Methodology and terminology in virtual reality

180-degree video

180-degree video is a VR format that limits the user's field of vision to just 180 degrees in front of them, rather than what is also behind them. Also called VR180, 180-degree video tends to be of higher visual quality than 360-degree video and allows for increased control over what users see in their field of view, making it somewhat closer to traditional cinematography.

360-degree video

360-degree video, or VR360, is a VR format that includes a full 360-degree, spherical view of a user's surroundings, including what is before and behind them. As a result, an individual watching a 360-degree video will be able to look around their surroundings in whatever direction they please, much as they do in the real world.

3D design

3D design refers to the process of conceptualizing, designing, and ultimately modeling three-dimensional digital assets, such as shapes, objects, and figures. In VR, 3D design can be used for a wide range of purposes, including to create 3D models of real-world objects or building the immersive world of a video game.

3D printing

3D printing is the process of turning a digital 3D model into a real-world object through the use of a 3D printer, which prints physical objects by adding thin layers of material upon one another until the object is fully formed. 3D printing can be used to create a wide range of objects, including prototypes, game pieces, and even organs.

Ambisonics

Ambisonics is a sound-mixing method used to create three-dimensional audio. In VR, ambisonics is used to create the kind of three-dimensional soundscapes that make a game, video, or program more immersive.

Audio engineering

An audio engineer is a sound professional who records, mixes, and masters sound and music. In VR, audio engineers must rely on their technical expertise to record and mix sound, while also using their

creativity to interpret and express its desired qualities. Audio engineers are integral to creating an immersive VR experience.

Augmented reality (AR)

Augmented reality (AR) is the overlaying of digital information or assets onto a physical environment in real time. Typically, AR uses devices like smartphones or smart glasses to augment a user's surrounding environment with digital information or assets. It can be used for educational, entertainment, or even workplace purposes.

Cave automatic virtual environment (CAVE)

A Cave Automatic Virtual Environment (CAVE) is a VR environment created using multiple projectors that cast videos onto four or six walls in order to create an immersive, virtual space. Typically, users wear stereoscopic glasses and use input devices like wands or joysticks to interact with the environment. CAVE can be used for a wide variety of purposes, including art, gaming, design, and engineering.

Character design

Character design is the process of conceptualizing and creating characters for products like toys and media like animated films, comics, and video games. In VR, character designers are responsible for creating the characters found within the program, whether it be interactive non-playable characters in a videogame or animated characters in a VR film.

Degrees of freedom

In VR, degrees of freedom (DoF) refers to the number of movements that a VR headset is capable of reading from users. There are two kinds of DoF: 3DoF and 6DoF. While 3DoF reads head movement up-and-down, left-to-right, and side-to-side, 6DoF is also capable of reading body movements forward-to-backward, up-and-down, and side-to-side.

Digital designer

Digital designers are professionals who create media for digital screens or interfaces. In VR, digital designers may work in a wide range of fields, including user interface (UI), user experience (UX), and animation design.

Dollhouse view

A dollhouse view is a top-down view of a virtual three-dimensional space, which resembles a dollhouse (hence its name). Dollhouse views are common in real estate and are often paired with a first-person perspective that allows potential home buyers to explore a property just as they might in person, while also allowing them to visualize the entire property as a 3D model.

Eye tracking

In VR, eye tracking is used to estimate the angle of a user's eyes as they look around a virtual environment. This helps VR programs both create a more realistic depth of field and decrease the amount of processing power required to render an environment as the program can know only to render those areas where the user is looking.

Field of view (FOV)

Field of view (FOV) refers to the amount of space that a user can see in front of them within a VR environment. The greater a VR headset's FOV, the more immersed its wearer will become within the program.

Frame rate

Frame rate refers to the number of consecutive frames per second (fps) used to display a moving image, such as for a film, video game, or animation. The higher the frame rate, the smoother the image will appear to those viewing it. As a result, the optimal frame rate for VR is often cited to be 90fps due to the constant head motion that users inevitably perform during a program.

Game developer

A game developer is an individual or organization that conceptualizes, designs and creates video games. Depending on the size of their team, game developers may do many different tasks, such as coding and prototyping, or they may only do very specialized tasks like only coding.

