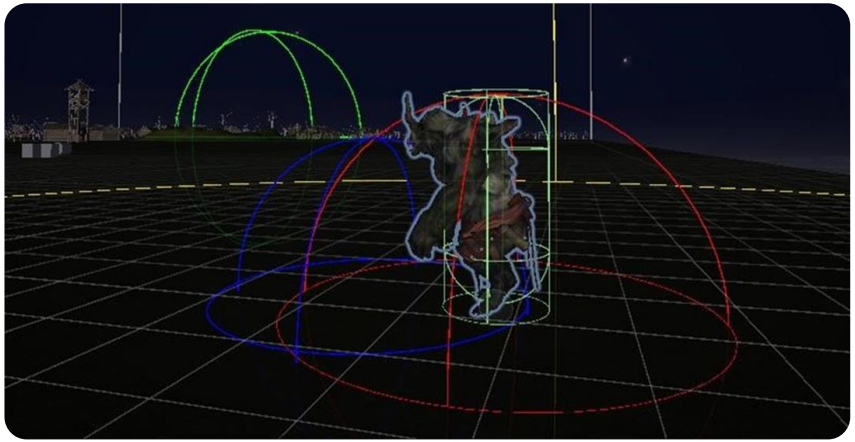
DFD Level: 1

Implementation Details

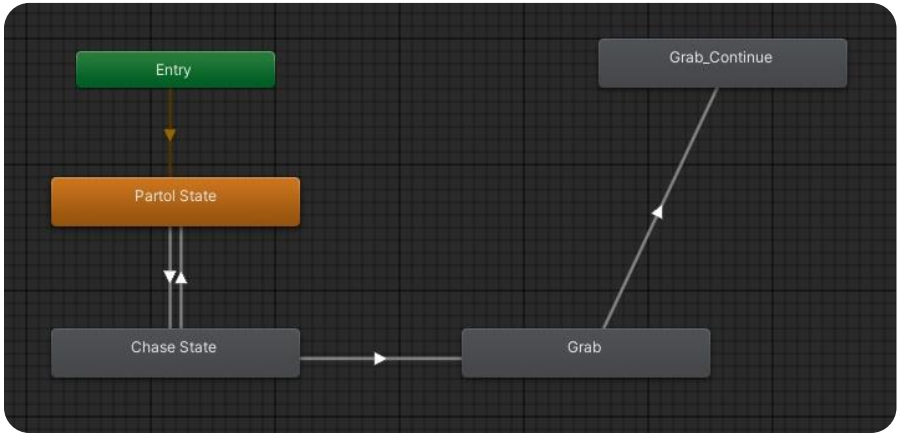


Item spawn at Random Spots in every instance

Implementation Details



Enemy in PATROL State

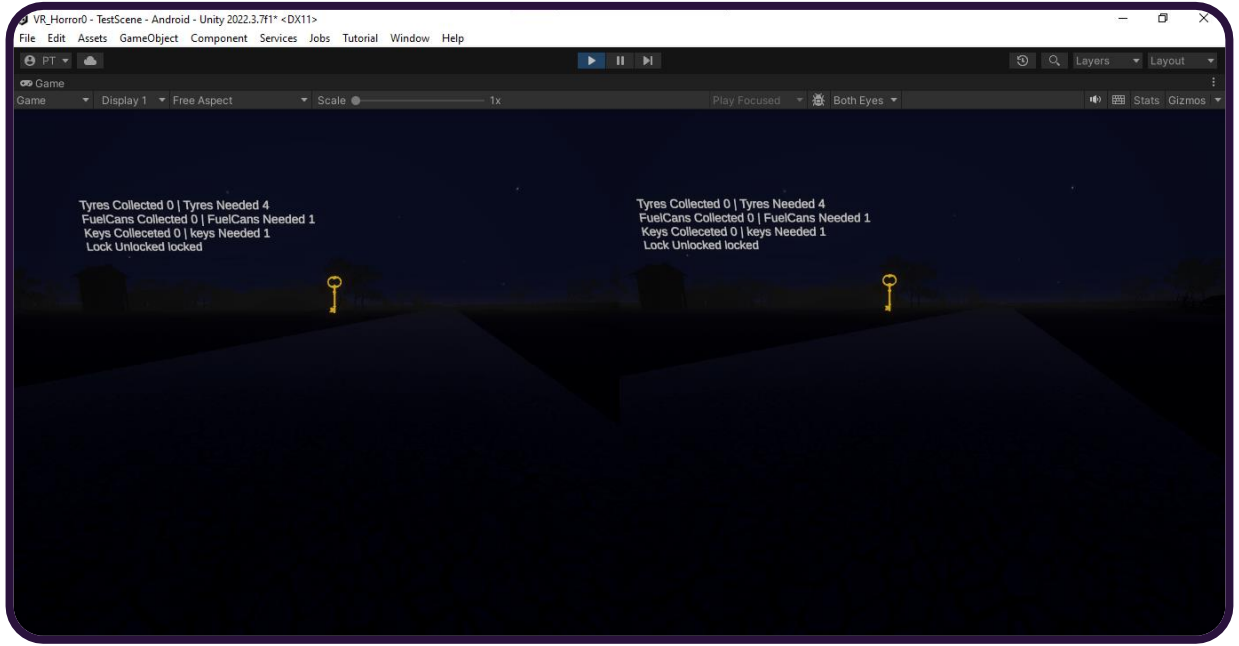


Enemy <Animator> Component

Wireframe spheres:

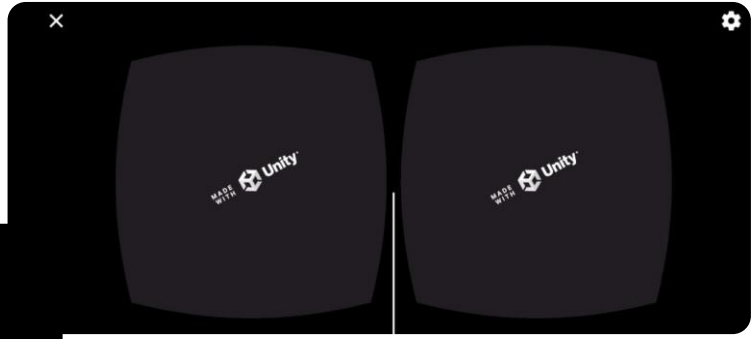
yellow : area within which the enemy will start chasing the player.
red : area within which the enemy will attempt to attack or grab the player.
green : area within which the enemy will patrol randomly when not chasing the player.
blue : area within which the enemy can grab the player if the player is close enough.

