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Augmented Reality: Applications and Its Future Scope

Bushra D. Qureshi [1], S. A. Ladhake [2], V. K. Shandilya [3]
[1] *Computer Science & Engineering Department, Sant Gadge Baba University, Amravati*

Abstract: Augmented reality is interactive, powerful and versatile technology that fuses real world and digital world into one. Augmented Reality is a very useful tool in everyday life. It enhances all the things around us. It changes the way we see, imagine and learn about the world. Augmented Reality enhances user's view and interaction of the real world. This paper overviews the basic concept of augmented Reality and describes applications in wide range of fields such as education, entertainment, health care, tourism, business and much more. This paper also provides future scope of augmented reality.
***Keywords**: Augmented reality, Applications, Smart Education, Environment, Android.*

I. INTRODUCTION

Augmented Reality (AR) is the technology that magnifies our physical world adding more information onto it. It has quickly become one of the hottest trends across the world. Augmented reality can be used in almost every field and has limitless power and potential. The term augmented is coined from the word augment which means to add or to enrich something. AR is used to create an environment in which user cannot tell the difference between real world and computer-generated extension of it. AR shadows the line between imagined world and reality. Augmented reality technology is having a capability to provide real-time interaction between physical and virtual world. AR gives users more information about their environments. AR not only creates an imitation environment, but also it can play with the existing one and overlaps new features on it.

II. APPLICATIONS

A Several new and emerging application areas of AR which impact our lives are presented as follows:

A. Smart Education

The AR is growing at a very fast rate in education sector. With the help of this technology, the education models will help students and teachers to understand the topic well. AR acts as a fun element in education. Through various ways it grants students digital information to understand any subject in an easy, interactive and efficient manner, thus making complex information easier to understand. Thus the student's experience is highly visual, pictorial and interactive. AR changes the learning environment of children and it also ignites their mind to further discover all the things in the world. As shown in the fig below the blippar app visualizes topics and objects from printed material and turning it into 3D interactive models.

Fig 1. Blippar

B. Medical

The AR technology in Medical is rising speedily and has revolutionised medical and health care industry by various significant developments and innovations. With the help of this technology, both patients and doctors can make more informed healthcare decisions thus leading to better quality of life. This technology is making patient's life safer and it is also making doctors more skilled in early detection of various diseases. It is making medical treatment easier, effective and accurate.
Some apps which have been developed are AccuVein is simple and useful AR app which is used to locate veins in the human body.

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Holo Eye anatomy app is used to study the human eye structure in detail and works exclusively on the Microsoft HoloLens.
Eye Decide is simple app which is used to educate patients on the disorder of their eyes.

Fig 2. AccuVein : used to locate veins

C. Movie

The AR technology will help in renewing the entire movies and entertainment sector. By using this technology, you will no longer only see movies. Relatively, you will be able to feel the motions of the movies. AR combined with a good sound system will make you feel in sync with the location of the movie. Some examples of the movies are Avatar , Iron Man, Wall-e etc. To get a sight of the new movie, movie admirers can just point a mobile phone at a movie poster, city light, trailer or ads. Immediately, they will get more information about the movie and enjoy interactive experience. One such app is Roar app.

D. Military

The Heads-Up Mounted Display (HMD) is an example of AR app related to military applications. Augmented Reality displays can focus troop activities and their movements and provide hidden place for them in the proximate surroundings. The military has been using displays and various devices that present digital information to the pilot. From the soldier's point of view, people and various objects will be marked with special indicators to warn against dangers and enemies.

E. Maintenance and Repair:

For workers to provide maintenance, evolving products such as SCOPE AR and CSIRO's own remote allow specialists to provide stepwise instructions directly. AR can also be extremely helpful when relating with the complex machines, apparatus and structures. When a mechanic is repairing an engine, the person can see overlaid image in his real line of sight.

F. Advertising

AR technology has opened up an innovative way for organisations to market their products and items. AR advertisements are becoming the future of advertising thus attracting customers more and more. Many more companies on daily basis are starting to use AR for their advertising purposes. Using AR the advertisements gives a magical experience that snatches a person's attention thus drawing it to the marketing message.

G. Gaming

Gaming is the only industry that has make use of the potential of AR at its best. AR games are generally played on smartphones, tablets and other portable gaming systems. This technology has changed the way people have played games till now. With the release of several apps among which the app Pokémon Go, developed by Niantic, users have got experience of playing an augmented reality game. You have to step out of the house with your device, play game and see your favourite characters coming active on the screen of the device. AR games create a captivating experience among the users by providing the game with enriched effects thus making games more fun and interesting to play. Other popular games are Bee Ready, Ingress, Domino World, Zombie Go, Real strike etc.

