



**SANDIP**  
UNIVERSITY

# **AUGMENTED REALITY IN EDUCATION : A SURVEY**

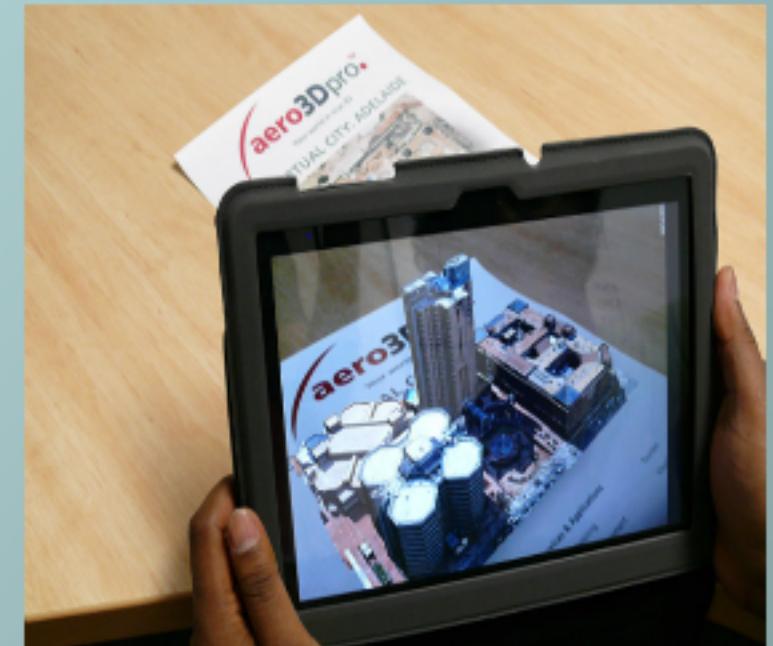
**PRESENTED BY :**  
**DUSANE ASHISH CHANDRAKANT**  
**M.TECH, ACDS**

## OUTLINE

- Introduction
- AR in Education : In Engineering Graphics
- Motivation
- Objectives
- System Architecture
- AR in Education : In Medical
- Literature Review
- Conclusion
- Reference

## INTRODUCTION

- Augmented reality is a term for a live direct or an indirect view of a physical (real) - virtual environment whose elements are augmented by computer generated sensory input.
- The sensory inputs can be sounds or graphics.
- Briefly, it is a layer of virtual elements on the real world.



source : [http://aerometrex.com.au/blog/wp-content/uploads/2013/01/AR\\_aero3dpro-1024x664.jpg](http://aerometrex.com.au/blog/wp-content/uploads/2013/01/AR_aero3dpro-1024x664.jpg)

# *Augmented Reality*

# *Virtual Reality*



**Virtual Reality (VR)** is an artificial, computer-generated simulation or recreation of a real life environment or situation. It immerses the user by making them feel like they are experiencing the simulated reality firsthand.

Virtual reality is possible through a coding language known as VRML (Virtual Reality Modeling Language).

**Augmented Reality (AR)** is a technology that layers computer-generated enhancements atop an existing reality in order to make it more meaningful through the ability to interact with it. AR is developed into apps and used on mobile devices to blend digital components into the real world.

