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A Real-time AR-VR sword fighting simulator (an arena gameplay- survival game)

Ruchi Vyas[1], Vinay[2], Nagendra[3], Himakshi[4], Dr. Mayank Patel[5]

Assistant Professor, CSE, Geetanjali Institute of Technical Studies[1]

UG Scholar, CSE, Geetanjali Institute of Technical Studies[2,3,4]

Professor, CSE, Geetanjali Institute of Technical Studies[5]

Abstract: In this paper, we embark on a journey to explore the intricate development and implementation of an augmented reality-virtual reality (AR-VR) survival gameplay experience set within a dynamic circular arena. By leveraging cutting-edge technologies and innovative game design principles, we aim to redefine the boundaries of immersion and engagement in gaming. Through a comprehensive examination of the game's design, mechanics, technology integration, and potential impact on the gaming industry, this paper offers insights into the evolving landscape of immersive entertainment.

Keywords: AR-VR, Gameplay, Survival, Circular Arena, Immersive Experience.

I. INTRODUCTION

The gaming industry is undergoing a profound transformation, driven by advancements in technology and an increasing demand for immersive experiences. This paper introduces a groundbreaking project that combines the immersive capabilities of augmented reality (AR) and virtual reality (VR) to create a dynamic survival gameplay experience. Set within a circular arena, players are thrust into a relentless battle against respawning enemies, challenging their skills, reflexes, and strategic thinking. By pushing the boundaries of technology and creativity, this project aims to deliver a gaming experience that captivates players and sets new standards for immersion and engagement.

II. LITERATURE REVIEW

The foundation of this project is built upon a thorough review of existing literature in the fields of AR-VR gaming, survival gameplay mechanics, and immersive environments. Previous studies have highlighted the potential of AR and VR technologies to create captivating gaming experiences that blur the lines between the virtual and real worlds.

Additionally, research on survival gameplay mechanics has demonstrated the effectiveness of dynamic challenges, such as respawning enemies, in enhancing player engagement and immersion. By synthesizing insights from these diverse areas of study, this project seeks to leverage the strengths of each to craft a truly compelling gaming experience.

III. PROBLEM STATEMENT

The modern era witnesses a surge in the craving for immersive escapism, where individuals seek solace from the mundane through virtual adventures. Among these desires, there exists a prevalent yearning to inhabit the persona of a swordsman, to wield a blade with mastery, and traverse fantastical realms in epic battles. However, current solutions fail to fully realize these aspirations, offering mere glimpses of immersion and leaving users disenchanted with shallow experiences.

Users lament the lack of depth and realism in existing virtual swordsmanship simulations, which often feel detached and unfulfilling. The desire to be transported into a truly immersive world, where every swing of the sword resonates with tangible weight and consequence, remains unmet. Moreover, the absence of seamless integration between the physical and virtual realms inhibits users from fully embodying their chosen role, detracting from the overall immersion and satisfaction of the experience.

Hence, there is an urgent need for a solution that transcends the limitations of current technologies, offering users a truly immersive and empowering journey into the world of swordsmanship. This solution must seamlessly blend virtual and physical elements, providing users with an authentic and transformative experience that fulfills their deepest desires and transports them into a new realm of adventure and discovery.

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IV. REQUIREMENTS

- Required Hardware components

1. Processor – Intel i5, equivalent or greater
2. Graphic Ram – NVidia gta 970 or greater
3. 8gb ram
4. Oculus quest 2 or HTC vive

- Required Software:

1. Unity 3d
2. Blender 3d
3. Adobe Substance Painter
4. Marvelous Designer
5. FL studio
6. Zbrush

- Technologies:

1. Unity
2. VR
3. 3d modeling and texturing

V. METHODOLOGY

1. **Game Design:** The core of the project revolves around designing a circular arena environment that is visually stunning and conducive to intense gameplay. This includes conceptualizing the arena layout, enemy placement, and environmental elements.

2. **AR-VR Integration:** AR technology overlays virtual elements onto the player's real-world environment, while VR technology transports players into a fully immersive virtual space. Integration of these technologies requires careful consideration of hardware compatibility, tracking systems, and user interface design.

3. **Enemy Respawning:** A sophisticated respawn system is implemented to ensure that enemies continuously pose a threat to the player. This involves designing AI algorithms to control enemy behavior, managing spawn points, and adjusting difficulty dynamically based on player performance.