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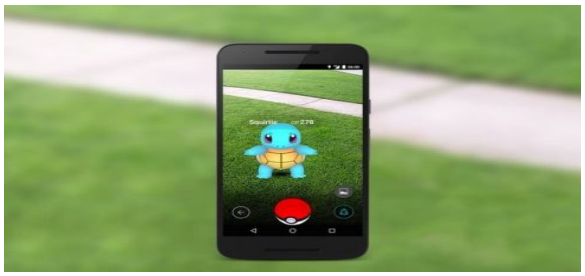

Fig 3. Pokémon Go Game

H. Tourism and Sight-seeing:

The augmented reality has transformed the sightseeing and tourism industries. Tourism is a flourishing industry that allows people to discover experience and enjoy destinations. AR technology is modernizing the traveler's experience by making planning journey much more smooth, interactive and simple. With the help of smartphone, tourists have the ability to walk through historic places and see facts and figures which will be overlaid on their live screen. Applications will not only provide information about a historic place but also even show how the location looked back 10,50 or even 100 years ago.

I. Navigation

Navigation applications are perhaps the most natural and suitable example of augmented reality with our everyday lives. AR uplifts the navigation maps by adding digital components such as arrows, directions and information to the map. GPS has become so prevalent that most people couldn't live without it. Enhanced GPS systems use augmented reality making it easier for users to get from one point to another. Users can access details about nearest places kin to current location. With the help of the smartphone's GPS, users see the particular route over the alive view of what is in front of the vehicle.

J. Construction

AR has a treasure of design and construction uses further than visualization too. In the construction industry, buildings and infrastructures are designed using 3D modelling software but they are built using 2D plans. Bentley Systems has been presuming out various methods to use AR technology to help to make the abstract link between the 2D plans and the 3D design. AR can also be used to show customers and investors various options in a natural and interactive way. Clients can also get involved during the design phase so as to request the changes in the design.

K. Social Media

AR has made noteworthy changes to the way we communicate, create and share through social media. On social media, Snapchat's face filters are possibly the first thing that comes to our mind in case of Augmented reality technology. Snapchat is the leading way with the new AR feature that allows users to project themselves or images into the real world through smartphones. Social media apps using augmented reality can attract multiple users with its exclusive features. The AR technology modernizes the world of mobile-phone users and technology.

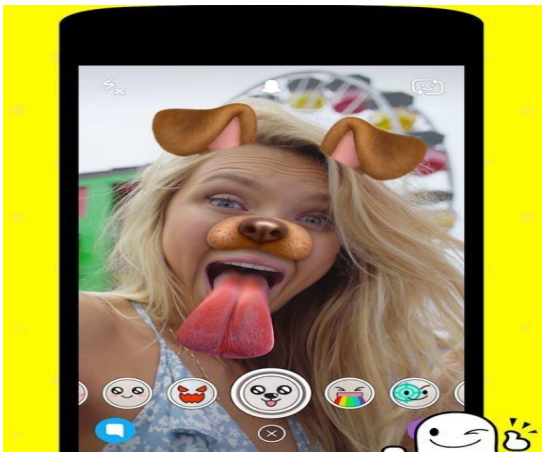

Fig 4. Snapchat face filter

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L. Shopping

In shopping, Augmented reality lets customers view colours, sizes and dimensions of various lifestyle products like clothes, home furnishings, jewellery etc. Thus AR provide information in detail about the product so that user can buy with confidence. AR apps act as a customer service assistants digitally and provide shoppers with information on various products and items. In online shopping, customers can learn more about their options and get instant approvals. Mostly all the buyers are influenced by web based reviews and social content. So by using AR technology user can overlay the feedback, review and other digital information to the real world. The AR fitting room attract customers to find their best look thus providing smooth experience.

Fig 5. Kinect fitting room page style

III. FUTURE SCOPE

Augmented reality is making it really big all across the world. The future looks really bright as more and more companies are keen to jump on the craze by taking up this innovative and hi-tech technology. AR is certainly on skyline and in 2018 we're bound to see the growth on this path. This past year has been a very big year for the augmented reality technology. Google has yet again shined in AR. This year Google has launched ARCore, an augmented reality kit, that will enable developers to create AR apps for Android devices easily. Microsoft's HoloLens headset and the upcoming Windows Mixed Reality operating system indicate their strong existence in both AR and VR space. In 2019 we can only expect this technology to flourish amongst the people and have a strong positive impact in various other fields. There are many other technologies being developed that do embrace augmented reality as a more enclosed component. Surely, things are going to improve much in times to come thus making our life easier to live.

