

VIRTUAL REALITY IN ANDROID GAMING

Abhilash G. Joshi¹, Ashwini S.Dabhade², Ashwini S.Borse³

¹²³ BE, Department of Computer Engineering, GESRHSCOE, Nashik, Maharashtra, India

Abstract – In today's scenario, Virtual Reality which can be referred to as immersive multimedia or computer simulated life, replicates an environment that simulates physical presence in places in the real world or imagined worlds and lets the user interact in that world. Virtual reality artificially creates sensory experiences, which can include sight, hearing, touch, smell, and taste. Virtual reality gaming is where a person can experiences being in three dimensional environment and interact with that environment during a game. Based on Virtual Reality (VR) technology, we provide a more interesting and convenient way for people to play virtual reality game on Google Cardboard. In this project, we propose a Virtual Reality in Gaming for on Android platform through Google Card board (Wearable Device). The game is rendered when player aims using his/her eye sight at the specific marker. The players can view the virtual scenario through the lenses of Google Cardboard. Player moves the device to control the game. The experiment results show that the proposed game system can work effectively and provide winner result to the player.

Key Words: Virtual Reality, 3-D game, Google Cardboard, Android Device.

1. INTRODUCTION

The purpose of our project is to design and implement a 3-D game system in Virtual Reality using Google Cardboard game, which intended to replace the real world environment with the digital one and the human senses are immersed in the virtual environment. Based on Virtual Reality environment, the players may need to use their phones as well as wearable device to view the virtual world. Player only has to put android device in Cardboard and play the game.

Our main goal is to improve immersion in shooter games, which are already known to be immersive especially amongst young generation. However, and due to time constrains, equipment availability and other limitations, this project turns out to be more like an exploration of possibilities and a challenge to difficulties in order to reach such a goal. In a matter of fact, the game play scenario was not our major concern. On this project we focused on finding a way to develop a virtual reality system, and on to learn how to solve problems in this field.

1.1 MOTIVATION

Motivations Real world and computer games have their own distinct strengths. By allowing us to combine these strengths, we can use VR to improve existing game styles and produce new ones. For discussion, we consider a player's gaming experience as consisting of four parts; physical, social, mental and emotional. Research into VR gaming serves another purpose beyond the improvement of gaming styles and the development of new ones, as gaming environments are well suited for exploratory research. In this section we examine the strengths of real world and computer games, the role of VR in combining and extending them, and the value of gaming as an exploratory research area. We strongly believe that Virtual Reality is a promising idea, which can enhance the player's gaming experience by providing exciting new ways to control their actions, through motions and 3D movement.



Fig -1: Requirements of gaming application

1.2 LITRATURE SURVEY

Primitive Game Engines:

Before game engines, games were typically written as singular entities: a game for the Atari 2600, for example, had to be designed from the bottom up to make optimal use of the display hardware this core display routine is today called the kernel by retro developers. Other platforms had more leeway, but even when the display was not a concern, memory constraints usually sabotaged attempts to create the data-heavy design that an engine needs. Even on more accommodating platforms, very little could be reused between games. The rapid advance of arcade hardware which was the leading edge of the market at the time meant that most of the code would have to be thrown out afterwards anyway, as later generations of games would use completely different game designs that took advantage of extra resources. Thus most game designs through the 1980s were designed through a hard-coded rule set with a small number of levels and graphics data. Since the golden age of arcade video games, it became common for video game companies to develop in-house game engines for use with first-party software.

While third-party game engines were not common up until the rise of 3D computer graphics in the 1990s, there were several 2D game creation systems produced in the 1980s for independent video game development. These include Pinball Construction Set (1983), ASCII's War Game Construction Kit (1983), Thunder Force Construction (1984), Adventure Construction Set (1984), Garry Kitchen's GameMaker (1985), Wargame Construction Set (1986), Shoot'Em-Up Construction Kit (1987), Arcade Game Construction Kit(1988), and most popularly ASCII's RPG Maker engines from 1988 onwards.

The term "game engine" arose in the mid-1990s, especially in connection with 3D games such as first-person shooters (FPS). (See also: first-person shooter engine.) Such was the popularity of Id Software's Doom and Quake games that, rather than work from scratch, other developers licensed the core portions of the software and designed their own

graphics, characters, weapons and levels—the "game content" or "game assets." Separation of game-specific rules and data from basic concepts like collision detection and game entity meant that teams could grow and specialize.