# AUGMENTED REALITY IN EDUCATION : IN ENGINEERING GRAPHICS

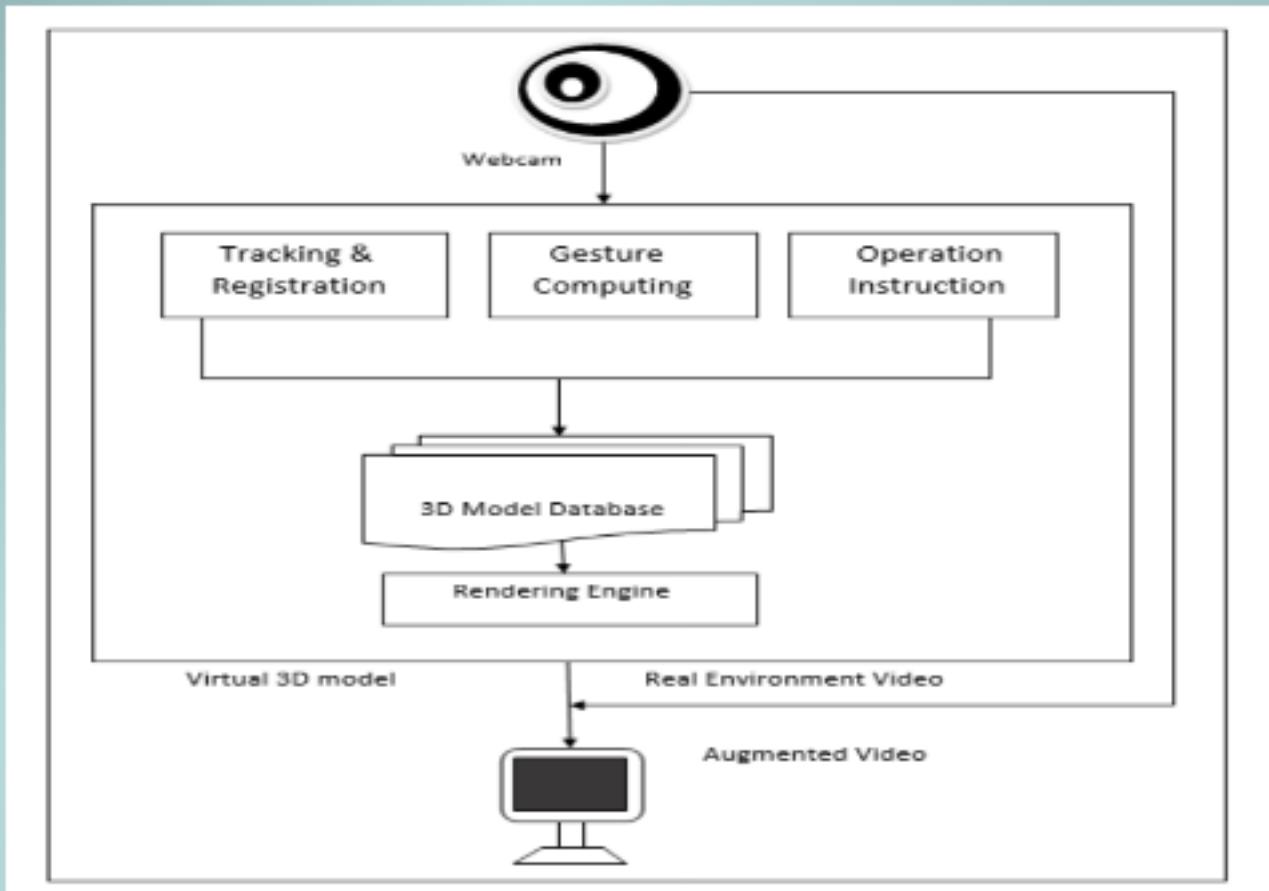


## MOTIVATION

As students, most of us have faced many difficulties in studying engineering graphics. So, keeping this intention in mind, a system is proposed to help student, overcome their difficulties in engineering graphics.



# SYSTEM ARCHITECTURE



## **DESCRIPTION OF MODULES**

**1) Tracking and Recognition**

**2) Gesture Computing**

**3) Operation Instruction**

**4) 3D Model Database**

**5) Rendering Engine**



source : Desktop vs. Mobile: A Comparative Study of Augmented Reality Systems for Engineering Visualizations in Education



Fig. 1. Examples of AR markers embedded in the graphics materials

# AUGMENTED REALITY IN MEDICAL



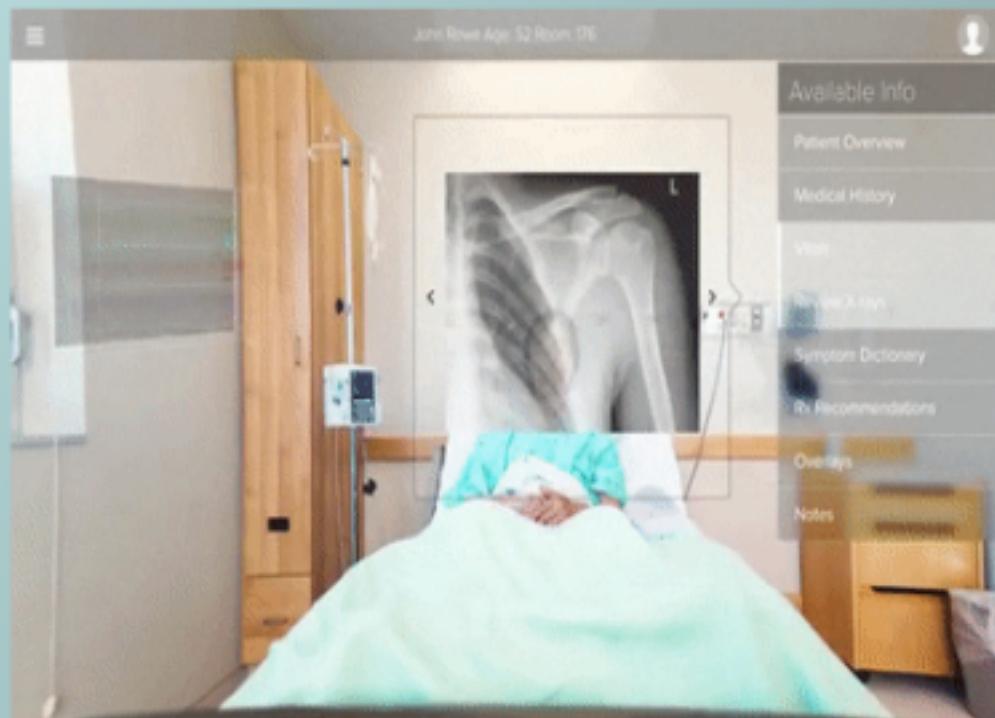
source : <https://infinityleap.com/wp-content/uploads/2015/12/Augmented-Reality-Is-Expected-To-Assist-Surgeon.jpg>

