EXPLORING THE INTERSECTION OF HUMAN-COMPUTER INTERACTION (HCI) WITH AUGMENTED REALITY (AR) & VIRTUAL REALITY (VR)

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OUTLINES

❏ UNDERSTANDING: HCI & IMMERSIVE TECHNOLOGIES

❏ EVOLUTION FORM PAST TO FUTURE OF:

   VR, AR, MR AND XR

❏ APPLICATIONS ACROSS INDUSTRIES

❏ POSITIVE AND NEGATIVE SIDES

❏ CONCLUSION

HUMAN – COMPUTER INTERACTION (HCI)

WHAT IS HUMAN INTERACTION

❑ **Human-Computer Interaction (HCI) is a multidisciplinary field concerned with the design, evaluation, and implementation of <u>interactive computing systems</u> for human use.**

❑ **It covers the study of how humans interact with computers and the design of interfaces that facilitate efficient, effective, and satisfying user experiences.**
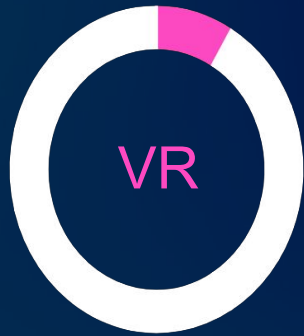
COMPUTER SCIENCE DEPARTMENT

IMMERSIVE TECHNOLOGIES

Immersive technologies are technologies that deeply engage users in digital experiences by surrounding them with <u>virtual environments</u> or <u>augmenting their real-world surroundings with digital elements.</u>

IMMERSIVE TECHNOLOGIES
DISTINGUISHING BETWEEN TERMS:

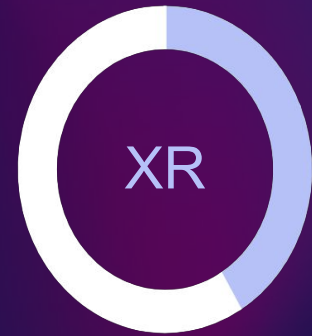**VR**

AR

MR

XR

VIRTUAL REALITY

AUGMENTED REALITY

MIXED REALITY

EXTENDED REALITY

VIRTUAL REALITY (VR)

❑ **Virtual Reality (VR) immerses users in a <u>computer-generated environment,</u> typically through serval types of VR headsets.**

❑ **VR experiences can range from immersive <u>gaming and entertainment</u> to <u>educational simulations,</u> <u>virtual meetings,</u> and <u>therapeutic interventions.</u>**
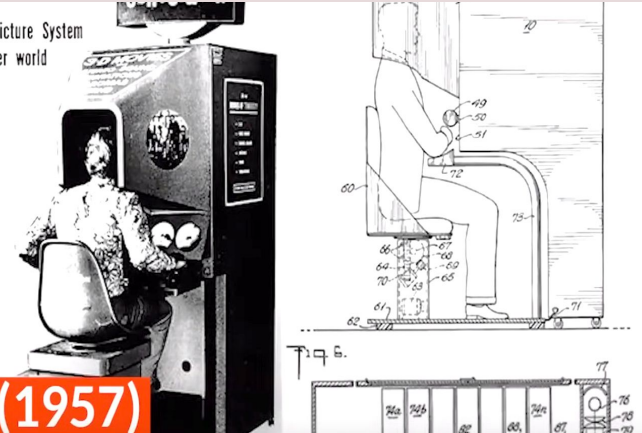
HISTORICAL JOURNEY OF VR:

Morton
Heilig

The Revolutionary Motion Picture System
that takes you into another world
with

- 3-D
- WIDE VISION
- MOTION
- COLOR
- STEREO-SOUND

SENSORAMA (1957)

HISTORICAL JOURNEY OF VR:

Jaron Lanier (1987)

BBC

LANIER'S LAB, 1989
Photo: Kevin Kelly

one of the first companies to design and sell virtual reality **goggles and gloves.**

EXAMPLES COMPANIES ARE INVESTING BILLONS OF DOLLARS IN THE VR SECTOR

APPLE

SNAPCHAT

GOOGLE

MICROSOFT

MAIN USES OF VR IN REAL LIFE

Education : ClassVR

VR headsets with user friendly interface Embedded with Educational Resources.

