



**RAJIV GANDHI**  
INSTITUTE OF TECHNOLOGY



# AUGMENTED REALITY

Academic Seminar 17CSS86

+ **DEPARTMENT OF** COMPUTER SCIENCE &  
ENGINEERING





WHAT IS AR



EVOLUTION



STRATEGY



APPLICATIONS



OUTCOME



EXAMPLES



# ACCOMPANIMENTS



**Mrs. Pushpalata Dubey**  
**Asst. Professor**



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01.

WHAT IS AR



WHAT IS AR



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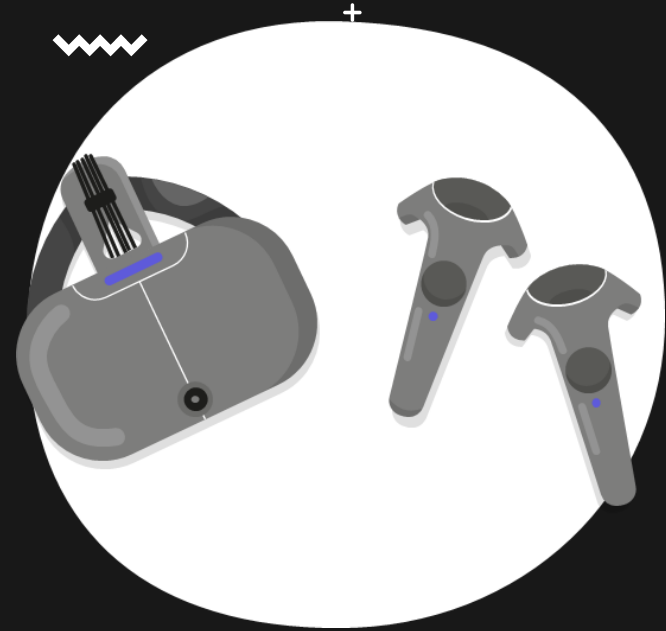
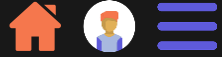
EXAMPLES

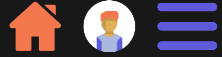


# WHAT IS AR

The increased reality (AR) is a vision of the actual, physical world in which users may locate + computer-generated input enhanced features. Designers create inputs from sounds to videos, images to GPS overlay and more, digital material that responds to user environment changes in real time. Augmented reality merges digital content and physical information – as if in your own place they were really with you. AR brings up new opportunities for your gadgets to help you with digital material as much as you experience the world all day long. It lets you search things visually, simply by pointing your camera at them.

+





# 3 FEATURES OF AR

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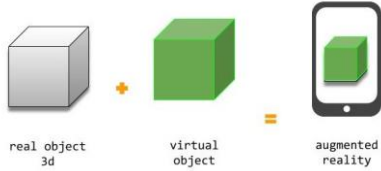
OUTCOME



EXAMPLES



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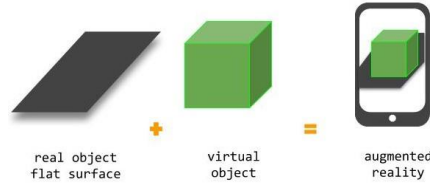


REAL OBJECT 3D

+

VIRTUAL OBJECT

+



REAL OBJECT SURFACE

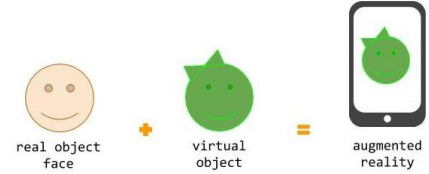
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VIRTUAL OBJECT

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REAL OBJECT FACE

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VIRTUAL OBJECT



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OUTLOOK



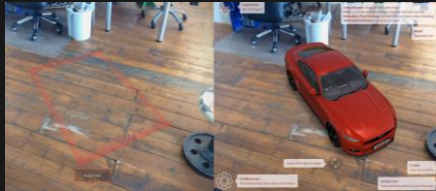
EXAMPLES



# TYPES OF AR



MARKER-BASED AR



MARKERLESS AR



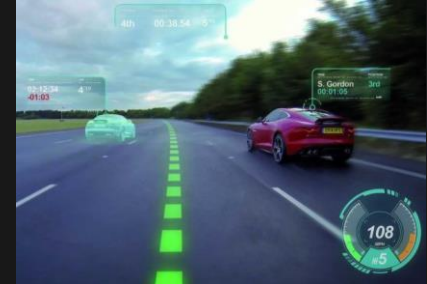
LOCATION-BASED AR



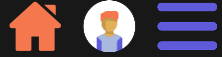
SUPERIMPOSITION AR



PROJECTION-BASED AR



OUTLINING AR





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# CORE ASSETS

## VR HEADSET

Halo headband - The advanced hardware software innovations to render smooth display

