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SMART BOOKS USING AUGMENTED REALITY

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ABSTRACT

A concept of using the technology of augmented reality to make the concepts in the books related to studies in various disciplines interactive and visually attractive to learners. The users will be able to visually interpret the conceptual diagrams, 3d models, videos, etc... related to the concepts in the book content via an android application supported by the android smart phones. This is developed using a game engine called unity 3d, with vuforia sdk for unity. The models may be imported from assets store online or created using 3d software like maya. This app serves as a AR screen or a display to give the 3d models related to the content in the pages. Such kind of learning using this app makes it easier for the user to understand the basic concepts and allows the user to learn in more interactive way, which is much better than the monotonous learning.

Keywords: android, augmented reality, interactive, unity, vuforia.

I . INTRODUCTION

Augmented reality is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. It is a live direct or indirect view of a physical, real-world environment whose elements are *augmented* (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. In this concept, we use android app as a medium to view the AR models related to a page in the books[1].

Augmented reality is changing the way we view the world -- or at least the way its users see the world. Picture yourself walking or driving down the street.

Now, researchers and engineers are pulling graphics out of your television screen or computer display and integrating them into Real -world environments. This new technology, called augmented reality, blurs the line between what's real and what's computer-generated by enhancing what we see, hear, feel and smell.

On the spectrum between virtual reality, which creates immersive, computer-generated environments, and the real world, augmented reality is closer to the real world. Augmented reality adds graphics, sounds, hepatic feedback and smell to the natural world as it exists. Both video games and cell phones are driving the development of augmented reality [2].

So augmented reality can be considered as a pseudo world or a fake layer which superimpose virtual 3d components which can range from simple 3d models to a fully 3d video on a particular tracker. The android app used for viewing it contains the info about the contents and it displays the contents once it tracks the corresponding pattern or page. It is built using Unity 3d with Vuforia SDK package. Such a app would really contribute a lot to education field in making the concepts more clearer and this is a step towards hologram or real 3d implementation of objects in the future.

Using 3d models can make the students feel closer or more related to what they are studying and so they get to understand the content clearer.

It also helps people who can't afford education, as tutorial like videos can also be added as VR in addition to the models for self-paced learning of the students. Moreover, it is also a way to save the paper bound books being replaced by digital e-books [2].

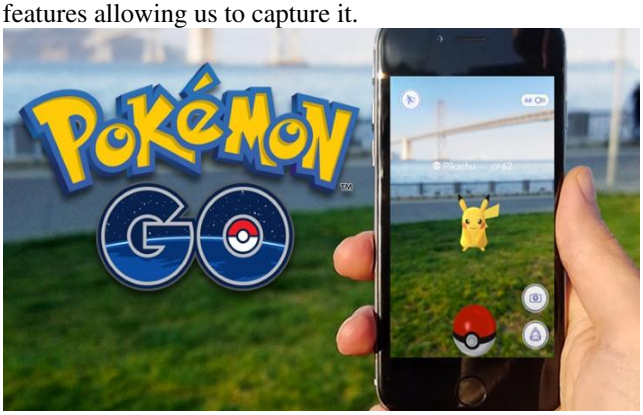
Other than education AR technology can also be implemented in comics and magazines displaying the models or videos of their favorite stars in action featuring in 3d.

So this kind of books may be the next big thing we can get to see in book publishing and manufacturing.

II. EXISTING SYSTEM

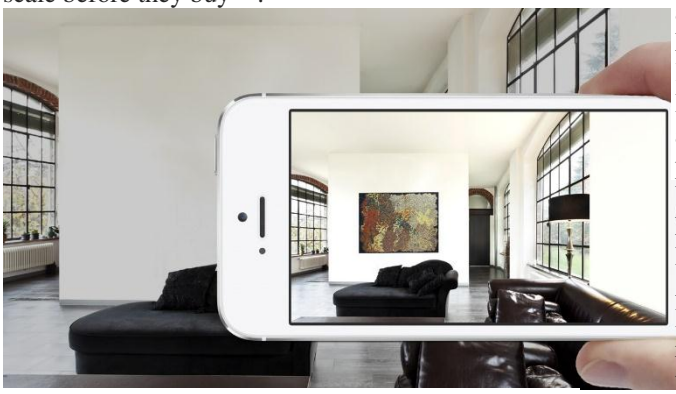
Augmented reality is mainly gathered its popularity through games, particularly pokemon GO,

released by nitendo where pokemon's spawn at random locations based on the place atmosphere. The 3d model of the characters of the games pops up in your camera screen with minimal animations and features allowing us to capture it.



And there also a set of other such games which uses the concept of augmented reality.

the Luxembourg startup itondo.com launched an AR app for the art market that lets art buyers accurately visualize 2D artworks to scale on their own walls to scale before they buy [1].



Loreal Paris brought the AR experience to a personal level with their "Makeup Genius" app. It allowed users to try out make-up and beauty styles utilizing a mobile device.

Apps like Sky View using augmented reality technology is being used to learn astronomy.