4. **Player Interaction:** Players interact with the game using motion controllers or gestures, allowing for intuitive navigation and combat mechanics. User interface design plays a crucial role in facilitating seamless interaction and providing feedback to the player.

5. **Scoring System:** A robust scoring system tracks the player's survival time, providing feedback and incentives for prolonged gameplay sessions. This includes leaderboard integration, achievement systems, and rewards for achieving milestones.

VI. RESULTS

The culmination of extensive development efforts is a gaming experience that transcends traditional boundaries, offering players an adrenaline-fueled journey into the heart of immersive entertainment. The seamless integration of AR and VR technologies creates a sense of presence and immersion that is unparalleled in the gaming landscape. The dynamic nature of the circular arena and the relentless onslaught of respawning enemies keep players on the edge of their seats, challenging them to push their limits and test their skills. Early user testing and feedback have been overwhelmingly positive, highlighting the potential of this project to leave a lasting impact on the gaming industry.

VII. CONCLUSION & FUTURE SCOPE

In conclusion, the AR-VR survival gameplay experience represents a significant milestone in the evolution of immersive entertainment. By harnessing the power of cutting-edge technologies and innovative game design principles, this project has created a gaming experience that captivates players and pushes the boundaries of immersion and engagement. As technology continues to advance and evolve, the potential for AR-VR gaming to revolutionize the entertainment industry is limitless. By embracing creativity, innovation, and collaboration, developers can continue to redefine the gaming landscape and inspire players worldwide.