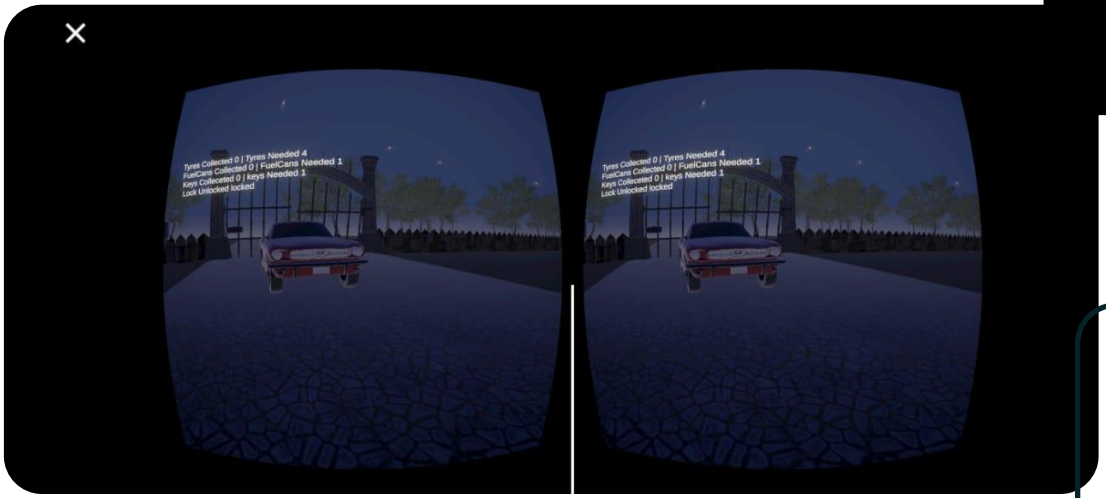
Implementation



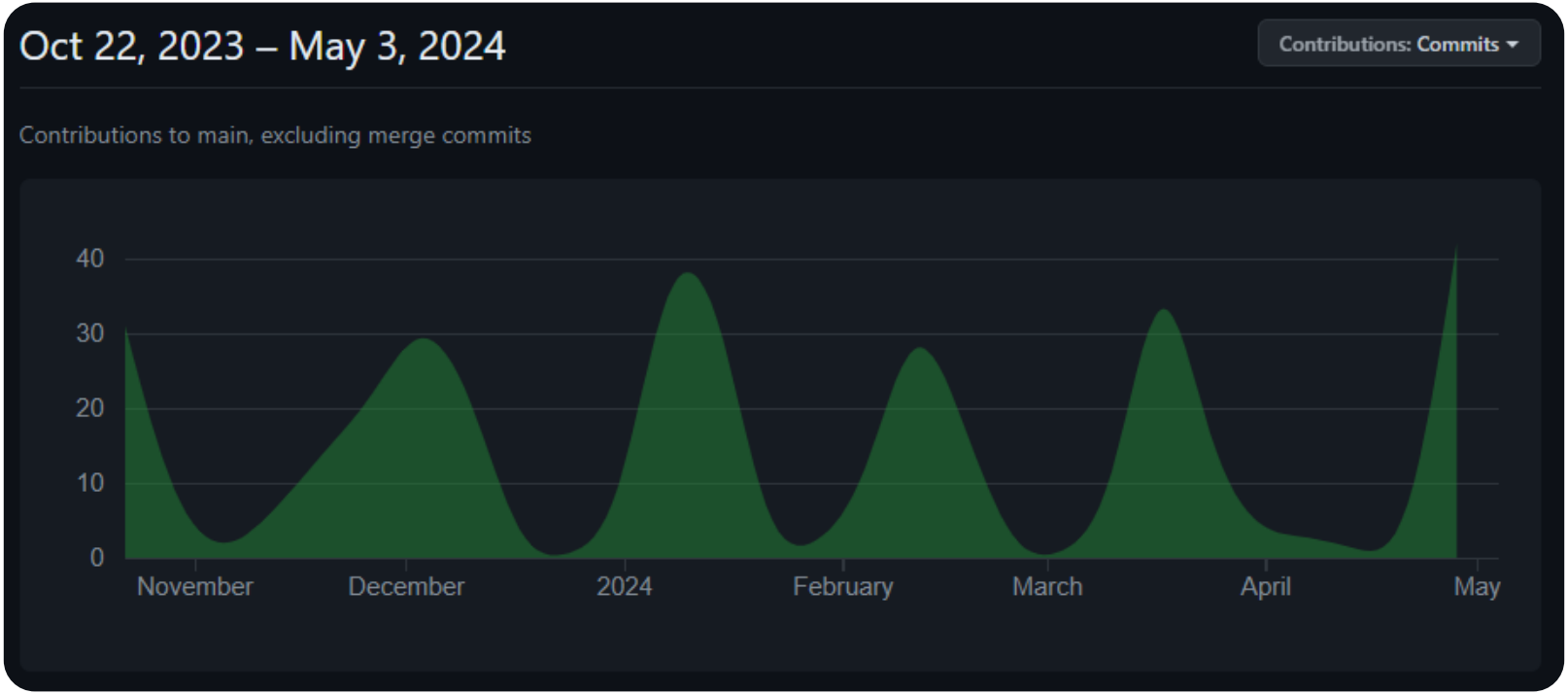
Stereoscopic view with **MockHMD** in **Unity**