# MEDICAL SURGERY

- Medical students use AR technology to practice surgery in a controlled environment.
- Visualizations aid in explaining complex medical conditions to patients. Augmented reality can reduce the risk of an operation.
- This technology can be combined with MRI or X-ray systems and bring everything into a single view for the surgeon.



MakeAGIF.com



## LITERATURE REVIEW

Sr. No.	Paper Title	Authors	Type	Remarks
1	<b>Review of Augmented Reality Agent in Education</b>	Bimo Sunarfri Hantono, Lukito Edi Nugroho, P. Insap Santosa	6th International Annual Engineering Seminar (InAES), Yogyakarta, Indonesia. IEEE, 2016	Augmented reality technology is able to provide a layer of virtual information that may include images, text, video, and audio over interactive real world objects in real time and registered in 3D. Augmented reality can support smooth interaction between real and virtual environments. Augmented reality technology has also gained attention in education because of its ability to bridge the gap and bring more tangible approach to learning experience.

## LITERATURE REVIEW

Sr. No.	Paper Title	Authors	Type	Remarks
2	<b>Incorporating Augmented Reality Content in Engineering Design Graphics Materials</b>	Jorge Camba, Manuel Contero, Gustavo Salvador-Herranz	IEEE, 2014	Engineering design graphics play a fundamental role in the engineering product development cycle. From an academic standpoint, the development of 3D spatial skills has been cited and recognized by key factor in many scientific and technical disciplines. Studies have consistently shown that proper spatial skills are directly related to academic success in science, technology, engineering, and mathematics. Additionally, the ability to create professional engineering drawings are common requirements both in upper-level capstone design courses and certainly in industry.

## LITERATURE REVIEW

Sr. No.	Paper Title	Authors	Type	Remarks
3	<b>Desktop vs. Mobile: A Comparative Study of Augmented Reality Systems for Engineering Visualizations in Education</b>	Jorge Camba, Manuel Contero	IEEE, 2014	Engineering graphics and 3D visualization are key elements in most scientific and technical disciplines. In engineering education, the development of spatial abilities has been acknowledged factor that is strongly related to higher-level reasoning skills, critical thinking, creativity, and success in STEM (science, technology, engineering, and mathematics) fields. Spatial visualization is a term that refers to the aptitudes needed to mentally process three-dimensional information. It is a high-level learning objective often seen in engineering graphics curricula

# **OTHER USE CASES OF AUGMENTED REALITY**



**FOR COMPANIES**  
introduce your brochures, promotions,  
share your news feed and projects with  
your consumers

## Marketing : Business Card



## Gaming : Pokeman Go

# 'AR' IN CIVIL EDUCATION



(a)



(b)



(c)



(d)

*Figure 4: Applications of AR in the field of ACE (Architecture, Construction and Engineering).*

## **CONCLUSION**

The purpose of this study is to give an overview of the functionality of Augmented Reality in Education & Engineering Graphics System. Most of the systems use virtual reality and its applications. Hence it is found that using augmented reality in learning process increases the ability to learn and helps to grasp better.

## REFERENCES

- [1] Bimo Sunarfri Hantono, Lukito Edi Nugroho, P. Insap Santosa. "**Review of Augmented Reality Agent in Education**" 2016 6th International Annual Engineering Seminar (InAES), Yogyakarta, Indonesia, IEEE 2016
- [2] Jorge Camba, Manuel Contero, Gustavo Salvador-Herranz. "**Desktop vs. Mobile: A Comparative Study of Augmented Reality Systems for Engineering Visualizations in Education**", IEEE 2014
- [3] Jorge Dorribo-Camba, Manuel Contero. "**Incorporating Augmented Reality Content in Engineering Design Graphics Materials**", IEEE 2014
- [4] Olivier Pauly, Benoit Diotte, Pascal Fallavollita, Simon Weidert, Ekkehard Euler, Nassir Navab. "**Machine learning-based augmented reality for improved surgical scene understanding**", Elsevier Journal, 2015 Computerized Medical Imaging and Graphics 41 (2015)
- [5] Mehdi Mekni, Andr'e Lemieux. "**Augmented Reality: Applications, Challenges and Future Trends**", Applied Computational Science, 2016
- [6] Dhara Parmar, Krupali Pelmahale, Prof. Pankaj Badgujar, "**Augmented Reality System for Engineering Graphics**", International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 10, October 2015



Thank you!



