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Augmented Reality Gaming

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Abstract: This project is completely a Game which will be developed on Augmented Reality technology. The main objective is that to make an efficient Augmented Reality game that is playable on almost every Android devices that is possible. It works by capturing a scene which has more intensity by use of an camera in a device. This project also overcomes the problem of no UI buttons for some AR games which are mostly unofficial. In our project we add UI buttons for the shooting game actions into an AR Concept. It will be developed using UNITY game development engine (Game developing software) with VUFORIA extensions in it with the Vuforia license provided. We use Unity3d and Vuforia to make the players feel as they are surviving in the game.

Keywords: Augmented, unity, Vuforia, artificial intelligence, marker based.

I. INTRODUCTION

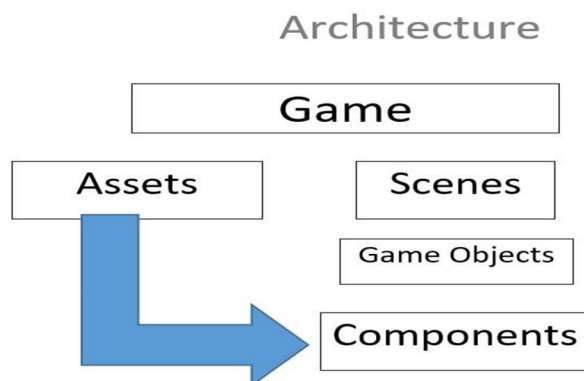
Augmented Reality(AR) generally refers to a synthesized perspective of the real physical environment using computer-generated imagery. Additionally it is also commonly accepted to be interactive in real-time and registered in 3dimension. Games are often recognized as the best application of AR technologies. Hence vast majority of work in both AR research and industry are focused in making games, and this paper aims to provide a review of the state of the art in this domain.

The objective of this project is to develop a game which is completely based on AUGMENTED REALITY (AR) technology. This game is generally based on USERDEFINEDTARGET (UDT) based Augmented Reality which gets any image target which can be targeted by user. The targeted image should be with little bit high intensity and it also depends on the camera quality of the device. The game is specifically designed for android devices. The main objective is to scan the image targets so that a game can be played in AR background.

II. LITERATURE SURVEY

Video game development is the process of creating a video game for any platform. The effort is undertaken by a game developer, which may range from a single person to an international team dispersed across the globe. Unity is a cross-platform game engine with a built-in IDE developed by Unity Technologies. It is used to develop video games for web plugins, desktop platforms, consoles and mobile devices. It uses c#, and unityscript (javascript), that is supported by the source code in C++ and its plugin support. Augmented Reality (AR) is a direct or indirect live view of a physical, real-world environment whose elements are "augmented" by computer-generated perceptual information, ideally across multiple sensory modalities, including visual, auditory, etc. Vuforia is an Augmented Reality Software Development Kit (SDK) for mobile devices that enables the creation of Augmented Reality applications. It uses Computer Vision technology to recognize and track planar images (Image Targets) and simple 3D objects, such as boxes, in real-time.

III. SYSTEM ARCHITECTURE



The unity game engine consists of all basic elements to create a game. They are,

A. Assets

An asset is representation of any item that can be used in your game or project. An asset may come from a file created outside of Unity, such as a 3D model, an audio file, an image, or any of the other types of file that Unity supports.