There are apps used for engineering like AR circuits for building virtual circuits and Construct3D, a Studiers tube system, allowed students to learn mechanical engineering concepts, math or geometry [4].

There are apps which gives the anatomy of humans for medicinal studies.

And there are many such apps which being developed and used for various purposes.

III. PROPOSED SYSTEM

The proposed system is built using unity 5.4.2f2 game engine with vuforia sdk for unity. Unity is a cross-platform game engine used to develop video games for pc, mobiles etc. It uses OpenGL ES Api for graphics in android. This software provides as a good tool for developers to develop new games and as well as software using AR/VR technologies.

Vuforia is a augmented reality sdk for mobile devices used to develop apps with AR features. Computer Vision technology is used to recognize and track planar images and simple 3D objects, such as boxes, in real-time. It enables developers to position and orient virtual objects, such as 3D models and other media, in relation to real world images when these are viewed through the camera of a mobile device. The virtual object then tracks the position and orientation of the image in real-time so that the viewer's perspective on the object corresponds with their perspective on the Image Target, so that it appears that the virtual object is a part of the real world scene.

The Vuforia SDK supports a variety of 2D and 3D target types including 'marker less' Image Targets, 3D Multi-Target configurations, and a form of addressable Fiduciary Marker known as a Frame Marker. Additional features of the SDK include localized Occlusion Detection using 'Virtual Buttons', runtime image target selection, and the ability to create and reconfigure target sets programmatically at runtime [3].

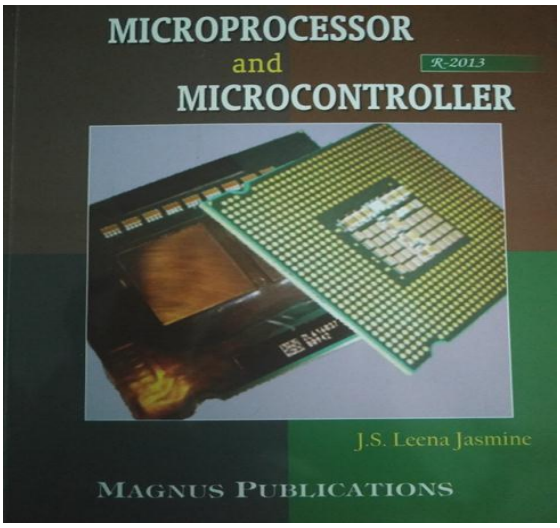
Vuforia Offers The Unity Extension And Core Features Sample.

Here we use the pages of the book as marker.

A sample app for two different image targets.

First image target and it's feature image (i.e.),. It represents the points which is used by the app to track the marker.

. IMAGE TARGET -1



FEATURED IMAGE OF TARGET

1

FEATURED IMAGE OF TARGET 2

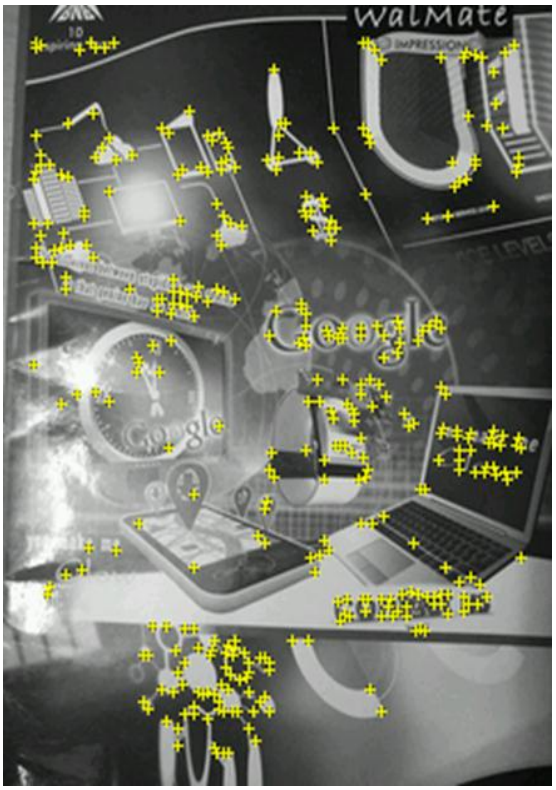


IMAGE TARGET -2

MODEL OF A FORKLIFT OF TARGET 2

THE AR MODEL IMPOSED ON ROBOT ON TARGET 1

ADVANTAGES

1. This system is an easier way to make the learners understand the model.
2. It would be the most interactive form of gaining knowledge till now.
3. It just requires an android phone and the corresponding book with no need of any special equipment.
4. It can also be used to implement for advertisements in magazines.
5. Moreover an interactive 3d model is way better than monotonous text with limited pictorial representations of the concept.

CONCLUSION

Thus, hereby We Conclude that the "Smart Books Using AR" will be implemented in the future generation and will be useful to all students which helps to develop their practical mind. We will assure that the AR will play a Vital role in Forthcoming generation.

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