## TOUCH CONTROLLERS

Slashes, throws and grabs appear in VR with intuitive, realistic precision.



## SMART GLASSES

To remain hands-free, to get a visual access to a narrow area, or to occasionally contact someone, an adapted solution is at the reach.





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# <sup>+</sup>COMPONENTS FOR WORKING OF AR<sup>+</sup>

## HARDWARE

- + Processor
- Graphic Processing Unit (GPU)
- Sensors
  - Depth Sensor
  - Gyroscope
  - Proximity Sensor
  - Accelerometer
  - Light Sensor

## SOFTWARE

Examples :  
ARkit for Apple  
Arcore for Android

Environment understanding  
Motion Tracking  
Light estimation

+

## APPLICATION<sup>~~~~~</sup>

The AR features such as the 3D objects and filters come from the mobile applications themselves. Applications such as Snapchat, Pokemon GO, and IKEA Place have their own database of virtual images and triggering logic. These applications pull virtual images from their database and map them out onto the live images. +



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# TECHNOLOGY IMPLEMENTATION

**SLAM** : SLAM stands for simultaneous localization and mapping technology. It is based on a set of complex algorithms and data received from sensors. So, SLAM maps unknown environments and determines its localization simultaneously.

**MARKERS** : Marker-based AR or image recognition uses a mobile device camera to detect a predefined marker that then triggers a certain computer-generated content. Markers can be AR-codes, physical objects, or printed images. To enable the AR app to recognize a real-world object as a trigger, a certain marker should be embedded into this object. As soon as a marker appears within a camera scene, the software calculates the position of both a marker and displayed content. Therefore, a change of the real-world object position will influence the position of the computer-generated content.

**POSITION** : To determine where to place additional digital information, position-based AR apps rely on GPS data, mobile device built-in compass, accelerometer, and gyroscope. It is also known as location/position-based augmented reality.



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SCOPE



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# 02.

## EVOLUTION OF AR



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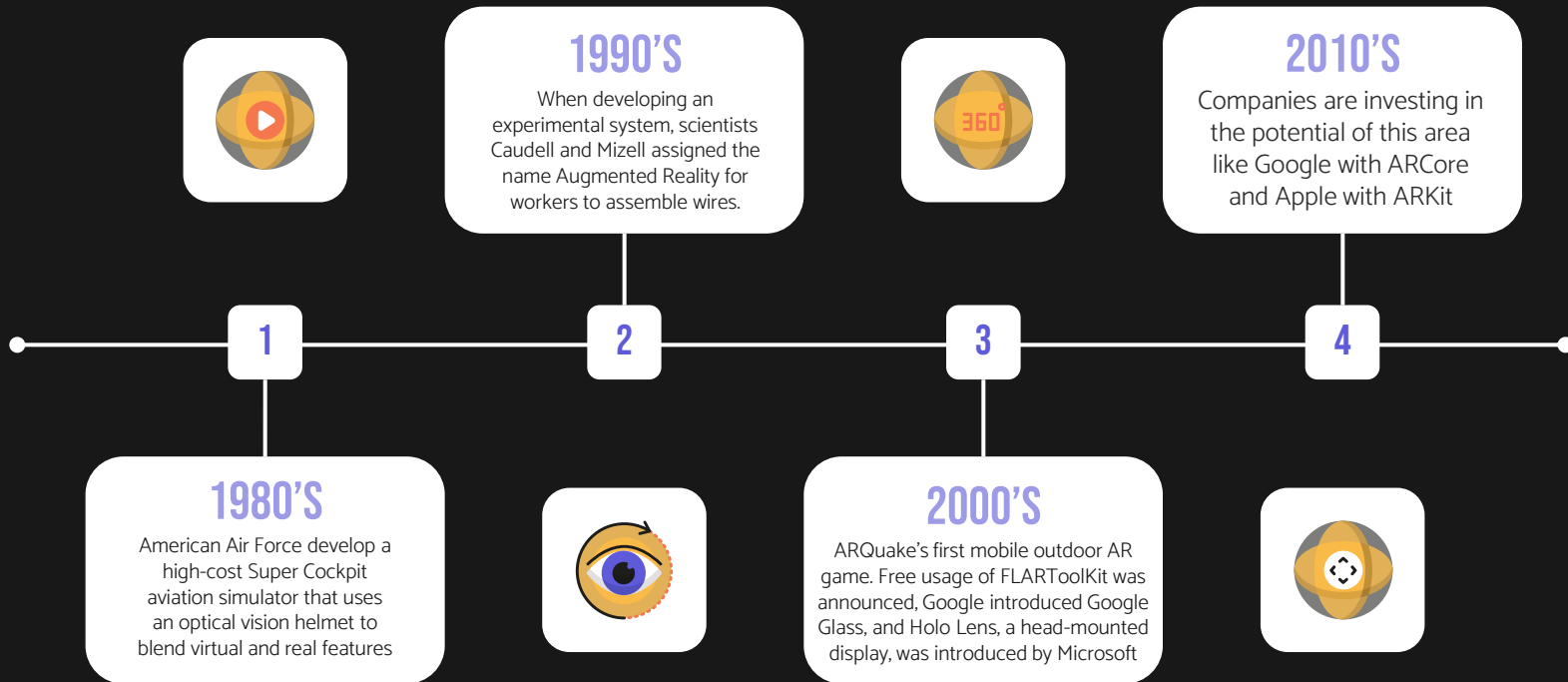
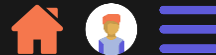
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# EVOLUTION OF AR