Later games, such as id Software's Quake III Arena and Games' 1998 Unreal were designed with this approach in mind, with the engine and content developed separately. The practice of licensing such technology has proved to be a useful auxiliary revenue stream for some game developers, as a one license for a high-end commercial game engine can range from US\$10,000 to millions of dollars, and the number of licensees can reach several dozen companies, as seen with the Unreal Engine. At the very least, reusable engines make developing game sequels faster and easier, which is a valuable advantage in the competitive video game industry. While there was a strong rivalry between Epic and id around 2000, since then Epic's Unreal Engine has been far more popular than id Tech 4.

Modern game engines are some of the most complex applications written, often featuring dozens of finely tuned systems interacting to ensure a precisely controlled user experience. The continued evolution of game engines has created a strong separation between rendering, scripting, artwork, and level design. It is now common, for example, for a typical game development team to have several times as many artists as actual programmers.

First-person shooter games remain the predominant users of third-party game engines, but they are now also being used in other genres. For example, the role-playing video game The Elder Scrolls III: Morrowind and the MMORPG Dark Age of Camelot are based on the Gamebryo engine, and the MMORPG Lineage II is based on the Unreal Engine. Game engines are used for games originally developed for home consoles as well; for example, the RenderWare engine is used in the Grand Theft Auto and Burnout franchises.

Although the term was first used in the 1990s, there are a few earlier systems in the 1980s that are also considered to be game engines, such as Sierra's Adventure Game Interpreter (AGI) and SCI systems, LucasArts' SCUMM system and Incentive Software's Freescape engine. Unlike most modern game engines, these game engines were never used in any third-party products (except for the SCUMM system which was licensed to and used by Humongous Entertainment).

Unity Survey Area:

3 Key points for each engine

1. Usability (UI, how easy it was to learn and develop with)
2. Functionality (what exactly the engine can do)
3. Price point (speaks for itself)

PROPERTIES	UNITY	UNREAL ENGINE 4	GAME MAKER	CONSTRUCT 2	FLASH PRO	GAME SALAD
FULL 3D SUPPORT	YES	YES	NO	NO	NO	NO
FULL 2D SUPPORT	YES	NO	YES	YES	YES	YES
FREE VERSION	YES	NO	YES	YES	YES	YES
PAID VERSION	YES	YES	YES	YES	YES	YES
PC EXPORT	YES	YES	YES	YES	YES	YES
PLAY STATION EXPORT	YES	YES	YES	NO	NO	NO
XBOX EXPORT	YES	YES	NO	NO	NO	NO
NINETENDO EXPORT	YES	NO	NO	NO	NO	NO
IOS	YES	YES	YES	YES	NO	YES
ANDROID	YES	YES	YES	YES	NO	YES
WPS	YES	YES	YES	YES	NO	YES
MAC	YES	YES	YES	YES	YES	YES
HTML5	NO	NO	YES	YES	NO	YES
AVAILABLE ON MAC OS	YES	YES	YES	NO	YES	YES
AVAILABLE ON WINDOWS	YES	YES	YES	YES	YES	YES

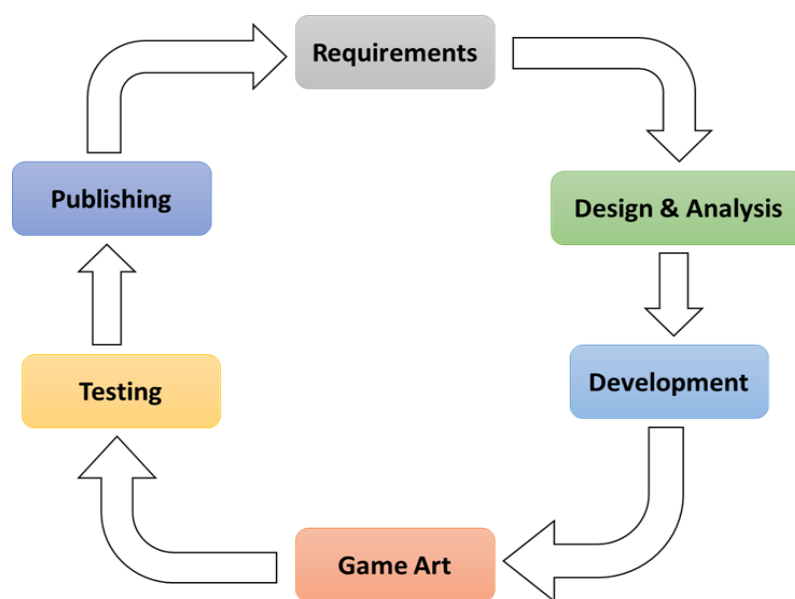
Table 1 : Unity Survey Area

2. PROPOSED SYSTEM

In our project we proposed a game system which can be played by two ways:

