

# INTERIOUR DESIGN USING AUGMENTED REALITY

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*Abstract-In an AR environment, 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 Finally, this study proposes a new method for applying AR technology to interior design work, where a user can view virtual furniture and communicate with 3D virtual furniture data using a dynamic and flexible user interface. Plus, all the properties of the virtual furniture can be adjusted using occlusion-based interaction method for a Tangible Augmented Reality*

## 1 INTRODUCTION

AR or mixed reality is a new technology that requires the overlay of computer graphics on real world. Augmented Reality is also known as Mixed Reality(MR), which mean a multi-axis spectrum of areas that cover Virtual Reality(VR).

Virtual Reality means computer-generated 3D environments that permit the user to enter and interact with man-made surrounding. The user are able to absorb them to changing degree in the computers artificial world which may either be a simulation of some form of reality or simulation of complex phenomenon VR and telepresence. Virtual Reality actually means an immersive multi-media, is a computer-simulated surrounding that can simulate physical presence in places in the real world or artificial worlds. It is mainly used for applications related to immersive, highly visual, 3D environments.

Telepresence means a set of technologies which allow a user to feel as if they were present, or to have an effect, via telerobotic at a place other than their true location.

## 2 AR Devices

AR can be categorized into four types:(1)Optical See-Through, (2)Virtual Retinal Systems,(3) Video See-Through,(4) Monitor Based AR,(5) Projector Based AR.

The following sections show the correspondng devices figure.

### 2.1 Optical See-Through HMD

Optical See-Through AR uses a transparent Head Mounted Display to show the virtual environment directly over the real world Figure(1).



## 2.2 Virtual Retinal Systems

VRS produce a full color, wide field-of-view, high resolution, high brightness, low cost virtual display.



## 2.3 Video See-Through HMD

Video See-Through AR uses an opaque HMD to display merged video of the VE and view from cameras on the HMD (Figure).



## 2.4 Monitor Based

Monitor Based AR also uses merged video streams but the display is a more conventional desktop monitor or a hand held display. It is perhaps the least difficult AR setup, as it eliminates HMD issues.



## 2.5 Projection Displays

Projector Based AR uses real world objects as the projection surface for the virtual environment



## 3. Goals of Augmented Reality

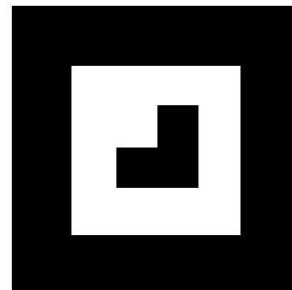
- To challenge the impossible.
- To create virtual environment for a more rich user experience.
- To integrate it into daily lives to help the masses.
- To achieve feats which are limited in real world.
- To enhance imagination of youths.

## 4 TYPES

Augmented Reality can be categorize in two.(1) Marker based ;(2) Marker less.

### 4.1 Marker Based AR:

Marker based which uses camera and virtual cues. Different type of AR marker is available which are images that can be detected by camera and by using particular software we can place the virtual object in real world. Markers are of many types like colour or black and white but mostly black n white markers are used more. A marker can contain one or more shapes made up of Black Square against white background. Some disadvantages of this type of AR marker is the software that is used to detect the marker



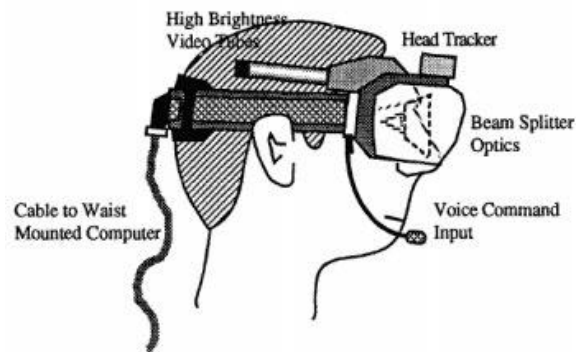
#### 4.2 Marker less AR:

Marker less Augment Reality the images are gathered through internet and displayed on particular location (can be gathered using GPS) .Here marker is not required to display the content. It is more effective than marker based augmentation.



