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# SEMINAR REPORT ON

# AUGMENTED REALITY

***The Seminar report was done in partial fulfilment of the requirements for the award of Degree of Bachelor of Computer Application***

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# CERTIFICATE

This is to certify that the Seminar report entitled “**AUGMENTED REALITY**” is a bonafide report of the Semester done by **FATHIMA SALIM,Reg No: 200021091020** in partial fulfilment of requirements for the award of degree of Bachelor of Computer Application from Mahatma Gandhi University, in MARCH 2023.

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Submitted for the viva voice on:……………………….

### ACKNOWLEDGMENT

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# DECLARATION

I, hereby declare that the Seminar work entitled ‘**AUGMENTED REALITY**’, is an authenticated work carried out under the guidance of **Mrs.ANITHA MATHEW** Assistant Professor, for the partial fulfilment of the award of the degree of **Bachelor of Computer Application** and this work has not been submitted for similar purpose anywhere else expect to **MES College Erumely**, affiliated by **Mahatma Gandhi University Kottayam.**

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**AUGMENTED REALITY**

# ABSTRACT

This paper describes the various Night vision techniques. "Night Vision" is referenced as technology that provides us with the miracle of vision in total darkness and the improvement of vision in low light environments. This technology is an amalgam of several different methods each having its own advantages and disadvantages.

The most common methods described here are Low-Light Imaging, Thermal Imaging and Illumination.This paper also give brief idea about various night vision device (NVD) that allows images to be produced in levels of light approaching total darkness, it also explains various applications where night vision technology is used to solve various problems due to low light conditions.Whether by biological or technological means, night vision is made possible by a combination of two approaches: sufficient spectral range, and sufficient intensity range. Humans have poor night vision compared to many animals, in part because the human eye lacks a tapetum lucidum.

A night vision device (NVD) is an optical instrument that allows images to be produced it levels of light approaching total darkness. They are most often used by the military and law enforcement agencies, but are available to civilian users. The term usually refers to a complete unit, including an image intensifier tube, a protective and generally water-resistant housing, and some type of mounting system. Many NVDs also include sacrificial lenses, IR illuminators, and telescopic lenses. Night vision devices were first used in World War II, and came into wide use during the Vietnam War. The technology has evolved greatly since their introduction, leading to several "generations" of night vision equipment with performance increasing and price decreasing.

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### ,1.INTRODUCTION

Augmented Reality (AR) is a growing area in virtual reality research. The world environment around us provides a wealth of information that is difficult to duplicate in a computer. This is evidenced by the worlds used in virtual environments, Either these worlds are very simplistic such as the environments created for immersive entertainment and games, or the system that can create a more realistic environment has a million-dollar price tag such as flight simulators. An augmented reality system generates a composite view for the user.

It is a combination Of the real scene viewed by the user and a virtual scene generated by the computer that augments the scene With additional information. In all those applications the augmented reality presented to the user enhances that person's performance in and perception ofthe world. The ultimate goal is to create a system such that the user cannot tell the difference between the real world and the virtual augmentation Of it. It depicts the merging and correct registration Of data from a pre-operative imaging study onto the patient's head. Providing this view to a surgeon in the operating theater would enhance their performance and possibly eliminate the need for any other calibration fixtures during the procedure.

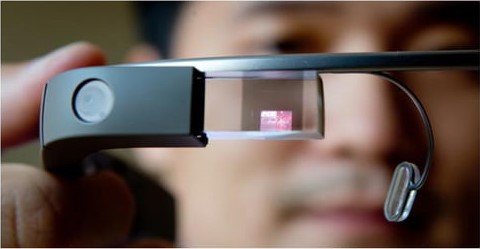


Fig.1 A Device

# 2.What is AR?

The process Of superimposing digitally rendered images onto our real-world surroundings, giving a sense Of an illusion or virtual reality. Recent developments have made this technology accessible using a smartphone.