Healthcare: MedicalVR

Helps to learn anatomy and train on surgical procedures and medical inspections accurately.

Entertainment & Gaming

VR gaming allows the users to have the experience of being physically present in the virtual world.

AUGMENTED REALITY (AR)

❑ **Augmented Reality (AR) overlays digital content onto the user's view of the real world, typically through devices such as smartphones, tablets, or AR glasses.**

❑ **AR applications range from simple informational overlays (like displaying directions or points of interest) to complex interactive experiences (like training simulations).**

SWORD OF DEMOCLES (1968)

IVAN SUTHERLAND
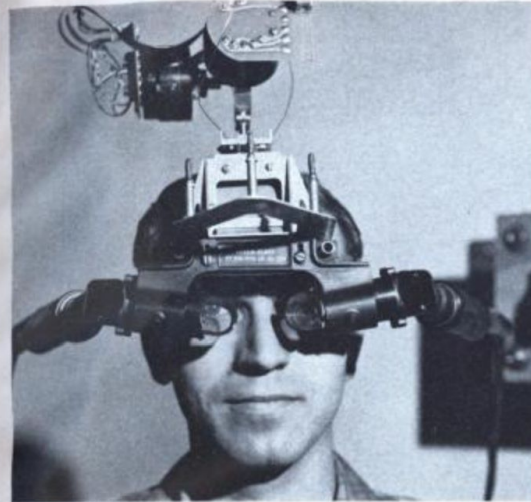
▲ 3-D trip inside a drawing, via computer graphics

Slip this display device on your head and you see a computer-generated 3-D image of a room before your eyes. Move your head and your perspective changes, just as though you were actually inside the room. Architects could use the device to draw buildings in three dimensions; realtors could use it to show buyers the interiors of homes without even leaving the office. Dr. Ivan Sutherland, University of Utah, invented the device, essentially a computer-graphics version of the old stereoscope.
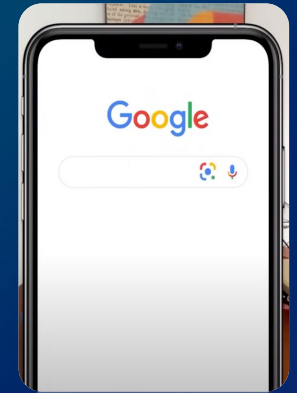
Augmented Reality.

MOST POPULAR AR APPLICATIONS
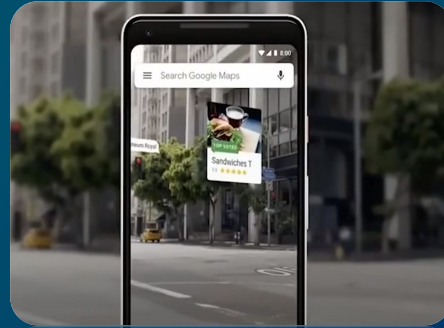
GOOGLE MAPS
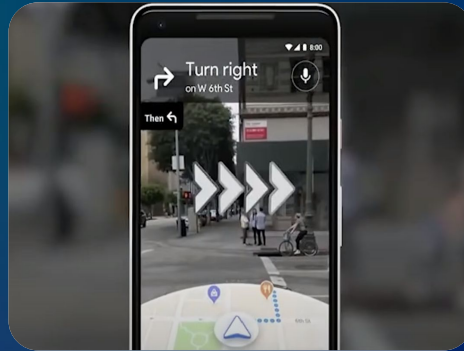
SNAPCHAT FILTERS
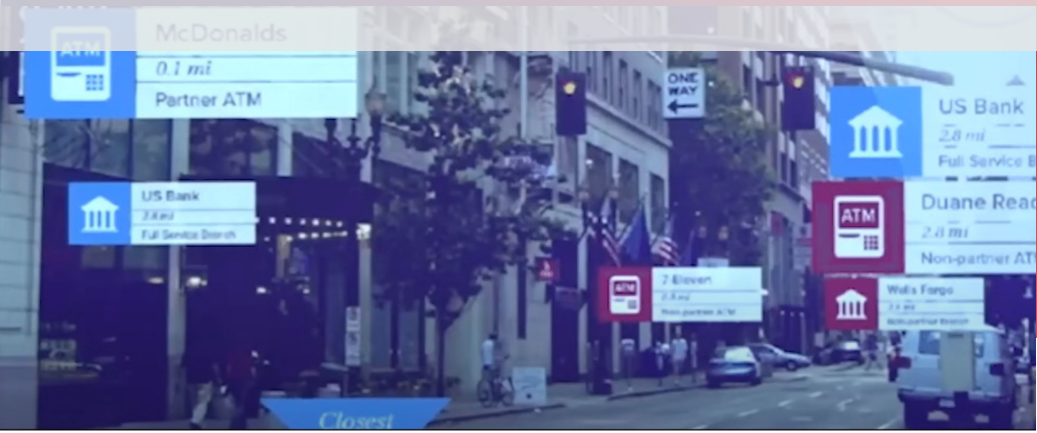
GOOGLE LENS