B. Scenes

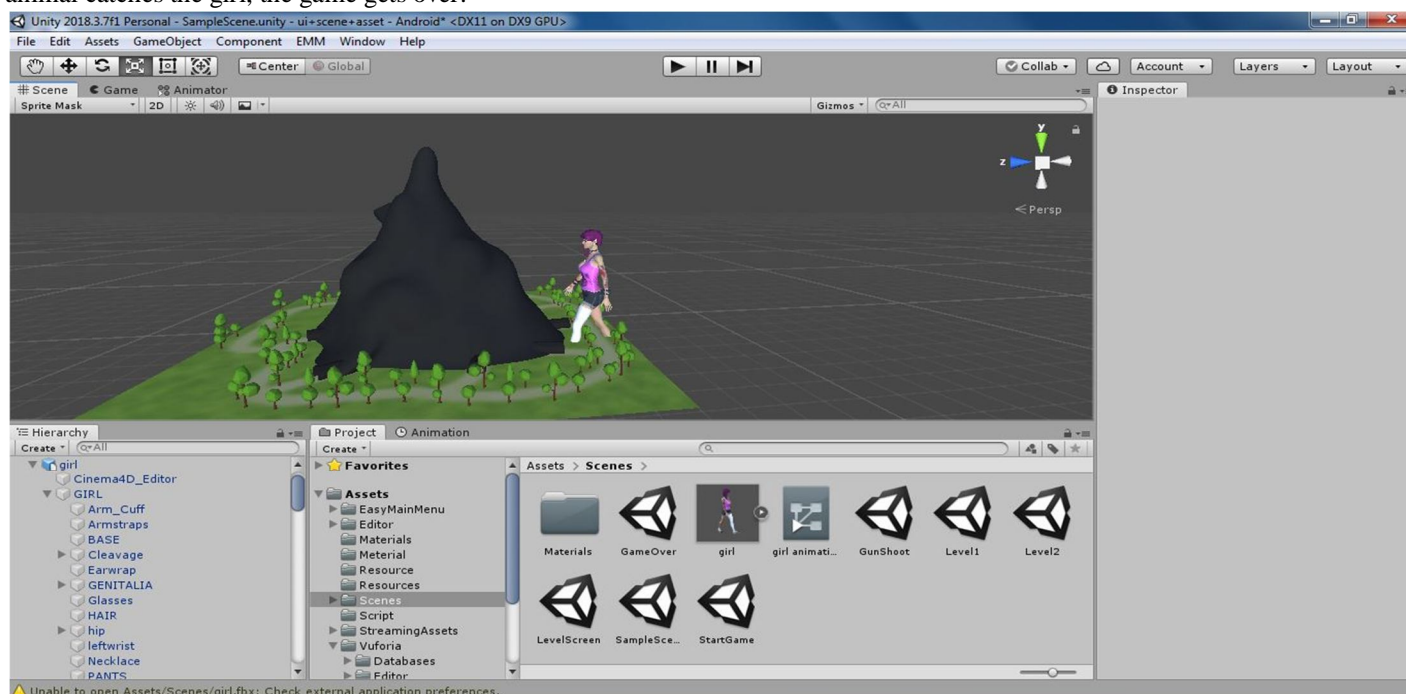
Scenes contain the objects of your game. They can be used to create a main menu, individual levels, and anything else. Think of each unique Scene file as a unique level. In each Scene, you will place your environments, obstacles, and decorations, essentially designing and building your game in pieces.