#### 5 PROBLEM STATEMENT

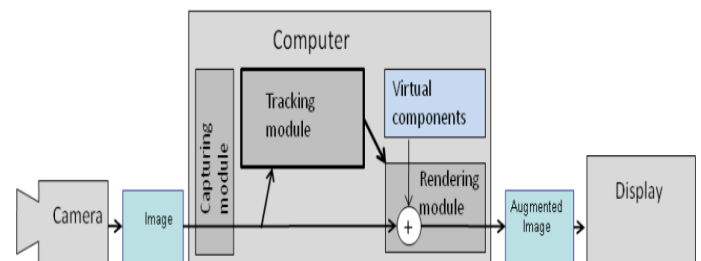
The proposed system provides an environment that permits the user to place a virtual object in real world with the help of Augmented Marker. It also allows the user to decide the location or place where the virtual object needs to be placed in real world. The main drawback of previous system is they were costly and some of them are heavy also like HMD devices, and these devices were not potable also.



#### 6 PROPOSED SYSTEM

System Architecture:

1. The capturing module captures the image from the camera.
2. The tracking module calculates the correct location and orientation for virtual overlay.
3. The rendering module combines the original image and the virtual components using the calculated pose and then renders the augmented image on the display.
4. The tracking module is “the heart” of the augmented reality system; it calculates the relative pose of the camera in real time.
5. The term pose means the six degrees of freedom (DOF) position, i.e. the 3D location and 3D orientation of an object.
6. The tracking module enables the system to add virtual components as part of the real scene



#### 7.APPLICATION

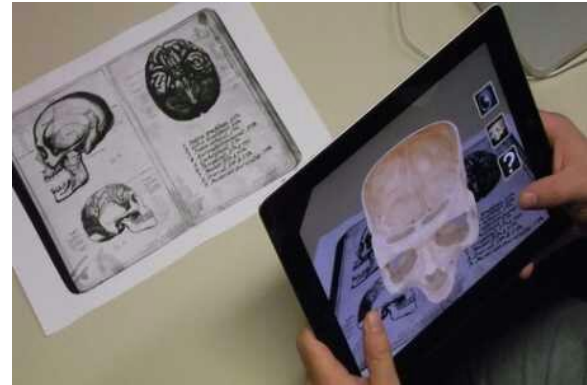
Augmented Reality has various applications some of them are stated as below:

##### 7.1 Medical

Augmented Reality has various applications and its also being used for medical.



Most of the medical applications deal with image guided surgery



### 7.2 Archaeology:

AR can be used for archaeology research, by augmenting archaeological features onto the modern landscape, allowing archaeologists to formulate conclusion about site placement and configuration.



### 7.3 Education:

AR application can complement a standard curriculum. As till now we were studying by using our traditional techniques like reading through text books, articles. To make studying more interesting we started using internet where we just have to type some queries and the answer is just front of us. But augmented reality has bought a drastic change in education field also where text books, flashcards and other educational reading material can contain embedded "markers" that when scanned by an AR device, produce information in a multi-media format.

### 7.4 Emergency Management/Search and Rescue:

AR system is used in public safety situations from super stom to suspects at large.



### 7.5 Architecture:

AR can assist in visualizing building projects. Computer-generated images of a structure can be placed into a real life, local view of a property before the physical building is constructed there.

### 7.6 Fashion

As we all love shopping so instead of trying cloths and accessories ,the Augmented Reality has provide an application for the user, which will help the user with what suits.



## 7.7 Military

The military has been using displays in cock-pits that present information to the pilot on the windshield of the cockpit or the visor of the flight helmet.



## 8.CONCLUSION

This paper proposes a marker based augmented reality application using Android operating system which will help to combine virtual objects with the real environment.

## 9.FUTURE SCOPE

As in our project we have developed an application using Android phones and marker based augmented reality. Presently we are using single marker and showing virtual object in real world, but we will try to use multiple marker.

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