Immersive technologies - Tech trends position statement

Definition

Immersive technologies enable you to experience and interact in three-dimensions (3D) with digital content in a way that looks, sounds and feels almost real. These technologies include augmented reality (AR), virtual reality (VR), mixed reality (MR) and haptics. [i]

Background

Some immersive technologies work by blending the virtual and actual worlds. Others create a highly interactive sensory experience, engaging you through touch, sound and visual content.

Immersive technologies can involve one or more of the following types:

- **Augmented reality** (AR) overlays your view of the actual world with digitally-generated real-time sound and vision. You usually view the combined actual and digital content through a handheld device or smart glasses. Pokémon Go, Snapchat and Google Translate are examples of apps that use augmented reality.
- **Virtual reality** (VR) uses computer hardware and software to create an artificial environment that looks and sounds as if you are really there. Often, you can interact with this environment and navigate through it by using a headset and handheld controller that are loaded with sensors which track your head and hand movements. Oculus Quest, Oculus Rift S, HTC Vive, PlayStation VR and Valve Index are examples of headsets used for virtual reality games and experiences.
- **Mixed reality** (MR) combines elements of both AR and VR. In mixed reality, digital content blends into the physical environment so you see and hear the virtual elements as an extension of reality. The virtual objects or characters behave as if they are real, interacting with light, sound and space. Microsoft's Hololens is a well-known example of a commercially available mixed reality device.
- **Haptic technologies** stimulate your sense of touch. When used in combination with AR or VR, haptics enhance your user experience by adding tactile feedback, so you 'feel' what is happening, as well as 'seeing' and 'hearing' it. Simple haptics can be integrated into phones, controllers and wearable devices. Haptic suits with multiple sensors give you a more immersive experience. Holosuit, Teslasuit, Exoskin Haptic jacket, Plexus VR Glove, Dexmo Gloves, EXOS Wrist DK2 & Exos Gripper, and Manus VR Prime Haptic gloves are examples of haptics available commercially.

Use of immersive technologies is predicted to increase throughout the next decade, with industry investing heavily in their development. The advances are happening so rapidly that researchers suggest virtual experiences will soon be almost indistinguishable from actual experiences.

Positive use cases

Immersive technologies provide a range of opportunities – in entertainment, education, defence, health sciences and other fields. Being able to practise a skill virtually or to understand an experience from an unfamiliar point of view are valuable applications. For example, they can give medical students affordable and convenient interaction with realistic representations of anatomy without using real patients.

Immersive experiences can improve the quality of life and independence of people who are unable to access actual experiences for a variety of reasons, including disability, age, caring responsibilities, transport access or remoteness.

Immersive technologies can also help people build empathy. Experiencing a virtual world in the same way as someone else experiences the actual world is more personal and intense than simply having it explained. This has been shown to improve understanding of people from different ethnicities, genders and abilities – a useful tool for workplace diversity training.

However, immersive technologies also pose safety, privacy and security risks.

Risks

As with all types of digital technology, immersive technologies can be used for harms such as cyberbullying, grooming children for online sexual abuse, and image-based abuse (sharing intimate content of someone without their consent, including sextortion). By providing hyperrealistic experiences – where virtual sensations feel real – immersive technologies could increase the impact of negative interactions, and lead to a rise in online assaults and abuse.

For example, groping or other sexual assaults might be experienced virtually through a haptic suit; augmented realities could be used to fake a sexually explicit three-dimensional image or video of a real person and interact with it, without their consent; and a virtual experience may feel private because you are physically isolated, but if you use it to create an intimate image or video the file could be livestreamed, stored, stolen or shared without consent.

The use of teledildonics, haptic devices designed to stimulate sexual excitement remotely, can improve intimacy for people if physical distance or disability are an issue. But there is a risk of non-consensual sexual activity. This could occur, for example, if the victim believes it's their intimate partner controlling the haptic device, but instead it's being controlled or hacked by someone else.

eSafety has significant concerns about the use of immersive technologies as a tool for online child sexual abuse. Online interaction, and gaming in particular, is very popular with children and young people, so predators use it as a way to meet and groom them for sexual abuse. Hiding behind an avatar or a fictional character allows a predator to pretend to be a friend, often the same age as the child they are targeting, then persuade them into sexualised conversations and actions online or in person. Children and young people who are still developing the critical reasoning skills to recognise virtual risks may be more easily influenced and manipulated by avatars in an exciting, hyper-realistic environment.

Predators already commonly livestream, record and share sexual abuse online. The addition of haptics, particularly teledildonics, would allow them also to 'feel' and be felt by victims even if they don't have physical contact with them, intensifying the abuse.

Another concern is the potential for 'addiction' to immersive environments. Being able to access unlimited extreme or intense experiences, or an environment that is more comfortable or attractive than reality, may make it difficult to leave the virtual world and participate in actual experiences and relationships. Being able to customise immersive experiences to allow abuse and antisocial attitudes, including sexism, racism and homophobia, could also desensitise the user, making them more likely to act that way in real life.