# 3.HOW IT IS USED?

Augmented reality is hidden content, most commonly hidden behind marker images, that can be included in printed and film media. as long as the marker is displayed for a suitable length Of time, in a steady position for an application to identify and analyze it. Depending on the content, the marker may have to remain visible.

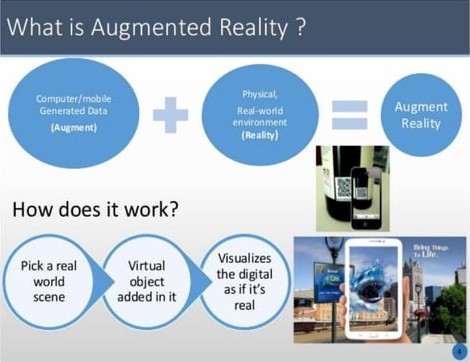
It is used more recently by advertisers where it popular to create a 3D render of a product, such as a car. or football boot, and trigger this as an overlay to a marker. This allows the consumer to see a 360-degree image (more or less, sometimes the base of the item can be tricky to of the product. Depending on the quality of the augmentation, this can go as far as indicating the approximate size of the item and allow the consumer to 'wear the item, as viewed through their phone.

Alternative setups include printing out a marker and holding it before a webcam attached to a computer. The image Of the marker and the background as seen by the webcam is shown on screen, enabling the consumer to place the marker on places such as the forehead (to create a mask) or move the marker to control a character in a game.

# 3.HOW IT IS WORKED

Using a mobile application, a mobile phone's camera identifies and interprets a marker, Often a black and white barcode image. The software analyses the marker and creates a virtual image overlay on the mobile phone's screen, tied to the position of the camera. This means the app works With the camera to interpret the angles and distance the mobile phone is away from the

Due to the number of calculations a phone must do to render the image or model over the marker, Often only smart phones are capable ofsupporting augmented reality With any success. Phones need a camera, and ifthe data for the AR is not stored within the app, a good 3G Internet connection.



**Fig.2 process**

# 4.HISTORY

The beginnings ofAR, as we define it, date back to Sutherland's work in the 1960s, Which used a see-through HMO to present 3D graphics. However, only over the past decade has there been enough work to refer to AR as a research field. In 1997, Azuma published a survey that defined the field, described many problems, and summarized the developments up to that point. Since then. AR's gmwth and progress have been remarkable.

In the late 1990s, several conferences on AR began, including the international Workshop and

Symposium on Augmented Reality, the International Symposium on Mixed Reality, and the Designing Augmented Reality Environments workshop. Some well-funded organizations formed that focused on AR, notably the Mixed Reality Systems Lab in Japan and the Arvika consortium in Germany.

# 5.Applications

Main classes of applications:

l. Medical

1. Manufacturing and repair
2. Annotation and visualization
3. Robot path planning
4. Entertainment
5. Military aircraft

# 6.Augmented Reality vs. Virtual Reality

### Augmented Reality

AUGMENTED REALITY

System augments the real-world scene

* User maintains a sense of presence in real world
* Needs a mechanism to combine virtual and real worlds

VIRTUAL REALITY

* Totally immersive environment
* Senses are under control of system
* Need a mechanism to feed virtual world to user

# 7.IMPLIMENTATION FRAMEWORK

### Implementation Framework

## Hardware

The main components of our system are a computer (with 3D graphics acceleration). a GPS system originally differential GPS, and now real-time kinematic GPS+GLONASS, a seethrough head-worn display With orientation tracker, and a wireless network all attached to the backpack. The user also holds

a small stylus-operated computer that can talk to the backpack computer via the spread spectrum radio

channel. Thus we can control the material presented on the head wom display from the handheld screen.

We also provide a more direct control mechanism of a cursor in the head worn display by mounting a track pad on the back of the handheld display where it can easily be manipulated (we inverted the horizontal axis) While holding the display upright.