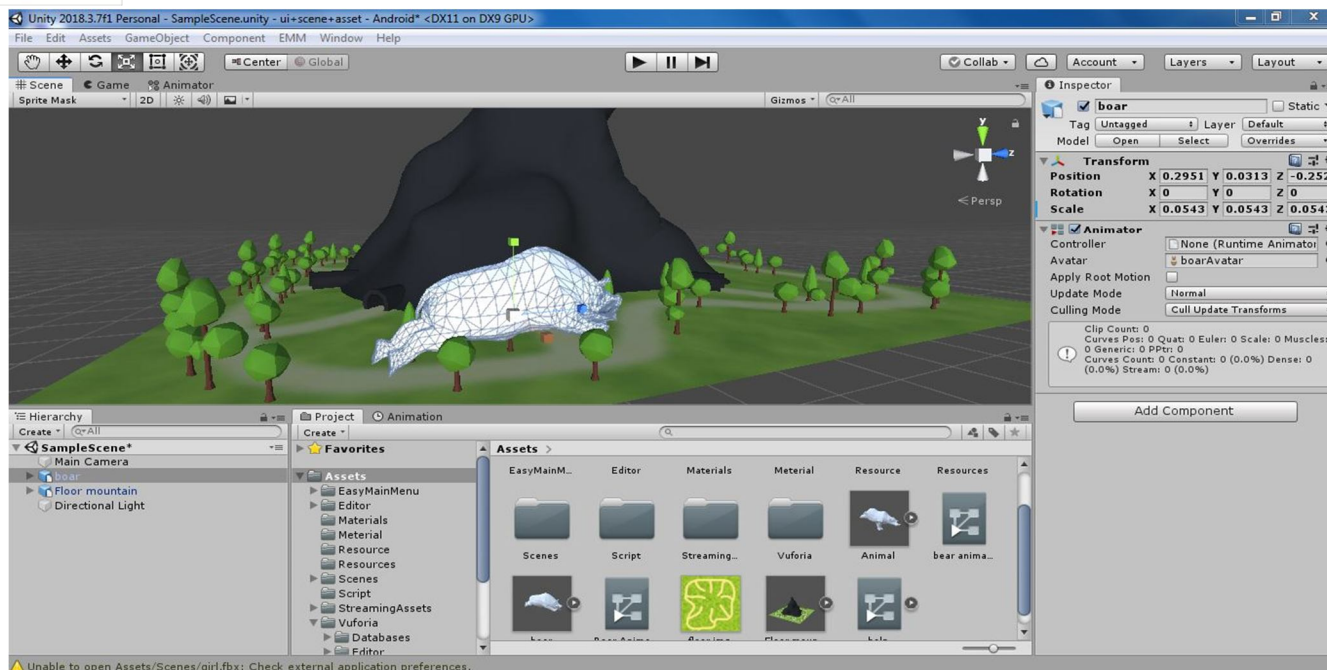
C. Game Objects

Game Objects are the fundamental objects in Unity that represent characters, props and scenery. They do not accomplish much in themselves but they act as containers for Components, which implement the real functionality. For example, a Light object is created by attaching a Light component to a Game Object. Vuforia TM is an Augmented Reality library distributed by Qualcomm® Inc. The library is free for use in non-commercial or commercial projects. The library supports frame marker and natural feature target tracking as well as multi-target, which are combinations of multiple targets. The library also features basic rendering functions (video background and OpenGL® 3D rendering), linear algebra (matrix/vector transformation), and interaction capabilities (virtual buttons). The library is actually available on both iOS and Android platforms, and the performance is improved on mobile devices equipped with Qualcomm® chipsets.

IV. WORKING

This gaming application is based on the concept of Augmented Reality. This game is developed using Unity Software. This game is marker-based which uses Vuforia to scan the target. Vuforia acts as a third party extension. Based on this technique, we have developed a shooting game. We have used C#, Visual Code and Blender Software for avatar creation. The mission is to save the girl from wild animals like Oar and Bear. The girl and the wild animals are introduced in the game using Artificial Intelligence. The player has to take down the wild animals by shooting them. The game can entirely be played only when the player is within the track or targeted area. Two levels are developed in the game for providing the player a different environment. When the player scores 50 points, first level gets over and returns back to level screen and the player can get into the second level play. Once the wild animal catches the girl, the game gets over.





V. CONCLUSION

Augmented reality shooting game which has been developed using unity and Vuforia. The problems faced in many other Augmented Reality on using marker based and marker less based Augmented reality apps are overcome simply by using the new user defined target concept which obtained by using Vuforia 7 extension used in unity. By using this UDT concept we can obtain the freedom of obtaining and using augmented reality anywhere and at anytime. So we can apply this AR concept any apps or games, that can be free for the usage. This problem is then resolved with support of Vuforia last updates the game is completely developed under unity engine's personal and free version. So the project which has been developed on Augmented Reality is completely free to develop with some predefined settings like image targets, AR camera, etc. In future the concept of AR can be integrated with cloud technology for enhanced technology benefits.

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