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Use- case diagram

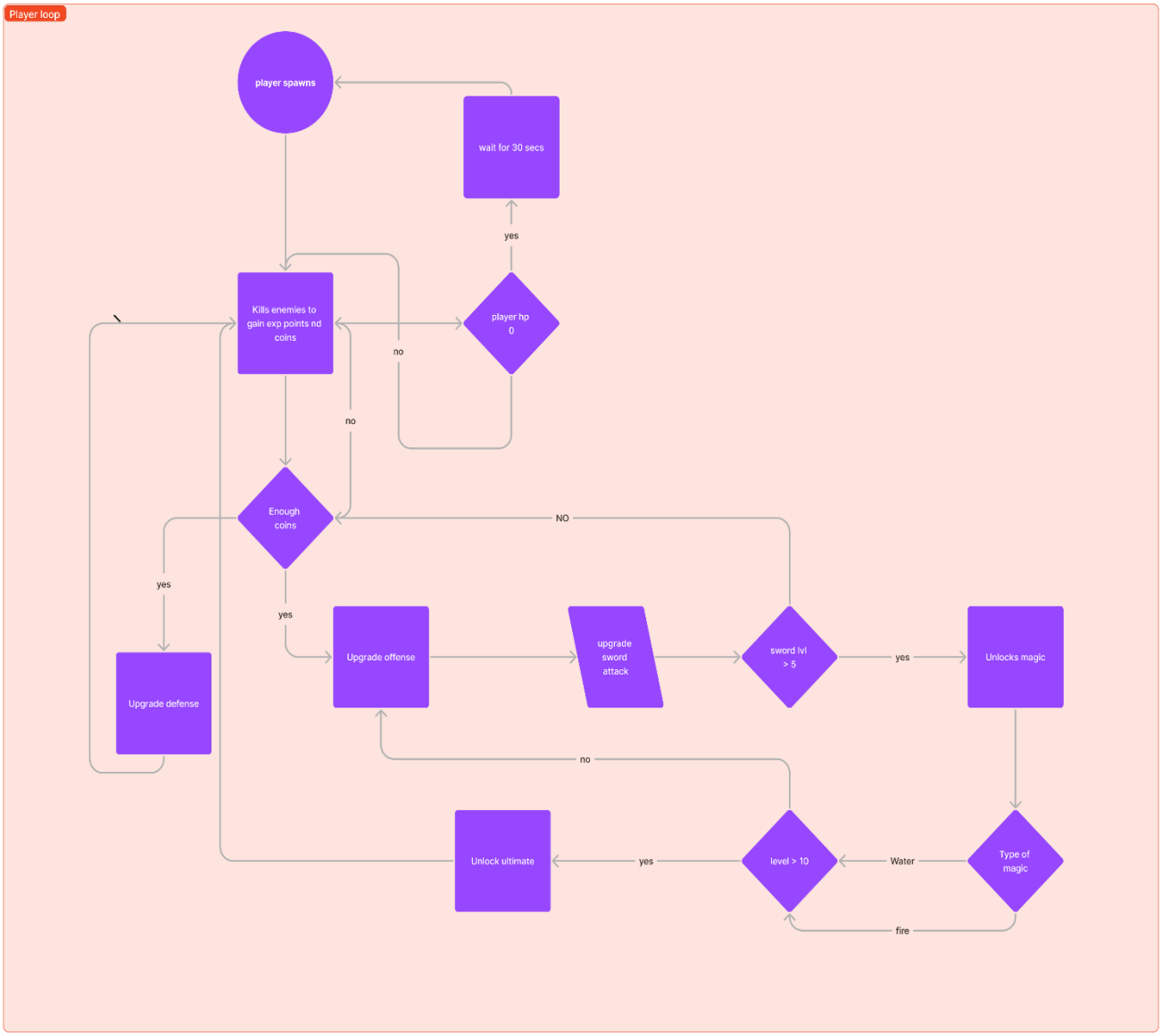

Fig. 1 Player loop

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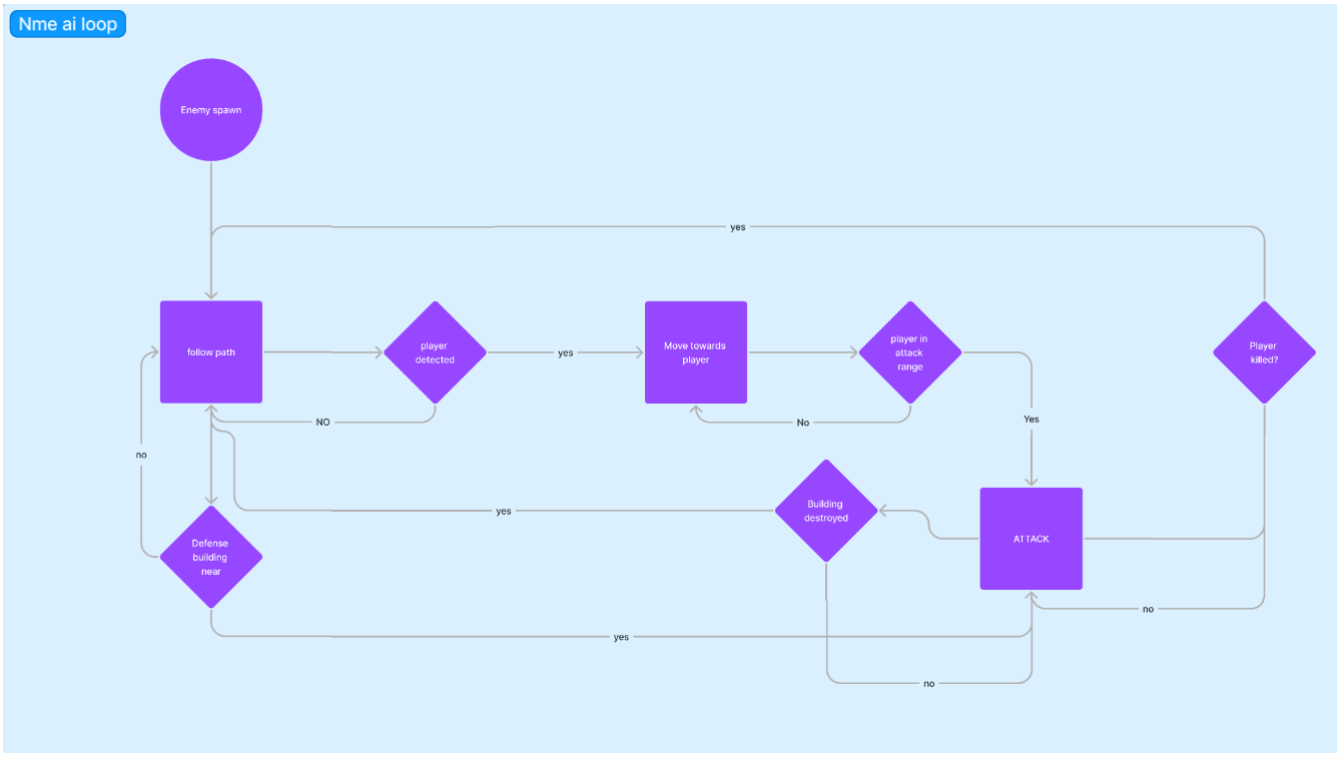

Fig. 2 Class Diagram

Fig. 3 Gameplay Loop

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Project Screenshots

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