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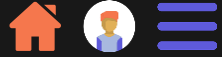
APPLICATIONS



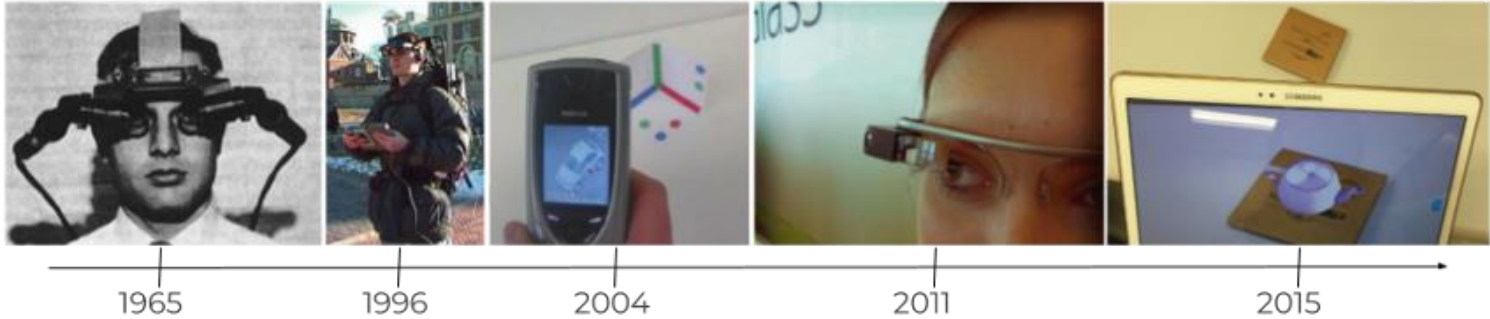
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# EVOLUTION OF AR





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03.

# GOALS & STRATEGY OF AR



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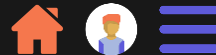
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EXAMPLES



