ORIGIN OF GAMING IN VIRTUAL REALITY

Debjyoti Das Adhikary¹, Proff. Ashish Maheta²
¹B. TECH, Computer Engineering Department, Indus University
²Assistant Professor, Computer Engineering Department, Indus University

ABSTRACT - Today, with the virtual gaming industry evolving at such a high rate and making a huge place for itself in the market, gaming companies are looking for new ways to improve the gaming experience for the consumer. After revolutionary ideas like 3-D gaming, motion gaming, this industry finally emerged with one of the revolutionary idea, Virtual Reality Gaming. While 3-D gaming tries to bring video games to life by getting them in user environment, motion gaming on the other hand tries to makes the gaming experience more interactive by using player motions as an input. V.R. Game on the other hand, immerses the player inside the game environment in such a way that user can interact with the virtual environment. This paper surveys the evolution of Video Gaming as well as Virtual Reality and how these two worlds met to give birth to Virtual Reality Gaming. Then we focus on the modern day consoles and hardware required for VR Gaming, and how feasible are they to that of the current classical Gaming consoles.

KEYWORDS-Virtual Reality (VR), Video Game (VG), Head Mounted Display (HMD),

I. INTRODUCTION

Since, its very origin VR has shared a lot of characteristics similar to VGs, both these industries has user experience as there top most priority. Both VR and VG has always tried to improve their visual experience. Moreover, both of these industries has been used for different type of simulations based on real life situations.

II. VIRTUAL REALITY

Virtual Reality (VR) tricks your brain into believing you are in a 3D world. It aims at immersing the user in an artificial environment where he will be able to feel and interact in real-time. Stereoscopic display is one of the way VR does this. This is done by displaying two slightly different angles of the scene to each eye, simulating depth. This along with other ways to simulate depth like parallax (farther objects to you seem to move slower), shading and techniques create an almost life like experience. VR, like digital game takes advantage of several other scientific areas like cognitive science, computer graphics, electronics etc.

II. A. HISTORY OF VR

VR has beginnings that preceded the time that the concept was coined and formalised. It has been in existence since the 19th century.

Stereoscopic photos & viewers (1838)
In 1838 Charles Wheatstone’s research demonstrated that how the brain processes different two-dimensional images from each eye into a single object of three dimensions. The two side by side stereoscopic images or photos viewed through a stereoscope gave the user a sense of immersion and depth.

The later development of the popular View-Master stereoscope (patented 1939), was used for “virtual
tourism”. Current day Google Cardboard and low budget VR head mounted displays for mobile phones uses this same design principles of the Stereoscope.

The first VR Head Mounted Display (1960)
The first example of a head-mounted display (HMD) was invented by Morton Heilig, which was called the Telesphere Mask (patented 1960), still it did not have motion tracking and was just a plain non-interactive film. The headset provided stereoscopic 3D and wide vision with stereo sound.

The term “Virtual reality” was coined (1987)
Still there wasn’t an all-encompassing term to describe the field even after all of this development. Jaron Lanier, founder of the visual programming lab (VPL), changed this and coined (or according to some popularised) the term “virtual reality” in the year 1987.

SEGA announce new VR glasses (1993)
This wrap-around prototype glasses had head tracking, stereo sound and LCD screens in the visor. Sega fully intended to release the product at a price point of about $200 at the time, or about $322 in 2015 money. Even then Sega could not be a success due to lots of technical development difficulties. This device could not clear the prototype phase despite having 4 games developed for itself.

OCULUS RIFT (2012)
The Oculus Rift, developed and manufactured by Oculus VR, a division of Facebook Inc., is a virtual reality headset. It was released on March 28, 2016.

In June 2015, Oculus revealed that it intended to release a newer version of Rift in the next 2–3 years after the Rift release, and that it was already in progress.
II.B. Virtual reality languages
Virtual reality can be programmed in several languages, some of the top programming languages are:

- **VRML (Virtual Reality Modelling Language)**: this is the earliest VR language for the internet.
- **X3D**: this has since replaced VRML
- **3DML**: this enables someone to visit a website via a plug in
- **COLLADA (Collaborative Design Activity)**: this allows file exchanges within 3D programmes.

II. C. APPLICATIONS OF VR

- Military
- Gaming
- Education
- Healthcare
- Film
- 3D internet

III. VIDEO GAMING

According to Google, a video game is a game that involves interaction with a user interface to generate visual feedback on a video device. The word *video* in *video game* traditionally referred to a raster display device, but as of the 2000s, it implies any type of display device that can produce two- or three-dimensional images.

The electronic systems used to play video games are known as platforms; examples of these are personal computers and video game consoles. These platforms range from large mainframe computers to small handheld computing devices. Games like arcade games, are designed for specialized hardware in which the video game components are housed in a large, typically coin-operated chassis, which were very popular in the 1980s, but gradually declined due to the widespread availability of affordable home video game consoles (e.g., PlayStation 4, Xbox One and Nintendo Wii U) and video games on desktop and laptop computers and smartphones.