1. Endless game- After selecting the endless game player gets started with his game. Player has to fight with the enemies to finish the game. As the game is endless therefore there will be no as such a finish for the game. Player have to earn more and more points to increase his level. After getting increasing level game difficulty will increase and also player will be having advance weapons and different spaceships to fight with.

2. Level based game- Level based game will be divided into some number of levels. After completing one level player will get next level unlocked also his power will be more. But the difficulty level will be increasing as player gets into next levels. This game will end after completing the level and finish point for the game will be after completing all the levels



3. COMPONENTS

1. Gyroscope:

Gyroscope is the inbuilt function in the android or iOS devices. It is used for the rotation of the view in the screen in 360 degree rotation. The working of Gyroscope is as shown in the figure. By using the Gyroscope player can see in every direction i. e. Life, Right, Up, Down, Front and Back. A gyroscope is a device that uses Earth's gravity to help determine orientation. Its design consists of a freely-rotating disk called a rotor, mounted onto a spinning axis in the center of a larger and more stable wheel. As the axis turns, the rotor remains stationary to indicate the central gravitational pull, and thus which way is "down."The gyroscope maintains its level of effectiveness by being able to measure the rate of rotation around a particular axis. When gauging the rate of rotation around the roll axis of an aircraft, it identifies an actual value until the object stabilizes out. Using the key principles of angular momentum, the gyroscope helps indicate orientation. In comparison, the accelerometer measures linear acceleration based on vibration.

2. Skybox:

Skybox is the mechanism for applying effect to the game surrounding. there are various types of skybox which contains the Dawn effect, Eric effect, Moonshine effect, Overcast Effect, Starry Night effect, Sunny effect. A skybox is a method of creating backgrounds to make a computer and video games level look bigger than it really is. When a skybox is used, the level is enclosed in a cuboid. The sky, distant mountains, distant buildings, and other unreachable objects are projected onto the cube's faces (using a technique called cube mapping), thus creating the illusion of distant three-dimensional surroundings.

3. Random Generation of Different Objects:

The generation of the object using random spawning is carried by using the C script. Using this script the number of the generated object and its generation speed is maintained.

4. Target Image View with Camera:

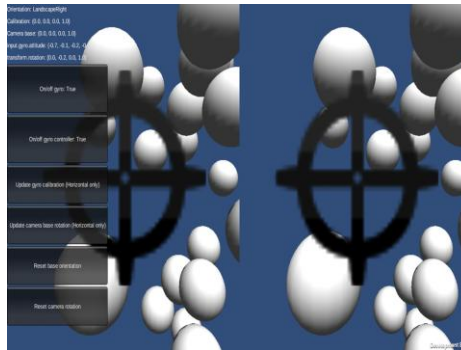
Target image view is the marker used for targeting the object and destroying them. This target destroys the object.

5. Object Destroy on Sight Shoot:

A cube collider of specific size is attached to the target and is made invisible using Mesh Renderer. When the object come into the range of the collider it appears in front of the target then it gets destroyed.

6. Cardboard Screen Divide: Cardboard screen Divide is the mechanism done

using adjustment of the size of the camera or by applying the Cardboard API which splits the main camera into two consecutive cameras.



4. CONCLUSIONS

In this project, we have presented a 3D game system based on Virtual Reality technology. In this game, we combine the advantages of both wearable device supported game and traditional smartphone online games. We implement the game system through an application on Android platform. To illustrate the effectiveness of the system, we adopt Unity Framework. We also conduct several experiments to evaluate our application. The experimental results show that our developed system can work effectively on android devices with wearable Device (Google Cardboard). Friendly user interface is very important for an application. Most of people decide whether to use an application only by its user interface. Thus, the 3D virtual Environment looked more real. Moreover, although the game system can show fantastic virtual game scenario, the improvement of accuracy and sensitivity of the system is still needed.

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