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Main Tech Trends in 3D Audio Content Creators Need to Pay Attention To

Apple 3D, Dolby Atmos, Oculus TV, Metaverse – a new standard of sharing content on the Internet came alive. From now on it is virtual reality and spatial audio that will shape the way we connect with each other in the pandemic and post-pandemic world. There is no turning back. Who doesn't want to follow the new, sooner or later will be left behind. There is, however, a great opportunity here – an opportunity for all kinds of content creators to realize their most bold ideas. To design worlds of their fantasies. All they need are just the right tools.

Imagine a popular music festival you've always wanted to experience in person – seeing the performers on stage and being surrounded by the music, the people, and the energy of the show. For one reason or another, you can't make it to the festival. But what if you could teleport yourself there? What if you could plug into an immersive experience that allows you to move freely through the whole audio soundscape and visual landscape? This is a promise of Facebook's Metaverse and Six Degrees of Freedom audio (6DoF)

6DoF audio and VR

True 6DoF experiences enable freedom of movement in 3D space, or along all three movement axes and all three rotational axes. Within this environment a person

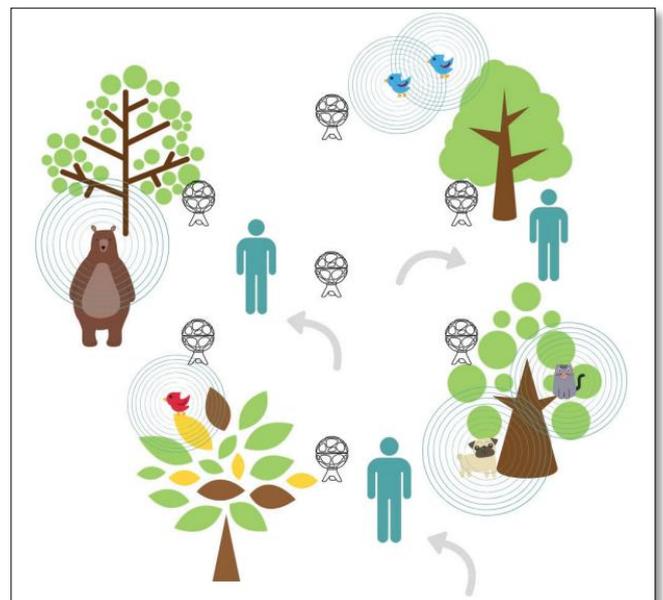


Figure 1: 6DoF technology in VR/AR enables the user to experience 3D audio/video content in the virtual space by introducing an unlimited number of listening and vantage points. Wearing an appropriate VR headset and headphones, you could walk along a tropical rainforest path, taking in the sights and sounds of animal life all around you.

can move forward/backward (surge), up/down (heave), and left/right (sway), and also rotate – yaw (normal axis), pitch (transverse axis), and roll (longitudinal axis) – to change orientation. With 6DoF technology in VR/AR, you can experience 3D audio/video content from an unlimited number of listening and vantage

points. Wearing an appropriate VR headset and headphones, you can use 6DoF to go anywhere. You can walk along a tropical rainforest path, taking in the sights and sounds of animal life all around you (see Figure 1).

360° audio-video experience

360° videos are already available on platforms including YouTube, Facebook or Vimeo. While people viewing or listening to a 360° scene can rotate to look in different directions or to hear audio from different direction, they themselves remain static. The 360° audio is similarly recorded. However, we can also create a multipoint 360° scene, where a viewer can jump between different listening and vantage points. This approach is particularly useful in case of streaming of a concert or other live event.

Standard for 360° filmmakers

Algorithms within associated software convert the signals from the recording device into the Ambisonics domain. Ambisonics is the full-sphere surround sound format that has become the standard for 360° filmmakers, and it covers not only the horizontal plane, but also sources “above” and “below” the listener (see Figure 2). Unlike other multichannel surround formats, the Ambisonics format carries speaker-independent representations of a sound field called B-format over its transmission channels. The sound field then can be decoded for playback on the target system or device. This approach gives content creators and engineers the flexibility to design sound in terms of source directions rather than loudspeaker positions.

