3D Modeling of Website in Augmented Reality

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Abstract:

The Web, as we know it has long history for design and creativity, and new level aim to wide range of emerging technologies to web AR, VR, IOT etc. We adding AR and Unity 3D capabilities to the web and using it try to level up standard of existing web sites. 3D modeling of Web in Augmented Reality the name itself is self-explanatory, It is a branch of augmented reality that makes us feel and experience the enhanced reality with the help of daily use devices like mobiles, tablets, etc. What we feel if we experience 3D Web in augmented reality by just surfing on device? Well, this is possible with the help of this technology. After Wearing Holo-lens, web content viewable to user in real life.

Keywords: Augmented reality, 3D modeling of web, Web AR, Holo-lens, world wide web, Unity 3D, Vuforia.

1. Introduction

In this rapidly changing world,we need to upgrade web technology too. As we see, user and website visitor want to know something new and interesting, as per user need we have to add new and emerging technology to web. As result of newly emerging demands, 3D modeling of Web in Augmented reality using unity 3D, Vuforia, Blender can satisfy all dynamic demand of user.With the use of augmented reality and Holo-lens shows,we web content in real life. As we propose this paper is nothing but just a further advancement in marketing and it change whole era of using website.

2. Features of System

To change the edge of websites by converting them into 3D using unity 3D, Augmented reality, Blender. It gives real time experience to user. You have to wear Holo-lens and web content appear in real life or we can say in front of your eyes.

3. Objectives

i. To design assets in 3rd for website content with the help of blender software.

ii. To apply that assets and markers in website with help of vuforia. (This could add a new interactive dimension to this conventional.)

iii. To develop such website in unity 3D which gives immersive personalized and interactive experiences to real world.

4. Literature Review

"Augmented Reality Adaptive Web Content" (Feb 2016), 2016 13th IEEE Annual Consumer Communications & Networking Conference (CCNC) Augmented Reality (AR) browser that renders web pages. The AR Website opens up a new possibility space for content developers, while simultaneously assuring privacy and security to the end user [1]. "Thoughts on the Future of WebXR and the Immersive Web"2018, 2018 IEEE International Symposium on Mixed and Augmented Reality. Idea to bring a wide range of emerging technologies (AR, VR, voice, IOT, etc.) to the web. Web-based Augmented Reality (Web AR) provides a lightweight, cross-platform, and pervasive AR solution for websites [2].

5. Methodology

We propose this paper with objective of, to give new view to traditional website by converting web into 3D Web in Augmented Reality. By creating 3D asset and marker for website. General Flowchart/Architecture of proposed system for 3D modeling of website is shown in Figure1.
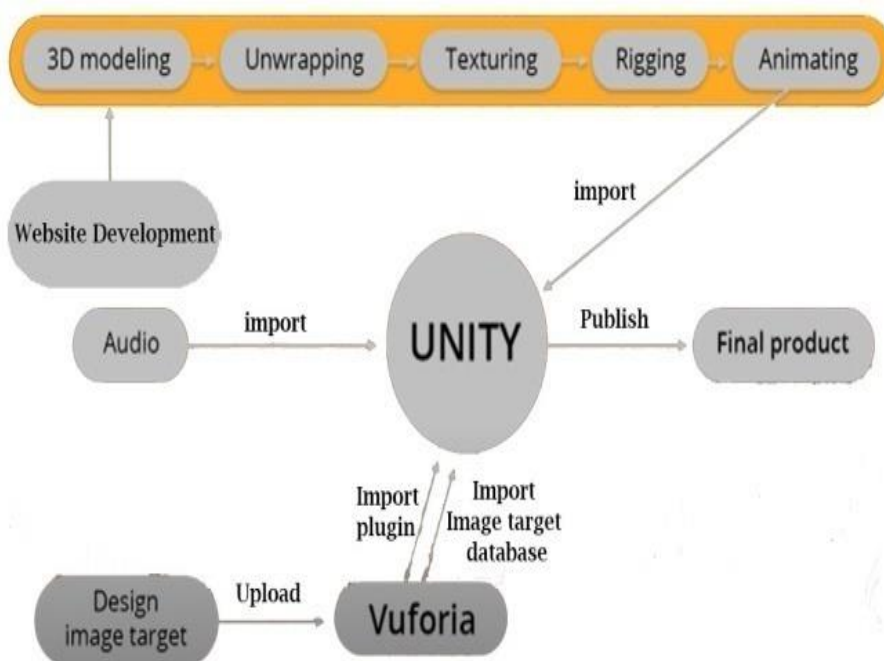
Fig. 1. Work Flow of Proposed System