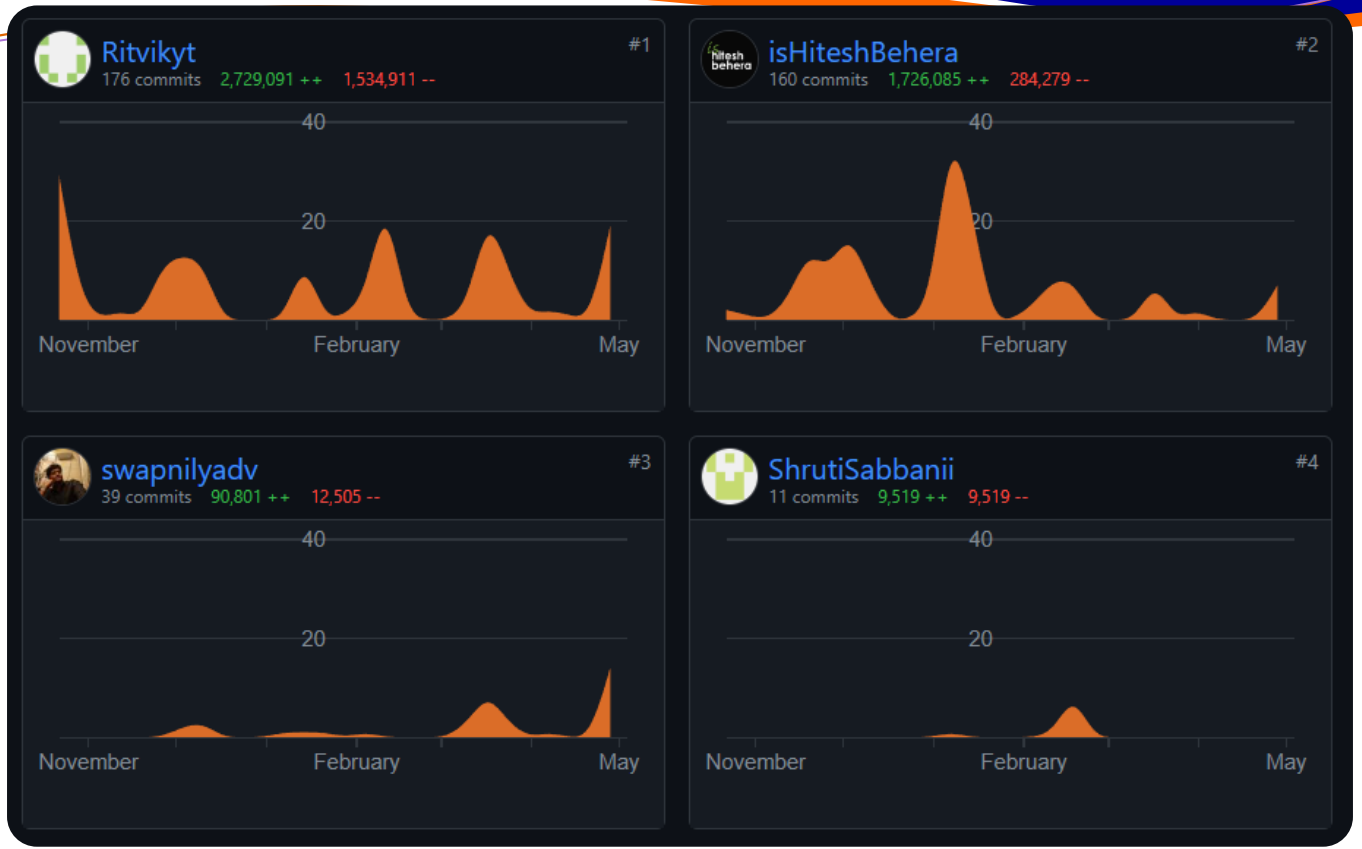
Implementation





Stereoscopic view achieved with **Google Cardboard** in **Android** device


Oct 22, 2023 – May 3, 2024
Contributions: Commits
Contributions to main, excluding merge commits
40
30
20
10
0
November
December
2024
February
March
April
May


Ritvikyt
#1
176 commits 2,729,091 ++ 1,534,911 --
40
20
November
February
May
isHiteshBehera
#2
160 commits 1,726,085 ++ 284,279 --
40
20
November
February
May
swapnilyadv
#3
39 commits 90,801 ++ 12,505 --
40
20
November
February
May
ShrutiSabbanii
#4
11 commits 9,519 ++ 9,519 --
40
20
November
February
May

Conclusion

Our VR horror game incorporates a holistic approach to gaming, seamlessly blending immersive environments with advanced technology while catering to the traditional enthusiasm for consuming horror stories. It represents a fusion of past, present, and future elements, presenting VR seamlessly into daily life experiences. Adhering to VR rules and integrating cohesive features, our game sets a new standard for immersive entertainment.

Introducing Interactive Computing

Integration into day-to-day life

Blending past-present-future

References

1. Ntokos, Konstantinos. *"Level of fear"*: Analysis of fear spectrum into a tool to support horror game design for immersion and fear." An International Journal (CGDEIJ) 1, no. 33-43 (2018).
2. Årnell, Tobias, and Nikola Stojanovic. *"Horror game design–what instills fear in the player?:* A study on the effects of horror game design theories and level design patterns on player behaviour in a horror environment." (2020).
3. Zhang, Ziwen. "Analysis of the design aesthetics and player emotions of horror games: Take 'Little Nightmares' as a case." (2022).
4. de Lima, Edirlei Soares, Bruno MC Silva, and Gabriel Teixeira Galam. "Adaptive virtual reality horror games based on Machine learning and player modeling." Entertainment Computing 43 (2022): 100515.
5. Lin, Jih-Hsuan Tammy, Dai-Yun Wu, and Chen-Chao Tao. "So scary, yet so fun: The role of self-efficacy in enjoyment of a virtual reality horror game." New Media & Society 20, no. 9 (2018): 3223-3242.
6. Lin, Tammy Jin-Hsuan. "Virtual Reality Horror Games and Fear in Gaming." In Oxford Research Encyclopaedia of Communication. 2023.
7. Bian, Shijie. "Research on the Application of VR in Games." Highlights in Science, Engineering and Technology 39 (2023): 389-394.
8. Zhang, Ruiqi. "Research on the Progress of VR in Game." Highlights in Science, Engineering and Technology 39 (2023): 103-110.

Thank You!!!