Alongside these safety risks, there are data privacy concerns. Immersive technology devices can record vast amounts of data, including biometric information such as fingerprints and location. Such large stores of data could increase identity theft, fraud, scams and **doxing**.

It's also important to be aware that while immersive technologies have shown benefits for some people with disability, not all devices are designed inclusively. A failure to design immersive technologies with safety and inclusive access in mind may lead to greater inequalities and social division.

Recent coverage

- During Facebook Connect, Facebook's key augmented and virtual reality event held in September 2020, Mark Zuckerberg announced that Facebook will release its first pair of AR glasses in 2021. Facebook also showed the public 'Horizon', a metaverse that provides a shared space for users to socialise in virtual reality.[ii]
- In 2020, pornography production company Sex Like Real launched a new interactive experience that uses multi-camera videos to create a sexualised virtual environment. Users then interact with the content through a synchronised teledildonic device.[iii]
- In 2018 a teledildonics company was used for collecting sensitive user data, including when the devices were used, vibration settings and more, linking it all to the users' email addresses.
- In 2016, gamer Jordan Belamire blogged about her experience of being virtually groped playing the fantasy game QuiVR. She wrote that 'the virtual groping feels just as real. Of course, you're not physically being touched … but it's still scary …'[v] This illustrates the very real impact that sexual misconduct can have even when it happens virtually.

eSafety approach

eSafety recognises that it's unfair to hold users, especially children, solely responsible for their safety within immersive environments. The developers, sellers and online hosts must also guard people from any risks in their products and services. eSafety is championing a proactive harm-prevention approach in Australia as part of our Safety by Design initiative. We are working with industry and users to identify risks, embed protections and provide complaints pathways to ensure immersive technologies and their benefits can be fully enjoyed by all people.

eSafety is also raising public awareness about how immersive technologies could be used for online abuse, so people can recognise and avoid the risks. For example, our Gift Guide contains information about staying safer in virtual reality games.

At this stage, eSafety has not received any reports that augmented, virtual or mixed reality or haptics have led to any harms that could be dealt with through our regulatory powers. However, we expect we may soon receive reports of immersive technologies being involved in cyberbullying, image-based abuse and the production and spread of child sexual abuse material.

In these cases, eSafety would support victims of serious abuse by working with social media services and other online platforms, through existing relationships and escalation pathways. We would also engage with police and law enforcement where there are immediate risks of harm, and refer people to support services.

Advice for dealing with immersive realities

Most immersive technology companies recommend that children under 13 only play virtual reality games that are specifically made for children, and only for short periods of time, taking regular breaks.

When parents and carers are deciding if their child should play an immersive technology game, they should think about whether it's something they would want their child to experience in real life. It's also important to supervise children when they are online and let them know they can come to you for help if they experience anything that makes them feel uncomfortable or unsafe.

Parents, carers and educators need to teach children online respect, responsibility, critical reasoning skills and resilience, so they avoid common safety issues and feel comfortable reporting bad behaviour and abuse. They should make sure children understand that virtual characters, or avatars, are controlled by real people whose feelings can be hurt. They should also make it clear that the people controlling the avatars may not be who they say they are – and no matter how friendly they seem, they could harm children. This will help safeguard children against online sexual predators.

No matter what your age, if you are using an immersive technology check what information you are sharing and who you are sharing it with. An immersive technology device or platform is likely to record vast amounts of personal and other data which can put you at risk, so check eSafety's tips on protecting your personal information.

If someone in an immersive environment threatens, abuses or harms you or someone in your care there are several steps you can take:

- **Collect and preserve evidence**, using screenshots or similar methods, unless it shows nude or sexual content of someone under 18 years old.
- **Report to the platform** where the threats or abuse are occurring — The eSafety Guide provides the relevant links for many popular platforms and services.
- **Report to eSafety** – we can help remove serious cyberbullying, image-based abuse and illegal or harmful content online.
- **Block unwanted contact** — The eSafety Guide provides many of these links.
- **Seek further support** from an expert counselling service.

If you suspect online child sexual abuse or grooming by a sexual predator report it straightaway, to the Australian Centre to Counter Child Exploitation via the 'Report Abuse' button on accce.gov.au/report. Or you can report it anonymously to Crime Stoppers on 1800 333 000 or at crimestoppers.com.au

And remember, if you or someone you know is at serious risk of immediate harm call Triple Zero (000).

Published: 10 December 2020

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[vii] Cyber-XR Coalition, Immersive Technology Standards for accessibility, inclusion, ethics, and safety www.cyberxr.org Special Edition Cyber XR-2020-1.0. Special Edition Cyber XR-2020-1.0/5. www.xrsi.org/research-standards

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