III. A. TYPE OF VIDEO GAMES –

1. Arcade games
2. Computer Video games
3. Console games

III. B. HISTORY OF VIDEO GAMES –

This field was born in the mid twentieth century. Physicist Willy Higinbotham invents the first "video game" at the Brookhaven National Laboratory in Upton, New York. His game, "tennis for two", was played on an oscilloscope. [3]

**Tennis For Two (1958)**

American physicist William Higinbotham, created a precursor to *Pong* called *Tennis for Two*, which is referred to by many as the first interactive video game. The game uses an oscilloscope as a screen with a cathode ray tube. *Tennis for Two* players hold a controller with buttons and a rotating dial to control the angle of their racket's swing.
Magnavox Odyssey, the first home console (1972)
Magnavox releases Odyssey, the first video game console that plugs into a television, based on Ralph Baer's Brown Box design. *Ping Pong* was one of the 12 games featured in this console. Baer, who died in 2014, becomes known as the father of video games.

Space Invaders arrive (1978)
Space Invaders, released by Taito, becomes an international sensation, first in Japan, and later in the U.S. Released first in arcade format, *Space Invaders* leads to a shortage of 100-yen coins in Japan. Space Invaders releases for the Atari 2600 in 1980 and goes on to generate more than $500m in revenue throughout its lifetime.

The Nintendo 64 (1996)
Nintendo releases Nintendo 64 which has 64-bit graphics and 3-D games like new installations in the Mario and Zelda series. The 64 is the last cartridge-based system, but its fast load time and cartridge-based storage capabilities are still praised.

III. C. CURRENT WORLD OF VIDEO GAMES–
5 TOP RATED GAMING CONSOLES[5]
1. Sony Playstation 4
2. Microsoft Xbox One
3. Microsoft Xbox 360
4. Nintendo Wii U
5. Sony Playstation 3.

5 TOP RATED VIDEO GAMES of 2017[6]
1. Arms
2. Berserk and the Band of the Hawk
3. Call of Cthulhu
4. Dark Souls III: The Ringed City
5. Divinity: Original Sin 2

IV. VIRTUAL REALITY GAMING
Up till now, the topics discussed were the two parents of virtual reality gaming. In order to give the gamer a new enhanced experience in which you cannot just play a game, but can live inside of it, Gaming industry combined with Virtual reality world.

At its simplest, a VR game might involve a 3-D image that can be explored interactively on a computing device by manipulating keys, mouse or touchscreen. More sophisticated...
and immersive examples include VR headsets, wrap-around display screens and VR rooms augmented with wearable computers and sensory components, such as scents and haptics devices for tactile feedback.

IV. A. HISTORY OF VIRTUAL REALITY GAMES
In 1968, Ivan Sutherland created the first functioning computer-generated VR environment. Sutherland, a computer graphics pioneer, worked with student Bob Sproull to create a system that would track the user's head position and render a simple wireframe 3D environment based on their simulated field of view \(^4\). The device was dubbed the "Sword of Damocles" because it was too heavy to be supported by the human neck, instead hanging above the wearer from a mechanical arm. This setup wasn't a "game," per se, but it was the first working model of what would grow into commercial virtual reality.

IV. B. COMPONENTS OF VIRTUAL REALITY GAMES \(^8\)
1. Bio-sensing
The way of detecting a person’s presence in a game is bio-sensing. These are small sensors which are attached to a data glove, suit or even the body and record movements made by that person in a 3D space. Those movements are interpreted by a computer and trigger a variety of responses within that space.

Consider the example of Data Gloves, where you wear a data glove which has sensors attached to it. You wear this as part of a driving game. These sensors record the way your hand moves as part of this game, say, when turning the steering wheel in a particular direction.

These movements are fed back to a computer which then analyses the data and uses this to transform your actions into the appropriate responses on the screen.

This is known as an ‘immersive experience’. This is shown in the movie ‘The Lawnmower Man’ where the person interacts and explores virtual environment.
2. 3D internet
There are developers who like the idea of a three dimensional internet in which you are able to explore websites in a dynamic way. Rather than clicking on a link and scanning the information on a web page you will be able to physically touch that page and manipulate it. This type of interaction is seen in virtual worlds such as Second Life which allows you to socialise with others in a 3D environment.

IV. C. CURRENT WORLD OF VIRTUAL REALITY GAMES
5 TOP RATED V.R. GAMING HEADSETS
- Sony PlayStation VR
- HTC Vive/ SteamVR
- Oculus Rift
- Samsung Gear VR
- Google Daydream View

5 TOP RATED VIRTUAL REALITY GAMES of 2017
- The Lab
- Raw Data
- VR Funhouse
- Hover Junkers
- Fantastic Contraption

IV. D. FUTURE OF VIRTUAL REALITY GAMES
Google has been at the forefront when it comes to VR on mobile. Available now, the Google VR SDK and NDK allow for some very powerful VR development, and with Google Daydream being released later this year, mobile VR will see another leap in what is possible. Samsung has also had success with the Gear VR. Third party engines are also integrating Google VR into their engines. Unreal Engine now supports Google VR in 4.12 and Unity also is Google VR ready and Daydream ready.

REFERENCES