# CORE CUSTOMER AUDIENCES



## GENDER



60%



85%

## AGE

25-35



36-45



46-65



## INDUSTRY





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# MARKET SHARE

## GAMING & MEDIA

AR gaming market has segmented into, smart glasses and head-mounted displays

## HEALTH

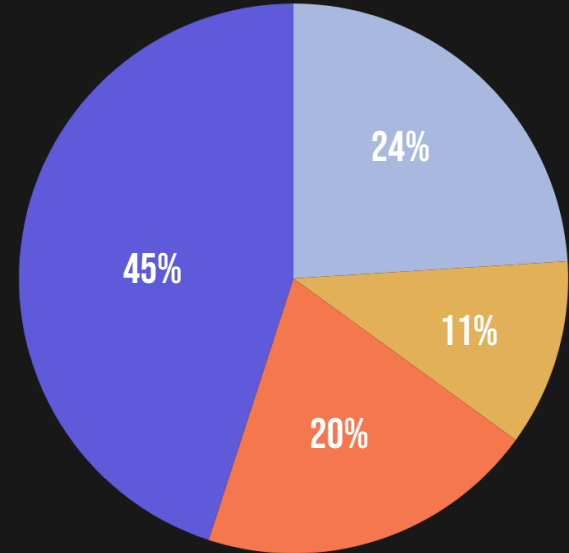
3D visualization is expected to be of great help to the healthcare sector.

## EDUCATION

Technological advancements have led to the rising adoption of smart education and technologically advanced classrooms in the educational and corporate setups

## E-COMMERCE

Virtual platforms are gaining popularity in the retail and e-commerce industry in line with the growing consumer preference for online shopping.







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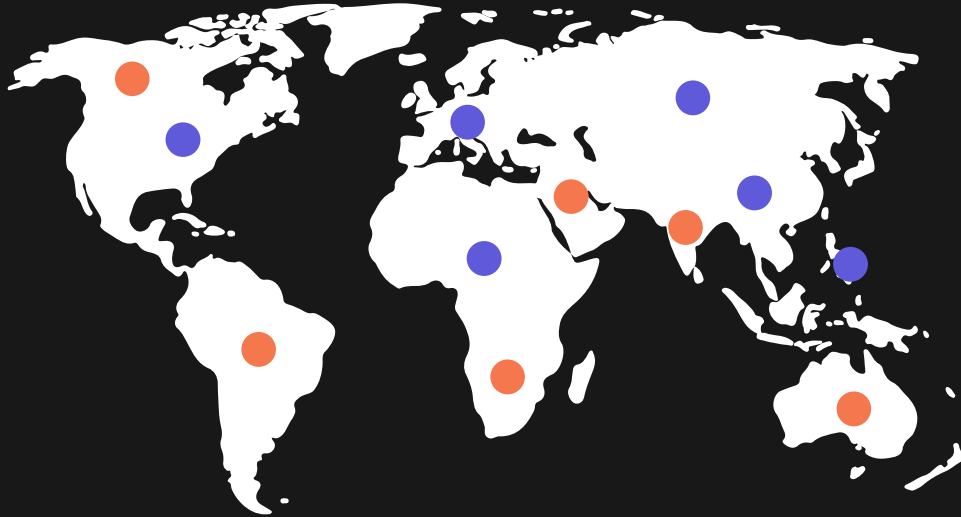
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EXAMPLES



# GLOBAL OUTREACH



## AR WORLDWIDE

In Geographical terms, China provides the biggest expenditure on AR/VR followed by the US. Western Europe and Japan will be the next two largest regions, however by 2023 Western Europe will move on from China to second position. West Europe and the United States are the areas with the fastest growth in AR/VR expenditure throughout the predicted period.



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APPLICATIONS OF AR





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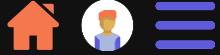
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EXAMPLES



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AUGMENTED  
REALITY  
IS THE NEW  
FUTURE!





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# APPLICATIONS OF AR



## GAMING

- Immersive gaming experience.
- Experience the cutting edge of gaming.
- Delivers stunning graphics and heart-pounding gameplay.





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# APPLICATIONS OF AR

## MEDICAL



- Puts medical information in front of surgeon.
- Reduces the risk of mistakes.
- Improves surgical accuracy.





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# APPLICATIONS OF AR

## MILITARY



- Provides battlefield advantage.
- Provides information at a glance.
- Reduces distraction.