In this system, content of websites Appear in front of your eyes and you experience it in real world. It is possible due to Augmented Reality, Unity and Vuforia Engine. At the core, AR is image-tracking technology, therefore we added image to track 3d model. Now Vuforia engine will actually convert image into Gray scale image inside their target image database .In other words, the AR engine is actually colour-blind. So do not create image that may look contrast in colour but looks low-contrast when converted to gray scale. After that go to Vuforia website which is Vuforia.com. We have to download three things from the Vuforia website i.e. Vuforia plug-in for unity, the license key for application, download database which contain the image targets.
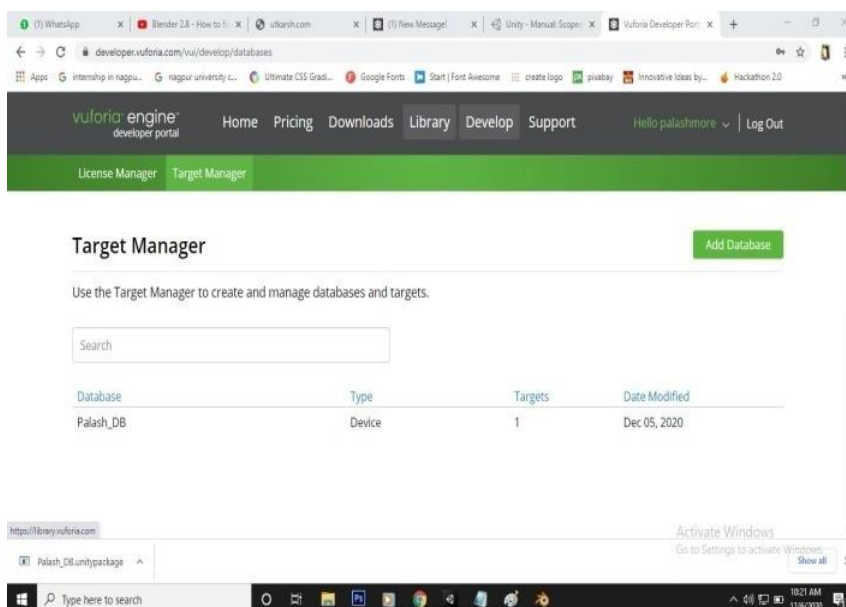

Fig.2. Image Target Database in Vuforia Engine

As our project contains multiple image target, we can have a single database for all image target. Now in unity we have to open unity plug-in. Then import the Vuforia plug-in. To do this simply go to assets menu > import package > custom package. Choose the file of the Vuforia plug-in, hit open, and Press import. [*]
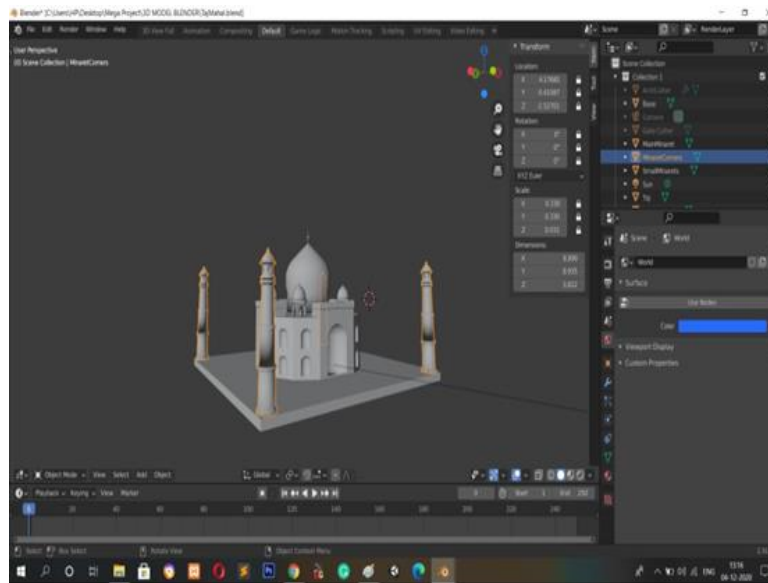

Fig. 3. 3D model of Taj Mahal in Blender

Now the Vuforia library is alive inside our project. Vuforia has their own dynamic camera that tracks and move dynamically in 3D space according to the movement of user's device when tracking the image target. There no need the default unity camera, so delete it. Add Vuforia camera prefab into the scene. Browse to Vuforia > prefabs and choose "AR Camera", click and drag this to the hierarchy panel to the scene. Next, we need to import the database into our project. Just do the same method as before. [*] After the database goes in to the project. Go back to camera and turn on "databasename_DB data" and then check on activate button. Now add the image target into the scene place in its proper position.
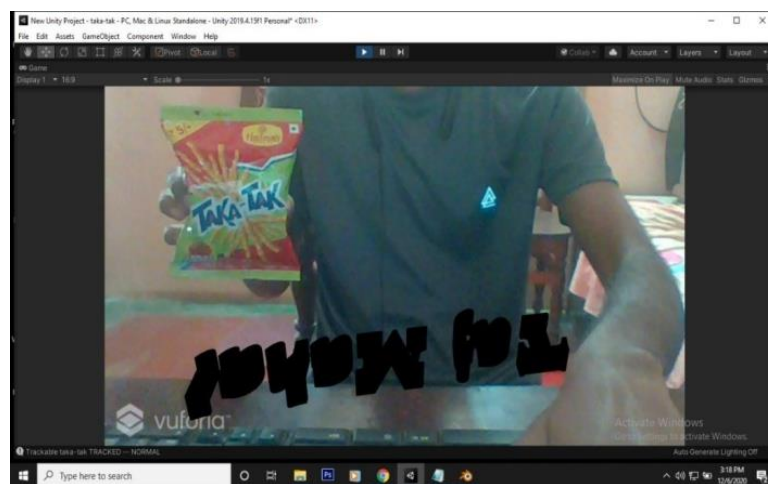

