

# Augmented Reality Action Game Development using Unity

Dhaval Parmar<sup>1</sup> Smit Ramoliya<sup>2</sup> Prof. Vaibhavi Patel<sup>3</sup>

<sup>1,2</sup>Student <sup>3</sup>Assistant Professor

<sup>1,2,3</sup>Department of Information Technology

<sup>1,2,3</sup>Parul Institute of Technology, Vadodara, Gujarat, India

**Abstract**— This paper presents an action game which will be developed in Unity under an Augmented Reality technology. Augmented Reality is one of the research hotspots of many foreign universities and research institutions in recent years. AR technology has a wide range of applications such as, visualization of data model, medical research, virtual training, navigation of military aircraft, engineering design, entertainment and arts. AR makes it possible to create virtual game objects which are over laid on real world. The game engines are core of game development. Unity is one of the most popular game engines. Unity is a game engine that supports the development on multiple platforms including web, mobiles etc. Our aim is to provide a best experience to the users who wants to play more unique game play. We'll be taking advantage of the fighting and action genre with Augmented Reality. AR combines real and computer-based scenes and images to deliver a unified but enhanced view of the world.

**Keywords:** Unity 3D, Augmented Reality, Game Development

## I. INTRODUCTION

Humans cannot live without games nowadays. Day by day many games come with more advance feature. In addition, action games has its own special humanistic value. In earlier years, most of kids and teenagers used to go to "Game Zone" or "Cyber Cafe" to play games for which they have to pay some charge. After some year personal computer are made cheaper so people started playing games at home but till now it is not much good because of graphic, storyline, sound and people have seat at one place for long time to play game. In 2008, Google introduce Android operating system for mobile device, which will popular in near years. People were start using android mobile. After this gaming industry will goes higher and higher. Lots of android games are available on play store. All the people enjoy to play games in mobile device then personal computer. Dr. Driving, Hill Climb, Temple Run, Subway surfers, Angry Bird, Candy Crush, Mini Militia, Clash Of Clan (COC), Pokemon Go, Shadow fight, PUBG are some of most popular android games. In present gamers want something new in every game. So, we are going to implement AR in action game to provide the best experience to the user. We will develop game in Unity and uses Google AR Core for Augmented Reality support. This game can be play on every device which supports Google AR Core.

### A. Unity:

Unity is a game engine which provides so many functionality to develop a game. We can develop 2D & 3D game in unity engine. It allows to make AR application in it. We can develop games as well as application in unity engine. It is cross platform engine. It allows developer to create game for android, ios, tvOS, windows etc with the

same base code. There is a scene tab and game tab. In scene tab developer make changes in game where in game tab tasting is taking place. Unity engine uses C# language as scripting language. In earlier days javascript use as a scripting language. Unity has its own asset store in which there is number of free asset available to develop game.

### B. Google AR Core:

ARCore is Google's platform for building augmented reality experiences. Using different APIs, ARCore enables your phone to sense its environment, understand the world and interact with information. Some of the APIs are available across Android and iOS to enable shared AR experiences.

## II. PROPOSED SYSTEM

The proposed system aims at creating high quality 3D action game using AR. Fiducial markers are tracked using physical camera of mobile phone and 3D models of players are mapped to the marker. This 3D models are our players which will fight with each other. One of the player controls by user and another one will control by system. User can interact with 3D modes and observe every move which can play by players.

## III. GAME DESIGN CHALLENGES

Nowadays, gaming industries has grown day by day because game developing is easy with game engines. Game design creates goals, rules and challenges to define a board game, card game, dice game, casino game, role-playing, sports, videogame, war game or simulation that desirable interactions among its participants and possibly spectators. This can be positive thing for gaming industries but not every game is good game. Most of the developers create game for their entertainment only they don't have good knowledge of development and game theory. Game developer must understand the player's view, what player wants in game, game play, user interface.

### A. Game Play:

In game design, gameplay is necessary component required to make a game. Gameplay specify how the player interact with games. Gameplay defines game rules, connection between players and game, challenges, graphics, audio element. If your game play is quite good then your game can be performed good. Quality of gameplay is must consider to be make good game. Gaming industries all over the world are focuses on how to improve their gameplay to deliver good quality of game to the users.

### B. User Interface:

After gameplay the most important challenge of game development is user interface. Before start game development developer must be clear with user interface that how the final build looks like as per that developer start

working on development. User interface means how the communication took place between players and game. User interface can be divided into two part. The first is players gives some input as a action in game. Where the second one is how the game response of that input and shows output to the user. User interface can be first impression of your game.

#### C. Game Purpose:

“The purpose of any game is first to benefit all those who have opted-in. Even though the game may seem dysfunctional from the outside, the players all get something from playing in it. There is thus an underlying ulterior purpose.” (Anonymous). One of the challenges is about designing games is game purpose. Games are usually structured for entertainment and fun, sometime it can be education also. This challenge took place first in development process. Purpose of game should contain entertainment or fun, some challenge which can attach user, some rewards to encourage player. Educational games are improve state of mind of player. Games like puzzles are example of educational purpose game. “All these game design elements align well with established learning theories such as social constructivism and flow theory.” (Anderson, 2011). Designing games for particular purposes present an new challenge, as it requires a deep understanding of game design, knowledge of the specific topics.

#### IV. CONCLUSION

We will develop a game that will be use AR technology which provides a better experience to the gamer in gameplay. Augmented Reality is such a technology through which augmented objects can be overlaid into the real world. This hot and trendy technology. We can develop such a game in unity engine which we discuss in this study. Because unity provides all the necessary things which will use in game development like graphics, UI, audio etc.

#### REFERENCE

- [1] Kultima, Annakaisa. "Game design research." Proceedings of the 19th International Academic Mindtrek Conference. ACM, 2015.
- [2] Ahmad, Ibrahim, et al. "Game Interface Design: Measuring the player's gameplay experience." International Visual Informatics Conference. Springer, Cham, 2017.
- [3] Shaunak Shirish Deshmukh, Chinmay Mandar Joshi, Rafiuddin Salim Patel, Dr. Y. B. Gurav "Methodologies in Augmented Reality." (2019).
- [4] Dhvani Vora, Deepal Udasi, Tejas Bhatti, Arnav Desai, Namrata Lade et al. "Marker Based Augmented Reality Techniques."(2018)
- [5] Jadeja, Abhijitsinh, Richa Mehta, and Deepak Sharma. "New era of teaching learning: 3D Marker based augmented reality." International Journal of Information 6.1/2 (2016).
- [6] Kuittinen, Jussi & Holopainen, Jussi. 2009. Some Notes on the Nature of Game Design. Breaking New Ground: Innovation in Games, Play, Practice and Theory. Proceedings of DiGRA 2009.

- [7] T. Hiller, and S. Feiner, "Mobile augmented reality" wpi.edu, year 2004.
- [8] Pratik Mahale & Shreesha Yeddu. "Android Based Augmented Reality to Enhance Educational System", International Journal of Computer Applications (0975-8887), Vol.146, No.6, July 2016.