

VISUALEYES - Augmented Reality for Education

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Abstract— By expanding this present reality with virtual data, Augmented Reality gives additional opportunities for education. The education process should be all about imagination and interaction. A youngster learns the most when the exercise is intuitive. In this way, it's important to give them a stage where they can cooperate with the subject, for their psychological development. This application is a way to deal with satisfying that objective.

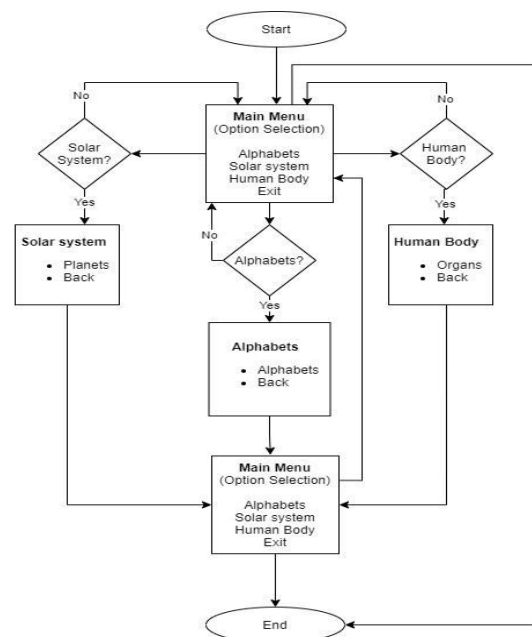
Keywords— Alphabet; Solar System; Human Body; Education; Augmented Reality; Unity; Blender;

Book is close to mixed reality that provides them with the visualization of 3d models for the respective alphabets and words. It also helps the children to learn about their body parts and about the universe. The colored visuals attract the children more than anything else since they see them first as the different phases of recognition. In this modern world, since everything is connected with smartphones, our application helps the education for primary students easier and understandable.

II.SYSTEM DESIGN AND DESCRIPTION

System Architecture

The whole system of this application is represented by this flowchart.



I. INTRODUCTION

It is very intense for primary children to catch them into their memory and the most well-known explanation behind one particular thing. It is very exhausting and they basically lose their interest after a couple of minutes. Teachers realize that the learning cycle must be about innovativeness and connection. Be that as it may, destitution and our current economy don't permit us to put further into this area. It is said that in this day and age a kid is brought into the world with a cell phone close by. This means our young age is more into cell phones and they will in general take it for their essential wellspring of learning and diversion. An investigation says that 80% of youngsters own cell phones and the majority of them are smart cell phone clients. While starting to expose Augmented Reality (AR) we had scratched the surface and planned to address the current issue. It may not be just as energizing as virtual reality, yet we can furnish them with something new. Our AR book will give them the energy that they need while learning. Every student these days must learn English since it's a universal language. The small children may not be familiar with 21 consonants and 5 vowels in English alphabets. For children above 4 years, they need to learn about their surroundings too in a universal language. So they need to be familiar with the 26 alphabets and some common words in English. Our AR

System Description

Our system provides users with three options Alphabets, Solar System and Human Body. Choosing one of the first 3 options will direct the user towards a new window which is actually the main scene of this application. Here the app takes access of the smartphone camera to detect any target image and shows a 3D model in the real-time (background). Of-course there is an option to go back to the previous window or Exit from there.

III.TOOLS AND TECHNOLOGIES

A. AR- Vuforia Software Development Kit (SDK)

Vuforia is an Augmented Reality Development kit for mobile devices. We can develop any kind of Augmented Reality application by using Vuforia SDK. Vuforia offers a free license key for learning purposes. Moreover, Vuforia SDK is easy to use and robust.

B. Unity Game Engine (cross-platform)

Unity Game Engine is a real-time game engine that is developed by Unity Technologies. Unity supports 27 platforms. It can be used to develop 2-Dimensional and 3-Dimensional applications. Compared to the other engines available in the market, the cost is very less. Unity also provides an asset store with a variety of asset components, although most of the highly developed ones would cost quite well. Overall it is good for developing Augmented Reality related applications as it supports Vuforia SDK.

C. Scripting Language –

C# C# is a language that supports both object-oriented and aspect-oriented programming. C Sharp is used as a scripting language in Unity. It is very robust and has rich class libraries. It is easy to use for developing applications in the Unity environment. Moreover, it is very fast and has no memory limitation.

D. Blender

Blender-3D Component Graphics Software Toolset is a 3D creation suite that is both free and open-sourced. It is a public project, made by people from all around the world. It supports the entirety of the 3D pipeline modeling, rigging, animation, simulation, rendering, compositing and motion tracking, even video editing and game creation. Blender supports a lot of file formats such as OBJ, FBX, 3DS, PLY, STL, etc. Blender also provides an internal format converter which helps in changing any 3D model format & adjusting the format in need without having to install any converters. Among the listed formats the “blend” format is the best and well supported in Unity thus making it a good choice.