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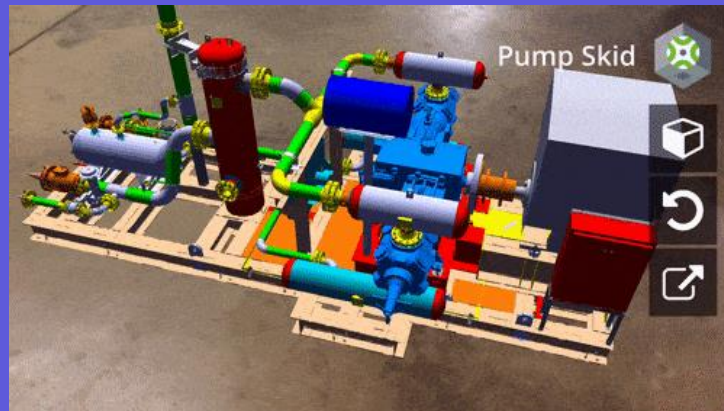


# APPLICATIONS OF AR

## INDUSTRIAL & MANUFACTURING



- Easy access to libraries of information.
- No need to break away to do research.
- Instructions available at a glance





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# 05.

## OUTCOME

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# PUBLIC RELATIONS OUTREACH

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Gaming

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Google  
Lens



Social  
Media  
Apps

## GOALS



60%



75%



85%

**GOOGLE LENS:** real-time answers  
to questions about the world  
around you

**LENS STUDIO:** Bring your idea to  
life with suite of Lens  
development.

+



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# \$10,700,000,000

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The size of the world-wide Augmented Reality market is forecasted to increase from \$10.7 billion, and is likely to reach \$72.7 billion by 2024.

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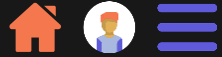
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EXAMPLES



# PROSPECTS OF AUGMENTED REALITY



01

**Gaming & Entertainment:** Persistent AR will turn your entire living space into an interactive gaming arena.



02

**Navigation:** Finding your way around is one of the clearest use cases for AR.



03

**Task Assistance:** Your AR app will guide you through the steps, lighting things up and drawing arrows.



04

**Education:** Interactive AR experiences will make it easier to learn complex educational subjects



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# 06.

## PRACTICAL EXAMPLES



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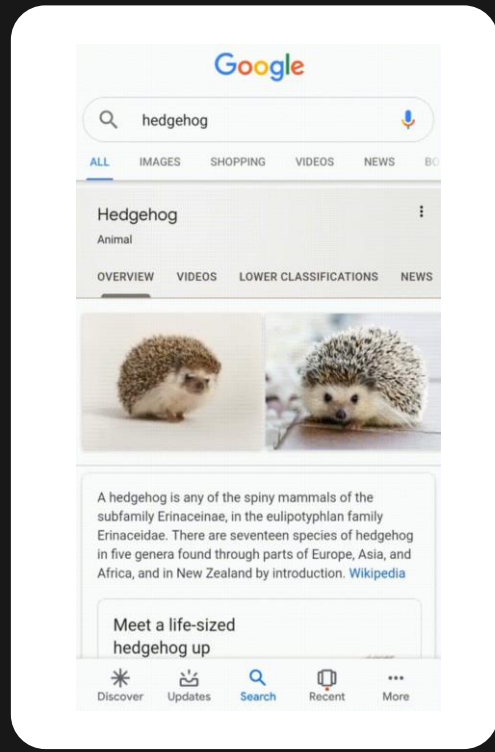
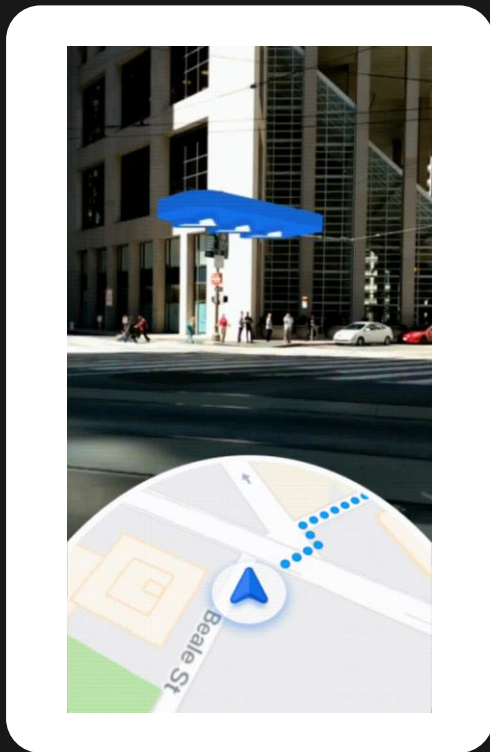
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# GOOGLE LENS





