

AUDIO DESCRIPTIONS & ACCESSIBILITY

WHAT IS THE XR ASSOCIATION?

The [XR Association](#) promotes the dynamic growth of the XR industry. We convene and educate policymakers, thought leaders, researchers, developers, civil society, and the public on XR's infinite potential and serve as the premiere resource for anyone interested in learning about the applications of immersive technologies. Our member companies are united in our mission to champion the responsible development and thoughtful advancement of XR solutions that foster positive societal outcomes. Let us help you explore the endless potential of XR.

WHAT IS XR TECHNOLOGY?

XR is an umbrella term encompassing virtual, augmented, and mixed reality technology as well as other forms of alternate, expanded, or immersive technology applications.



Virtual Reality (VR)

VR replaces or occludes a user's reality with a new virtual environment like a factory floor or replication of the solar system.



Augmented Reality (AR)

AR layers digital content onto a user's view of the real world, thus providing a composite view.



Mixed Reality (MR)

MR allows users to experience simulated content within their physical worlds and to manipulate and interact with virtual elements in real time.

XR is changing the way we learn, do business, and provide essential human services. By delivering efficiencies in manufacturing, enhancing workplace safety, accelerating learning and job training, providing risk-free first responder training, improving healthcare and medical services, and providing rich experiences to individuals living with disabilities, XR is poised to become a part of daily life for users across the globe. XR is the technology of the future—today.

INTRODUCTION TO IMMERSIVE AUDIO

Developers across the XR industry are working to incorporate cutting immersive audio into their experiences. This technology empowers individuals in the blind and low vision communities to navigate virtual worlds and rely less on visual information within immersive landscapes.

AUDIO CUES CAN STRENGTHEN ACCESSIBILITY IN XR EXPERIENCES BY PROVIDING:



Navigation Assistance

Audio Cues can guide users to specific objects or locations within virtual worlds.



Spatial Awareness

Audio cues can indicate the presence of objects, events, or other people in the space, helping users understand the context of elements in 3D space.



Alternative Output

Audio cues and haptic technology can provide alternative sensory experiences, improving accessibility of XR content for people with visual impairments and enhancing the overall accessibility of XR experiences.



Improved Safety

Audio cues can warn people of potential hazards, making XR experiences safer for people with mobility or balance challenges.

AUDIO CUES IN INDUSTRY

Integrating audio cues into XR games and experiences can offer users a comprehensive understanding of their scenarios. In the apocalypse game [Swamp](#), developed by studio Black Screen Gaming, the user must navigate the world based solely on audio feedback. Swamp includes multi-level and PVP style interactions, where the user must track other players through increasingly challenging rounds. The game was developed through use of audio descriptions of locations and items and uses advanced [earcons](#) to signal to the player the direction of their quest. Other XR experiences use binaural audio to recreate three-dimensional audio which gives users a sense of depth and spatial positioning. Binaural audio enhances the realism and immersion of audio content which can assist those with visual disabilities navigate virtual worlds.

Companies including [Equal Entry](#) are challenging where and how much object description is needed to disabled give users the ability to navigate virtual worlds, while not overloading users with non-necessary information. XRA partnered with XR Access to host the [XR Community Discussion – Audio Cues](#) forum to investigate how audio cues can be leveraged to make XR more immersive and inclusive, and explored what lessons from 2D audio cues can be applied to 3D. During the public event, the group discussed what technical aspects can be applied to make audio more natural and effective, including use of earcons, frequency, rhythm, and tone in 3D environments.

[XR Access](#) aims to modernize, innovate, and expand XR technologies by promoting inclusive design. They lead a community that engages and influences the field of XR in order to share knowledge for a more inclusive world.

[Microsoft's Seeing AI Program](#) helps blind people navigate the world around them by using LIDAR scans to tell how far away things are, build a 3D model of the world, and present it through spatial audio. This is similar to [Microsoft Soundscape](#), which uses GPS metadata to provide users with auditory information about nearby landmarks, such as describing an upcoming intersection, and delivers this information through voice-based navigation. Google's [Blind Eye](#) can guide blind or low vision people on completing unassisted runs outdoors. This is achieved by tracking visual cues, for example the yellow line in the middle of the road, and providing real time feedback to the runner, alerting them if they are close to the line or veering off.

Both [Meta's Horizon Workrooms](#) and [Microsoft Teams](#) leverage spatial audio cues to enrich virtual meetings by adding a dynamic layer of engagement. Meeting participants can hear where people are spatially in a meeting (i.e., to their left or right) and feel more present during group discussions.

For more information about accessibility in XR, please visit the [XR Accessibility GitHub](#) site. You can also download the XRA Developers Guides: An Industry-Wide Collaboration For Better XR by visiting [xra.org](#).