3D WORLD MAPS BY FACEBOOK

MIXED REALITY (MR)

❑ Mixed Reality (MR) is a technology that combines elements of both Augmented Reality (AR) and Virtual Reality (VR).

❑ It blends digital content with the real world, allowing users to interact with virtual objects while still being aware of their physical surroundings.

MODRED WORKPLACE

MIXED REALITY (MR)

❑ **MR systems understand the user's environment and can adapt to changes in <u>real-time</u>.**

❑ **MR has the potential to transform how we interact with <u>digital content</u> and our <u>surroundings</u> by creating smooth experiences that bridge the gap between the virtual and physical worlds.**

❑ **Example: The Microsoft Hololens that using <u>multiple sensors</u>, <u>advanced optics</u>, and <u>holographic processing</u> that melds seamlessly with its environment, These holograms can be used to display information, blend with the real world, or even simulate a virtual world.**

EXAMPLE OF MR : MICROSOFT HOLOLENS

EXTENDED REALITY (XR)

❑ **Extended Reality (XR) is a term that covers all immersive technologies like Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR).**

❑ **It includes experiences that blend the real world with digital content.**

❑ **XR lets users explore virtual environments, overlay digital information onto the real world, and interact with virtual objects in real-world settings.**

APPLE VISION PRO

❑ A spatial computer blends digital content with the real world, letting users interact with virtual elements as if they're real.

❑ It uses technologies like augmented reality (AR) or virtual reality (VR) to overlay digital information onto the user's surroundings or create immersive virtual environments.

❑ The headset is capable of running popular Apple apps, including Books, Camera, Contacts, FaceTime, Mail, Maps, Messages, Music, Notes, Photos, Safari, and more in mixed reality

APPLE VISION PRO

POSITIVES AND NEGATIVES OF USING IMMERSIVE TECHNOLOGIES

POSITIVES

✔ **Enhanced Learning environment**

✔ **Improved Training courses**

✔ **Innovative Entertainment**

✔ **Enhanced Visualization**

✔ **Increased Productivity**

NEGATIVES

✔ **Costly Equipment**

✔ **Health Concerns**

✔ **Privacy and Security Risk**

✔ **Potential for Addiction**

✔ **Social Isolation**

SUMMARY

conclusion, while AR, VR, MR, and XR technologies offer exciting opportunities for learning, entertainment, and productivity, they also come with challenges such as cost, health concerns, privacy risks, addiction potential, and social isolation.

However, considering their rapid advancements and increasing integration into various industries, it's clear that these immersive technologies will play a significant role in our future.

By addressing the challenges and responsibly embracing the potential of AR, VR, MR, and XR, we can ensure that they contribute positively to our lives while enhancing innovation and human experiences in the years to come.