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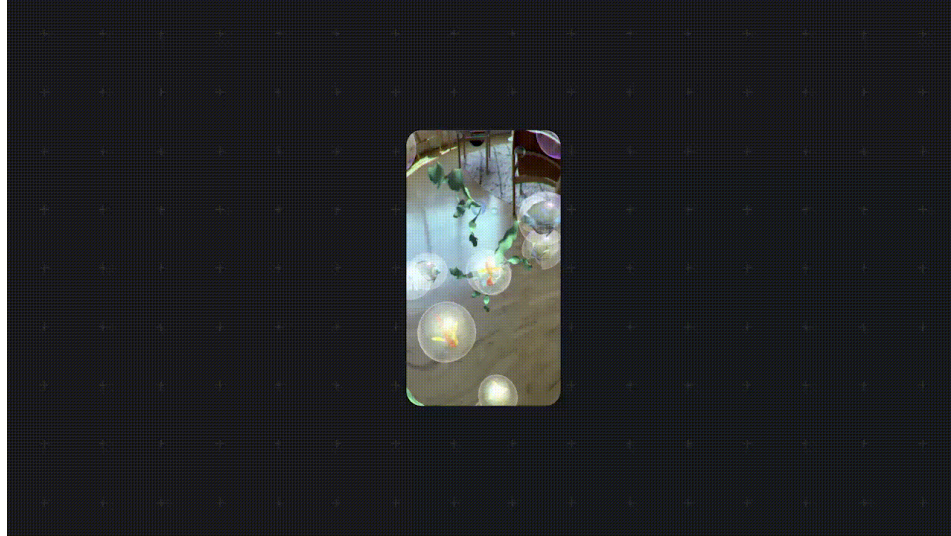
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**Snap AR** enables Creators around the world to revolutionize the way we create, explore, and play.



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A visual Augmented Reality prototype used to extract person from an image and display its segment in an AR view using **TensorFlowJS**.





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# LENS STUDIO

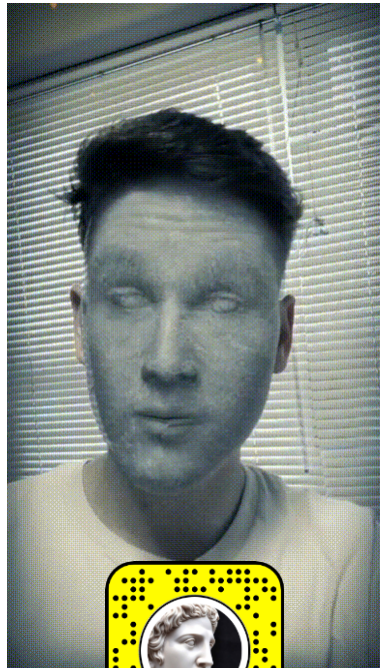
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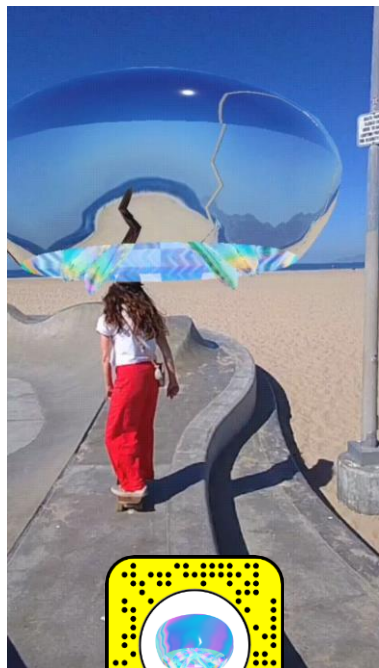


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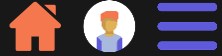


EXAMPLES



# CONCLUSION

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Augmented Reality is just starting to break out of its infancy, because of this the possible applications in the future are tremendous. As we've described already, AR is being used in some very interesting and innovative ways. Moving beyond what is technically possible we do see social acceptance issues and privacy concerns arising, and being addressed, as Augmented Reality applications become more robust. Social acceptance is linked to the necessity for technologies to be modest, discreet, discrete and trendy. Privacy concerns will arise in a variety of ways, but this will be true of any technology that has the ability to detect and recognize people.



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# THANKS!

Do you have any questions?