Fig. 4. Tracking of 3D model with image target in Unity Software

Importing 3D content from Blender to unity. For importing, you have copy the ".blend" file and the texture file that is a "png" image format. There are two things you usually need to do after importing 3d models to unity is, setup the material and texture and setup the animation. First, we need to setup the material by default, Unity will convert material from Blender to standard material.

Now as per website requirement we do it procedure for multiple image target in website by arranging all 3D model in our application, our website is ready to view in AR with help of Holo-lens.

6. System Requirements

Hardware & software is the most essential part of any technology system. 3D Modelling of Website in Augmented Reality used following hardware & software system.

6.1. Hardware Requirements

Holo-lens: It is based on augmented reality, which they call "mixed reality". Holo-lens use multiple sensors, advanced optics, and holographic processing which combine with environment. These holograms are used to display information, blend with the real world, or simulate to virtual world.

6.2 Software Requirements

i. Blender: It is available for download on Windows Vista, 7, 8, 10 32-bit/64-bit; Mac OS X 10.6+ 64-bit, GNU Linux 32-bit/64-bit FreeBSD 64-bit. Graphics drivers must be up to date and OpenGL is should support. Blender needs minimum requirements; so check requirements before install Blender.

ii. Unity: Unity is a cross-platform game engine for creating games in both 2D and 3D. Unity supports building games for many platforms such as Windows 7 SP1+, 8, 10, 64-bit versions only; Mac OS X 10.12+; Ubuntu 16.04, 18.04, and CentOS 7, Oculus Rift, and many more.

iii. Vuforia Engine: It is a software development kit (SDK) for creating Augmented Reality apps. Developers can easily add advanced computer vision functionality to any application, it recognize images and objects.

7. Applications

i. With less potential for error than with wearable technology, AR is already starting to improve user experience on desktop and mobile.

ii. E-commerce web designers have been implementing AR in recent years, making use of webcams or Smartphone cameras to help consumers choose their products.

iii. In fashion retail, for example, AR is used as a "virtual dressing room" experience.

iv. Users can point their desktop or Smartphone camera towards themselves and scroll through outfit choices that are displayed on the screen.

v. AR is not just improving the user experience in the retail – besides webcams or Smartphone; it is also being used with headsets in the engineering, education and aviation industries.

vi. Visual representation is just one facet of AR – users can also interact with sound, touch.

8. Results

i. As result of technology, It boost user experience of websites and more convenient to use. It can change the definition of surfing on website.

ii. Visitors get more detailing about product and increase chances to buy product or use the service given by Website.

iii. Due to 3D modelling of websites there is drastic change in digital marketing trends.

iv. It also improves the online educational facilities and make more efficient to learner.

9. Conclusion

Augmented reality combining with web development will be excellent way of providing amazing user experience. Using these techniques one can make his/her website more interactive. Tech giants like Amazon, Flipkart and many other companies can use this approach to catch more user and increase their revenue. Our approach of adding AR to Website is simple yet effective so that anyone can work on it.

10. References

[1]. K. ChalapathiRaju ; K. Yugandhar ; D.V.N. Bharathi ;NagavalliVegesna(June 2019) ,"3D Based Modern Education System Using Augmented Reality" Augmented Reality.

[2]. XiuquanQiao, Pei Ren, Huadong Ma, SchahramDustdar, Ling Liu, Junliang Chen (April 2019) "Web AR: A Promising Future for Mobile Augmented Reality - State of the Art, Challenges, and Insights.

[3]. Google, "Article", https://google-ar.github.io/WebARArticle/public/

[4]. Microsoft Hololens. [Online]. Available: microsoft.com/microsofthololens/en-us

[5]. Junaio – Augmented Reality Browser. [Online]. Available: junaio.com

[6]. The Argon AR Web Browser. [Online]. Available: ael.gatech.edu/argon/

[7]. MacIntyre, Blair. WebXR: Reflecting on the Needs of Real AR on the Web. https://medium.com/@blairmacintyre/webxr-reflecting-onthe-needs-of-real-ar-on-the-web-57ce13b14a7d.

[8]. Kavya Shakthi R.P; Kavin Raja A.S; Janani S.R; Sangeetha K. "Industrial Machine Identification Using Augmented Reality". *International Research Journal on Advanced Science Hub*, 3, Special Issue ICARD-2021 3S, 2021, 68-71. doi: 10.47392/irjash.2021.066