City University of New York (CUNY)
CUNY Academic Works

Publications and Research | New York City College of Technology

2023

Augmented & Virtual Reality: Advancement of technology and its impacts on medicine, education, and other industries

Yassine Chahid
CUNY New York City College of Technology

How does access to this work benefit you? Let us know!

More information about this work at: https://academicworks.cuny.edu/ny_pubs/1059
Discover additional works at: https://academicworks.cuny.edu

This work is made publicly available by the City University of New York (CUNY).
Contact: AcademicWorks@cuny.edu

Augmented & Virtual Reality: Advancement of technology and its impacts on medicine, education, and other industries

Student: Yassine Chahid
Mentor: Patrick Slattery

Project Goal

AR and VR technology have been evolving rapidly ever since their invention. This project aims to assess the main impacts these respective technologies have had on current industries, alongside their future prospects in various industries. By examining the capabilities of AR and VR, applications can be developed to help workers in education, medicine, and other industries complete complex tasks more pragmatically and effectively. As it stands, AR and VR have been used as entertainment mediums, with AR also being used in many smartphone apps. But now the technology is being used to assist industry workers in their tasks whether it be through educating, training, or simulating. The project will assess the usage of AR and VR in these industries, especially within health care and education.

Distinction

VR, or Virtual Reality, involves the creation of fully a digitized environment. This digital environment can be interacted with through the use of wearable hardware such as a headpiece fitted with a screen or other body sensors. Movements usually mimic real life.

AR, or Augmented Reality, involves the creation of virtual objects in a real life space. This is achieved through using cameras to capture a real life environment, while overlaying any relevant information or objects digitally on some form of screen, such as a smartphone.

A headset that is capable of VR.

A smartphone that is capable of AR.

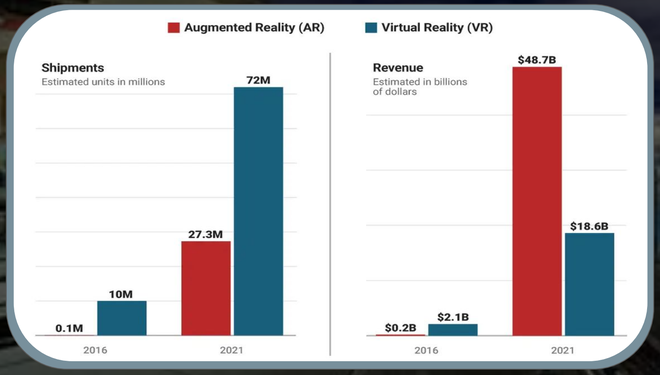
History

The term “virtual reality” was first coined by Jaron Lanier in 1987, the founder of VPL Research Inc. which would be the first company to sell VR goggles. The term “augmented reality” was coined in 1990 by Tom Caudell, a Boeing researcher. Soon after, VR would make its first major introduction through arcade gaming, with arcade machines such as the SEGA VR-1 motion simulator. As for AR, its first major adoption was on a 1998 Sportsvision broadcast of an NFL game, where a yellow line marker would overlay the game in real-time. Another notable release of XR tech was the debut of Google Street View in 2007, allowing its users to visit many attractions and landmarks throughout the real world.

Popular Use

VR and AR have commonly been used as forms to consume media and virtual content, especially in gaming. One of the most notable of brands which control this market is Oculus, a company bought out by Facebook which produces VR headsets, with its flagship series being the Oculus Quest line of headsets. XR technology is not limited to gaming, as in 2017, IKEA debuted its IKEA Place app for mobile devices, allowing customers to utilize augmented reality to see what furniture items would look like in the space of their own homes. Similarly, Amazon has incorporated augmented reality into its main app, allowing customers to display items they may want to purchase in the space of their homes. The two aforementioned uses highlight the potential of XR tech beyond entertainment.

Worldwide AR/VR Headset Shipments & Revenue



Future

AR and VR are capable of branching into many current industries. Some of these industries include medicine, education, architecture, and even journalism. The prospects of medicine and education are especially profound. Within medicine, VR/AR can provide access to health care services typically available in clinical settings at home. For those facing socio-economic hardship, the elderly, or disabled, this greatly expands the availability and quality of these services. Similarly, VR and AR can greatly enrich the quality of education in public schools and institutions. The immersion of AR/VR enables it to convey information in much more engaging and interactive ways. Despite being in its early stages, there are many promising use cases of the technology in its current state.

Health Care

The usage for VR and AR in treating patients can include...

- Mental health
- Neurological disorders
- Surgery planning
- Virtual care
- Rehabilitative therapies

AR and VR can provide many enhancements to current healthcare, making them a promising new advancement for this industry’s technology. Diagnoses could be accelerated while also letting care be more self-directed. Additionally, it expands access to these services for many, while also reducing the invasiveness of said services. Health care professionals also benefit, as they are able to better prepare for specific treatments and help fulfill specific medical needs.

Education

For K-12 education, AR and VR enhances the resources educators have to make classroom learning more interactive. They can provide libraries containing engaging material, experiences tailor made for specific topics, and even resources to help students with learning disabilities.

For those pursuing higher education, AR and VR can help students better understand abstract concepts while also enabling them to get more hands-on experience under low-risk environments. STEM courses are especially enhanced alongside medical simulations or other technical settings.

Sources

https://www.fda.gov/medical-devices/digital-health-center-excellence/augmented-reality-and-virtual-reality-medical-devices#:~:text=Augmented%20Reality%20and%20Virtual%20Reality%20(AR%2FVR)%20have%20the,and%20where%20care%20is%20delivered

https://www.forbes.com/sites/bernardmarr/2021/05/17/the-fascinating-history-and-evolution-of-extended-reality-xr--covering-ar-vr-and-mr/?sh=3a7e25794bfd

https://itif.org/publications/2021/08/30/promise-immersive-learning-augmented-and-virtual-reality-potential/

https://www.businessinsider.com/augmented-reality-virtual-reality-sales-idc-chart-2017-3

https://www.wired.com/2014/05/oculus-rift-4/