Game producer

A game producer is an executive who is responsible for managing the employees and teams who create a video game. Typically, video game producers focus more on business decisions than creative ones but their input can still have a significant impact on the final product as they must make some of the most critical staffing, budget, and development decisions. In effect, video game producers are responsible for coordinating all the aspects of a video game's development so that it can be completed on time and within budget.

Head-mounted display (HMD)

A head-mounted display (HMD) is a device worn on the head that includes one or two displays placed before the wearer's eyes so that they can experience virtual reality (VR), augmented reality (AR), or mixed reality (MR). Some well-known examples of HMDs include Google Glass, Microsoft Hololens, and Meta Quest 2.

Head tracking

In VR, head tracking refers to an application's ability to recognize the movement of a user's head. As a result, head tracking is what allows users to view their surroundings in a virtual reality program much as they would in the real world.

Haptics

Haptics is the use of technological devices to simulate physical sensations within a VR program. In effect, haptic devices, such as gloves and vests, allow users to feel as if they are being physically touched by virtual objects when immersed in a VR environment.

Immersion

In VR, immersion refers to the sensation of being fully present within a virtual program. Heightened immersion allows users to experience the virtual world as if they are a part of it rather than just observing it from the outside.

Java

Java is a programming language that is widely used to code applications, such as mobile, web, and cloud apps. Due to its reliability and adaptability, java is a popular programming language to create VR, AR, and MR experiences.

Latency

Latency is the amount of time that it takes for a user's input to create a reaction within a VR program. Common VR inputs include head motion, body motion, joystick movement, and button presses. The lower the latency between a physical input and its virtual reaction, the more immersive the VR experience.

Locomotion

In VR, locomotion refers to the method by which a user moves through a virtual environment. There are several different ways to create locomotion within a VR program, including by using a joystick to move directionally, teleporting virtually using wand gestures and button inputs, and even walking on an omnidirectional treadmill.

Metaverse

The metaverse is a shared virtual-reality space in which multiple users can both interact with one another and their digital surroundings. Common examples of the metaverse include Roblox, Fortnite, and Meta Horizon.

Metaverse gaming

Metaverse gaming refers to the use of the metaverse to play video games. As an immersive virtual space, the metaverse is a natural fit for video games, particularly social games like Fortnite, Roblox, or Minecraft.

Mixed reality (MR)

Mixed reality (MR) is an environment in which the physical and digital worlds are blended with one another. Unlike augmented reality (AR), which simply uses devices to overlay digital assets onto the real world, MR allows for real and digital objects to interact with each other. MR environments are accessed through the use of MR headsets and glasses.

Non-fungible token (NFT)

A non-fungible token (NFT) is a digital asset stored on a blockchain, which creates an immutable record that allows the asset to be bought and sold. As a result, NFTs are often used to create digital artworks, which can be showcased in VR environments such as virtual galleries and collections.

Point-of-view (POV)

In VR, point-of-view (POV) refers to the user's literal perspective, which is most often the first-person perspective (1PP). Third-person perspectives (3PP) are also possible, despite being much less common.

Positional audio

In VR, positional audio (or spatial audio) is the "placing" sounds within a virtual three-dimensional space to create a sense of acoustic depth. Positional audio allows sound designers and engineers to enhance the immersive experience of a VR environment by placing sounds near or far away from users so it simulates the spatial depth of real-world environments.

Virtual reality (VR)

Virtual reality (VR) is a computer-generated environment accessed through a head-mounted display (HMD), such as a helmet or glasses, which allows users to become immersed within a digital simulation. VR can be used for educational, entertainment, and even work purposes.

Virtual reality (VR) sickness

Virtual reality (VR) sickness occurs when a user experiences motion sickness from being in a VR environment. Symptoms can include headache, eye strain, nausea, disorientation, instability, and even vomiting.

Video game designer

A video game designer works on the creative side of video game development, occupying positions as diverse as art director to graphic designer and animator. As a result, video game designers are integral to creating the characters, plot, mechanics, and ideas upon which a game is based.