IV.CREATING 3D MODELS IN BLENDER

All our 3D figures are formatted as “blend”, made & rendered in Blender which includes:

A. Alphabet

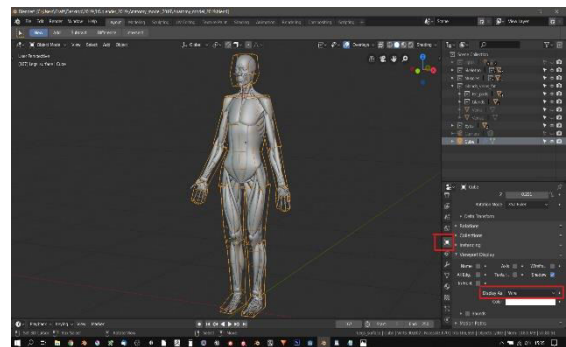
This section includes 3D figures of the objects which represent the English alphabets. The total English alphabets count up to 26 (only Upper case). Each figure is unique and identifiable with its corresponding target image.

B. Solar System

This section includes the 3D figures of the objects which represent each planet in the solar system. There are totally 9 planets in space. Each figure is unique and identifiable with its corresponding target image.

C. Human Body

This section includes the 3D figures of the objects which represent each part of the Human Body. There are various parts present in our human body, but we are trying to showcase some basic parts which are easy to show for the children. Each figure is unique and identifiable with its corresponding target image.



V.DEVELOPING APPLICATION IN UNITY

Incorporating Vuforia SDK in Unity and Development

We need to center 2 things here:

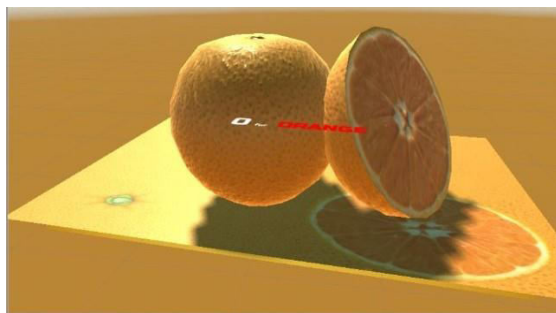
- The objective pictures.
- The comparing 3D Objects.

Right off the bat, the objective picture is a typical picture design that has been enrolled in the Vuforia data set that our application follows. This implies this image is considered as an objective at whatever point it is before the camera while our application is running its course. The objective picture is appraised from 0 to 5 according to the picture quality and some specific measures. The better the rating the better the objective picture is for the application.



Target image

Furthermore, the comparing 3D items are models delivered in Blender. These 3D models were imported as ".blend" document to solidarity for additional utilization.

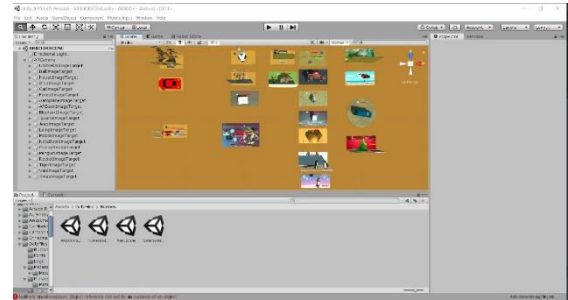


VLAPPLICATION OVERVIEW

We have named our application as "VISUALEYES". We have kept our UI easy and simple for the children. In the first window, it will display the three options (Alphabets, Solar System, Human Body) to select and an exit symbol to quit the app. It will be the main menu of our app.



Tapping on Alphabets or Solar System or Human Body will lead to the main scene where the app will take access to the smartphone camera to detect a target image that is already stored in the Vuforia Database. Upon detection, a 3D object corresponding to it will pop up over the target image. This 3D object is only viewable through the phone screen. Users can also quit the application directly from the main menu by tapping the exit icon on the main menu page.



VII.CONTRIBUTION

It is said that a powerful method to learn is the point at which it's good times. We made another energizing methodology for youngsters to find out about letters in order, the nearby planetary group, the human body. As youthful personalities are exceptionally flighty, they face numerous troubles retaining letter sets. Along these lines, we created a stage where the two of them can collaborate and learn. More often than not they find out about the close planetary system that they can never see or imagine. They may gain from the content scripted in their reading material, yet scarcely know about them or anything to contrast them and. They neglect to appreciate the information and regularly go straight for retaining, which shouldn't be the situation. This is the place where our application kicks in giving them a 3D perspective on that object visible from any point. A way to express the names and letters in order is given to help them handle the spelling and what the item is called. Educators and guardians struggle to show their kids. Yet, we give an easy-to-use interface both for the guardians and educators to utilize or instruct and the kids to gain from it. It was reasoned that, while onetime securing cost was high, the expense per class could be brought down by 93.34%, decreasing generally speaking expenses [11]. With respect to our application, it

is absolutely liberated from cost and effectively open for the client.

VIII.CONCLUSION

The aim to develop this application is to encourage our kids to learn and grow an enjoyable learning process. Parents at home or teachers at school can use this system to introduce alphabets and provide them with the minimum basic knowledge that they need for their mental growth. We can conclude that Augmented Reality is a revolutionary technology that we can use to achieve greater heights. No doubt, it has the capability to take the educational process to a whole new level [12]. Our application is only a fragment of what AR has to offer to the new generation.

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