IV. CONCLUSION

We reviewed the concept of augmented reality and its applications in various area and fields. We have only learned the verge of the AR technology yet. The combination of AR with other innovative technology is sure to find more amazing usage. Along with AR, virtual reality (VR) is also a useful technology to transform real world into virtual view for the user. Both technologies are good but AR is successful commercially and recent developments show that virtual reality is also developing briskly. Thanks to the technologies such as augmented reality the way we look and work with the computing devices. Top Companies around the world are already proving the potential for using AR to solve world's problems and needs.

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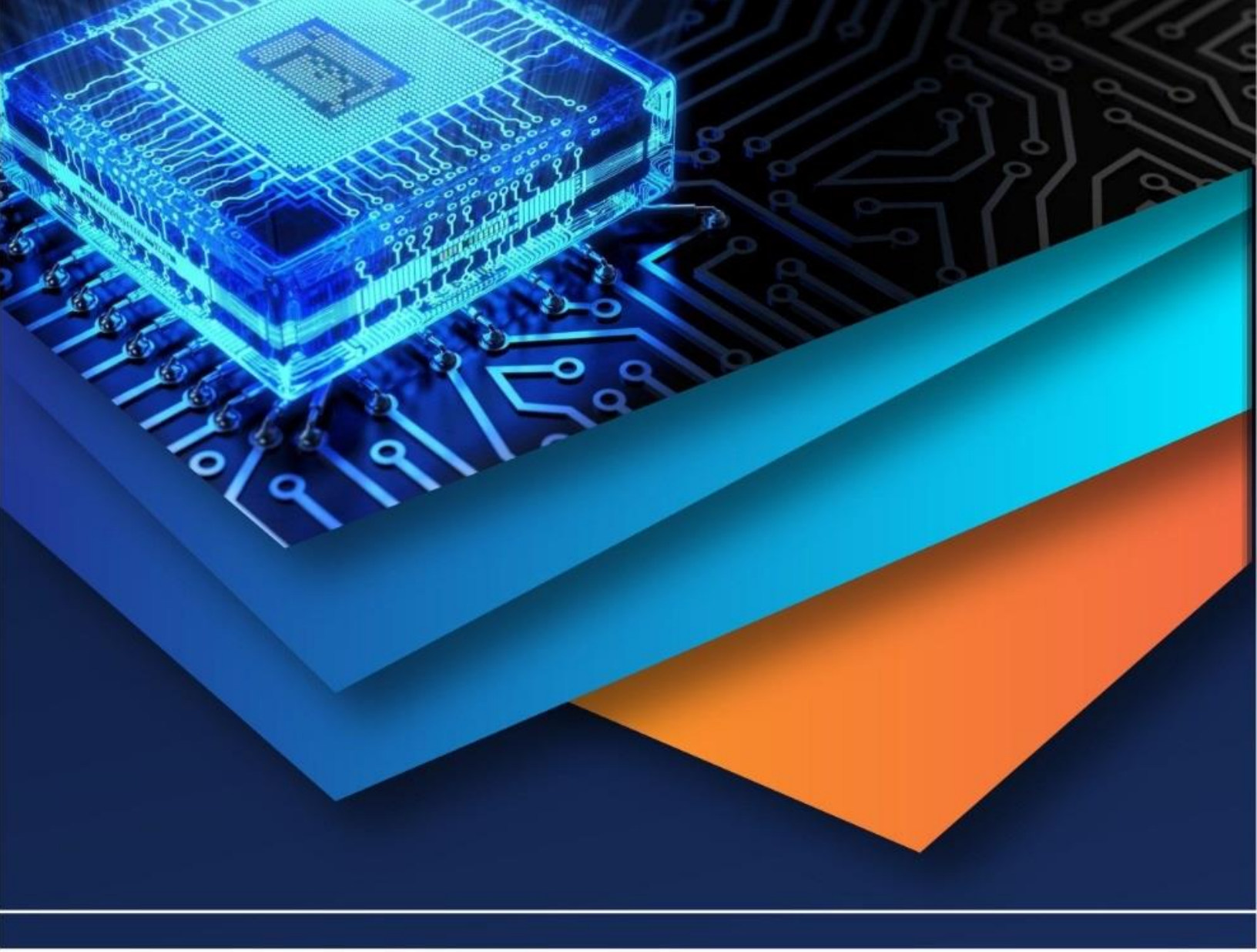

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