To make the system to be as lightweight and comfortable as possible, off-the-shelf hardware can be used to avoid the expense, effort, and time involved in building our own, Over the years, lighter and faster battery-powered computers With 3D graphics cards, and finally graduated to laptops With 3D graphics processors.

**SOFTWARE**

### Software

Software infrastructure Coterie, a pmtotyping environment that provided language-level support for

distributed virtual environments. The main mobile AR application ran on the backpack computer and received continuous input from the GPS system, the orientation head tracker, and the track pad (mounted on the back Of the handheld computer). It generated and displayed at an interactive frame rate the overlaid 3D graphics and user interface commonents on the head worn display.

In the handheld computer we ran arbitrary applications that talked to the main backpack application via Coterie/Repo object communications. In our first prototype. we simply ran a custom 111TP server and a web browser on the handheld computer, intercepted all URL and link selections, and thus established a two-way communication channel between the backpack and the handheld.

### Advantages

Augmented reality (AR) is a view provided by virtual computer-generated imagery Ofa mixed reality in Which real and virtual worlds interact in real-time. Advantages and disadvantages ofthe technology are listed below. Please comment based on your experience with augmented reality.

# 8. ADVANTAGES & DISADVANTAGES OF AR

#### Advantages Of AR

* Can increase knowledge and information
* People can share experiences With each Other in real time over long distances
* Games that provide an even more "real" experience
* Things come to life on people's mobile

Disadvantages of AR

* Spam and Security
* Social and Real-Time vs. Solitary' and Cached

UX (User Experience): Using AR can be inappropriate in social situations.

* Interoperability. The lack of data portability between AR environments (such as

Wikitude AR and Layar AR browser).

* Openness: Other people ean develop their own layers ofcontent to display

### Issues in Augmented Reality

#### • Performance Issues

Real time processing Of images can be a challenge and Often can slow down augmented reality systems.

#### • Interaction Issues

Users within a mixed environment because of augmented reality have difficulties interacting with the environment as normal.

#### • Alignment Issues

people working in an augmented reality are more sensitive to alignment errors. proper calibration and alignment With the reference frame Of the world is crucial.

# 9.CHALLENGES

Technological limitations

Although there is much progress in the basic enabling technologies, they still primarily prevent the deployment of many AR applications. Displays, trackers, and AR systems in general need to become more accurate, lighter, cheaper, and less power consuming. Since the user must wear the PC, sensors, display, batteries, and everything else required, the end result is a heavy backpack. Laptops today have one CPU, limiting the amount Of Visual and hybrid tracking that We Can do.

### User interface limitation

We need a better understanding Of how to display data to a user and how the user Should interact with the data. AR introduces many high•level tasks, such as the need to identify what information Should be provided, What'S the appropriate representation for that data, and how the user Should make queries and reports. Recent work that the creation and presentation of narrative performances and Structures may lead to more realistic and richer AR experience.

### Social acceptance

The final challenge is social acceptance. Given a system with ideal hardware and an intuitive interface, how AR can become an accepted part of a uses everyday nfe, just like a mobile phone or a personal digital assistant. Through films and television, many people are familiar with images of simulated AR. However, persuading a user to wear a system means addressing a number Of issues. These range from fashion to privacy concerns. TO date, little attention has been placed on these fundamental issues. However, these must be addressed before AR becomes widely accepted.

# 10.CONCLUSIONS

Augmented reality is another Step further into the digital age as we Will soon see our environments change dynamically either through a Smartphone, glasses, car windshields and even windows in the near future to display enhanced content and media right in front of us. This has amazing applications that can very well allow us to live our lives more productively, more safely, and more informatively

Maybe in the future, we will see our environments become augmented to display information based on our own interests through built-in REID tags and augmentations being implemented through holographic projections surrounding the environments Without a use Of an enabling technology. It Would be incredible to no longer wonder where to eat, where to go, or What to do; our environment Will facilitate our interactions seamlessly. We Will no longer be able to discern what is real and what is virtual, our world will become a convergence of digital and physical media.

# 11.REFERENCES



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