

Augmented Reality in Interior Design

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Abstract - This paper presents associate application of increased Reality (AR) for interior style. Due to gigantic advancements in laptop vision algorithms and low cost hardware, increased reality is turning into thought. Most of the sales come from physical stores. Buying furniture from brick and mortar shops is unwieldy and time consuming. In associate AR atmosphere, the virtual furniture can be displayed and modified in real-time on the screen, allowing the user to have an interactive experience with the virtual furniture in a real-world environment. Users would be able to visualize specifically however a table would seem like in their room. When people can place an actual couch on the living room or visualize how a bookshelf would look in different colour. The risk of product come back and supplying is drastically reduced. As on-line stores replace brick and mortar outlets, AR will play a vital role in the furniture sales. This paper provides new ways an individual/enterprise could utilize AR to design interiors and this study proposes a new method for applying AR technology to interior design work, where a user will read virtual article of furniture and communicate with 3D virtual furniture information employing a dynamic and versatile programme.

Key Words: Augmented Reality, Interior Design, Markerless AR, Markerbased AR, 3D View.

1. INTRODUCTION

The word “augmented” means “to increase”, hence augmented reality means to increase reality. Augmented reality abbreviated as AR is a new technology that blurs the line between what’s real and what computer is generated by enhancing what we see, smell, hear and feel.

This paper presents an increased reality system for coming up with interior style comes victimization overlaid virtual piece of furniture in an exceedingly physical setting supported an everyday computer home system.

1.1 Projection Based AR

As its name suggests, it is based upon projection onto object surface. For instance you can project a virtual keyword onto a wall and use computer vision to track your finger movements when pressing something

1.2 Recognition Based AR

Recognition based augmented reality relies on recognizing real world items such as barcodes, images, texts, etc. to

provide information. The most common type of Recognition Based AR application is a language translation app which uses camera to read the text, translates it and overlays on top of an image.

1.3 Location Based AR

Location based mostly increased reality depends on location of the device, orientation, sensor data to find out where the user is looking and provides meaningful information based on that.

Famous example of location based mostly increased reality is Pokémon Go.

1.4 Superimposition Based AR

Superimposition based mostly AR permits users to merge real and virtual worlds. It permits the user to urge an alternate of the thing by commutation either a little or a whole read with an increased read.

2. Types of Augmented Reality Techniques

- **Marker-based AR**

Marker-based AR application usually involve image recognition, the images that are to be recognized are predefined in the application. During runtime the app analyses the camera stream and try to find marker (target). Once it detects the marker, the AR markers are used as the location for rendering virtual objects. AR markers can include wide range of images but usually these are small, two-dimensional barcodes known as data-matrix codes or it’s a 2D image printed on something like a poster. The target is recognized via the camera by the augmented reality application device, the image is processed, the barcode is turned into a web address, and an appropriate web page is called up by the browser with further information. The benefit of using this tracking method is that it’s more convenient to use as the markers or targets can be recognized easily by the camera. Also, a more stable, accurate, tied to a particular point, image is obtained using the markers. Due to its simplicity of implementation, it is the more popular option currently.

- **Marker-less AR**

Marker-less AR applications recognizes objects that were not predefined. Application recognizes different

features, patterns, colours etc. As there is no predefined image targets on the app. During runtime the app has to analyse the different variables in camera frame to trigger AR actions. This tracking method works by using scanning algorithms and feature detection systems. Say, we want to find the information about some object, we can simply point our phone at it and have some kind of feature-detection or pattern identification systems try to recognize it. Specific scanning algorithms are used to identify it. It creates or projects a virtual grid on the image caught by our camera. And to pinpoint the exact location, the automatic scan finds several anchor points and binds a virtual model to it. The marker less technology has many advantages including that the real life object can serve as a marker by itself and there is no overhead of making or creating markers on the objects. We don't have to make distinctive optical identifiers. The physical objects have the digital images projected directly upon them. This is known as projection mapping and can be used to quite remarkable effects.

3. WHAT ARE WE TRYING TO BUILD

We are building a mobile app that allows user to visualize and interact with furniture using their smartphones in augmented reality environment. AR permits an application to use the phone's camera and sensors to directly place a virtual object within the area seen by the camera.

Our application utilizes marker-less AR technology to place objects in a 3d space without the need of a marker. We are using this technology to develop an interior design application for previewing furniture virtually in your own home.

4. GOAL OF READING PAPERS

The main goals of this analysis is to make an app that's ready to know the methods required to render totally different furnishings models and be ready to act with them mistreatment different gestures.

We determined that the system will perform the following tasks:

1. Select a furniture from a menu
2. Place a furniture by tapping on the screen
3. Remove rendered furniture
4. Change material of rendered furniture
5. Move the location of furniture
6. Take a picture of the current environment and store in the local storage
7. Load 3d models from local storage

5. FUTURE WORK

We are trying to integrate photogrammetry to our existing platform which will allow us to reconstruct a 3d model of furniture from pictures. As of now the user can only visualize the 3d models that are in the local storage, we would like to expand this functionality. We intend to connect the app to a cloud repository from which a user could browse furniture and import it during runtime. In addition, we are planning to revolutionize the way we share things by using photogrammetry principles.

6. CONCLUSIONS

With advancements in computer vision technology and cheaper hardware, AR can only flourish. AR has its unique advantages and is very good at tackling especially visualization problems. In an AR environment, buying furniture could be convenient and easy while saving costs by completely lowering the risk of product returns. In this research paper, we examined how a marker-less AR could be used for online furniture sales. We proposed a mobile application that enables users to visualize furniture in virtual reality. We reviewed the area of augmented reality and the different technologies used to implement it. The review contributes the information about the AR components such as the display, tracking and orientation, software systems and different algorithms used; the study of different types of AR applications. Augmented reality is likely to worm its way into our daily lives more and more in the 21st century. Thanks to technologies like increased reality, the way we work with computing devices and think about the partition between digital and analogue realism is expected to transform vitally.

The review concludes that there is a lot more to research upon and implement in this technology and it has a long way to go. This analysis examined virtual article of furniture and adjustment work to make a brand new style technique mistreatment increased Reality technology for Interior style education.

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