

EXTENDED REALITY (XR)

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Annotation. This paper discusses the use of extended reality technology in various areas of our lives. Modern and actively developing types of extended reality (XR): virtual (VR), mixed reality (MR) and augmented reality (AR) are considered. The provided information will clear up any confusion regarding the nature and possibilities of extended reality technology and open up new avenues for investigation and XR application in both personal and professional contexts.

Keywords: reality, virtual entertainment, applications, immersive technologies.

Introduction. A technology known as Extended Reality (XR) makes it possible to include a human into a virtual setting. It can only be used with a computer, tablet, or smartphone. The data from a video camera that transmits an image to the screen serves as the foundation for the environment.

Main part. Augmented reality (AR), virtual reality (VR), and mixed reality (MR) are all combined to create extended reality (XR). XR is not directly related to any specific technology - it is a general term that covers all of the above technologies. XR enhances immersion, whether it is in augmented realities or virtual realities - it applies to every possible visual augmentation of reality.

Artificial intelligence (AI) computer vision, which enables machines to «see» and comprehend the visual environment, is at the heart of XR technology. Devices are able to sense and engage with their environment thanks to the second generation of XR computer vision algorithms. This knowledge serves as the foundation for both AR and VR projects that include constructing virtual items in the real world or visualising immersive experiences.

Considering extended reality technology (XR), the potential of artificial intelligence (AI) cannot be understated. Artificial intelligence is essential to producing intelligent and responsive XR experiences, from computer vision algorithms to lifelike interactions with digital information. Machine learning approaches are specifically intended to enhance objects, enhance external interfaces, and customize content according to user activity.

With the use of virtual reality (VR) technology, people can become completely immersed in a computer-generated environment and become detached from reality. Users usually don a headset with a display that fills their field of vision in order to enjoy virtual reality. In order to provide a more participatory and realistic experience, advanced VR systems also include tracking sensors and hand controllers. Virtual reality (VR) has uses in many different fields, including training simulations, gaming, and treatment. The Oculus Rift and HTC Vive are a couple of the well-known VR gadgets.

AR and VR are combined to create mixed reality (MR), also known as hybrid reality or mediated reality. Users can interact with digital content and the real world at the same time since it blends elements of both virtual and real worlds. Magic Leap One and Microsoft HoloLens are two examples of devices that allow users to experience mixed reality. Immersion experiences are closely associated with MR technology in fields such as gaming, education, and healthcare. It enables people to work together in a hybrid digital and physical environment and manipulate virtual things. Applications for mixed reality include entertainment, architecture, and remote help.

Augmented Reality (AR) is a reality-based interactive display environment that enhances real-life human experiences using a computer-generated text, sounds, and results. It creates a cohesive and appealing worldview by fusing real and computer-generated settings and imagery. The primary components of augmented reality are embedded electrical chips, screens, and sensors. It is extensively utilised in the retail, healthcare, gaming, and entertainment sectors in addition to the organizational and automotive sectors.

XR utilizes AR advances - they permit the presentation of items that cross-over the entertainer. For instance, a vehicle shows up in the studio with which an individual can communicate: he goes behind it, strolls around it - and he gets the sensation of its presence in the casing. Sensors on the cameras permit a user to continuously shoot objects with added reality from the right point so everything appears to be all around as credible as could be expected. Any place the camera returns, sensors change the realistic components in the casing to the ideal point [1].

The advantages of extended reality are numerous. The pioneering technology of immersive extended reality is having a profound impact on the enterprise, giving companies the opportunity to improve production efficiency, create and establish new customer engagement channels. Extended reality has developed throughout time and now has uses outside of entertainment and games. XR is being used by sectors including healthcare, architecture, and education to transform their respective disciplines. With XR, you can model and create risky situations without endangering human life. Employees can also access the training platform from anywhere in the world with XR technologies, which reduces the cost of live training.

The gaming business has been greatly impacted by this innovative technology, which offers gamers an immersive and participatory experience. XR allows players to immerse themselves in exciting virtual worlds where the line between the virtual and the real is blurred. The gameplay becomes more realistic and attractive due to the ability to interact with the outside world. While VR headset games like Beat Saber and Oculus Rift exclusives immerse players in the virtual world, augmented reality games like Pokémon Go merge real-world environments with virtual reality. Gamers' gaming experience can be improved by using head-mounted displays, such as the Oculus Quest 2. These devices let users experience 3D environments.

Extended reality technology has begun to be used in the healthcare sector, providing new avenues for patient treatment and training. For more effective training, medical personnel utilize virtual reality to mimic surgeries and other procedures. Additionally, by exposing patients to regulated immersive situations, therapies utilizing VR or AR can benefit those with psychological problems like PTSD.

Extended reality technologies are being used more and more in the sports industry for performance improvement and training. Athletes can train in a simulated setting with real-time data analysis and feedback thanks to virtual production technology. Concurrently, supporters have a new avenue to interact with their preferred clubs thanks to immersive experiences like virtual stadiums [2].

However, as with any new technology, extended reality has its drawbacks, the most important of which are technical problems, and effect on the health of the user. XR requires special equipment such as observation glasses or augmented reality. This equipment can be expensive, require a certain level of computing power and support, as well as has limitations on the time of autonomous operation and user comfort [3]. In addition, prolonged use of XR devices can cause eye strain, headaches and other health problems. Because XR is addictive, users may endure physical discomfort as well as sensory problems including motion sickness, eye strain, or even stress. It is crucial to guarantee user comfort and safety during extended XR sessions in order to facilitate wider deployment. Also, the use of XR in certain situations, such as driving, may pose a security risk.

Conclusion. All in all, such rapid development represents a unique improvement in many aspects of life, comfort and making daily work safer especially for those who work in hazardous environments, but at the same time there is a risk of cash shortages and some health problems. People in the future will be more careful to approach all the nuances of extended reality (XR), because this technology will be even more advanced and will broaden new horizons.

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