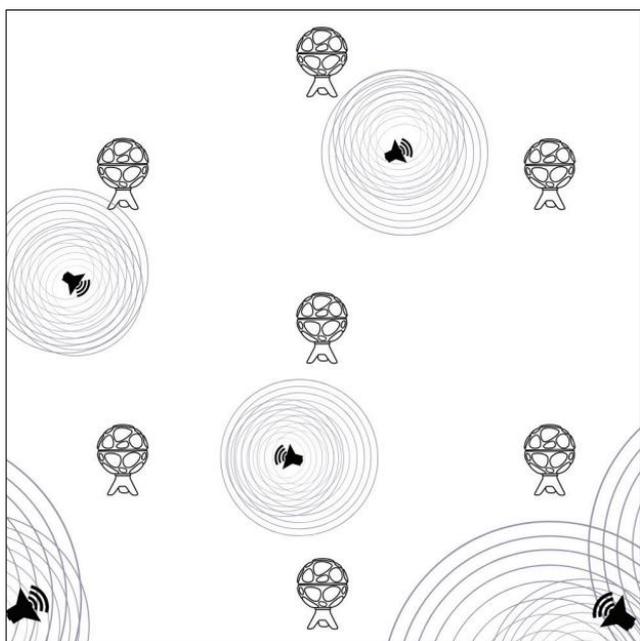


Figure 2: 6DoF technology with Ambisonics covers not only the horizontal plane, but also sources “above” and “below” the listener

Higher-order Ambisonics mixing

Higher-order Ambisonics allow engineers to create 3D sound tailored to headphones so that the listener experiences panoramic audio. Although this technique – binaural reproduction or binaural recording – is not new, the capture of audio with an Ambisonics microphone and decoding specifically for headphones makes for a listening experience that rivals reality. Going further, 6DoF audio in conjunction with virtual reality or augmented takes the experience to a whole new level by enabling the viewer to move freely throughout the scene. With the right software tools it is possible to process the data captured by the Ambisonics microphones and implement it into designed artificial 3D reality.

MPEG-I Immersive Audio standard

To support ongoing progress of immersive media adoption and popularization, MPEG is exploring technologies that enable 6DoF. Zylia was the first company that offered practical demonstrations of 6DoF audio enabling reproduction of the listening point from any given location in the scene. Company’s recordings have been adopted by MPEG as reference material for its standards work described in the paper, that was recently published by Audio Research Labs: https://mpeg.chiariglione.org/sites/default/files/events/3.%20MPEG-I_AudioPresentation.pdf

Easy tool for all content creators

It use to be extremely challenging to record high-quality sound from many sources present in the sound scene at the same time. Thanks to [Zylia’s 6DoF Navigable Audio](#) solution Content creators can easily experiment using multiple microphone array system in various spatial arrangements. The effect: explores of the virtual reality with implemented spatial sound can experience not only the rotation of the sound scene (360° audio), but also freely change their position with respect to the sound objects.

A crucial investment for the next 5 years

The technology for 6DoF audio is a solution that’s already on the market, with top companies and universities investing in exploring how 6DoF content can drive their applications and research during the next 5 years. Ultimately, the key to success lies in being able to create immersive live recorded content using 6DoF and bring that experience into peoples’ homes. The advancement of 6DoF audio using multiple Ambisonics microphone systems is laying the foundation for this near, exciting future.

Become a creator of the Metaverse

One of the most intriguing aspect of the Metaverse presented not long ago by Facebook CEO Mark Zuckerberg, is that it will be another world for creators

to share their work. ZYLIA 6DoF Navigable Audio solution was developed specifically to help them deliver a truly immersive experience with unrestricted freedom of movement through the recorded 3D audio space – so exactly a type of content Metaverse is looking for.

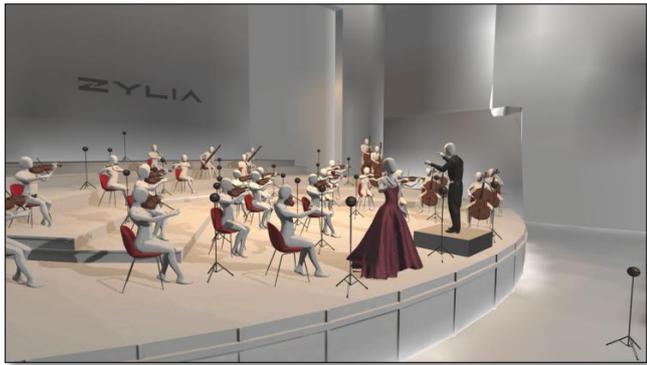


Figure 3: ZYLIA Concert Hall for Oculus VR headset

Zylia's 6DOF system of multiple synchronized ZM-1S microphone arrays puts serious unprecedented sound

capture capabilities in the hands of audio practitioners across many disciplines. What emerges is a new capacity for 3D processing and rendering of the music. We are pleased to be involved in this exciting development towards the enriched experience of listening to music.

Immersive Media Lab McGill University, Canada

If you are responsible in your organization for introducing new technologies talk to us about your current needs:

SCHEDULE A CALL WITH ZYLIA 3D AUDIO EXPERT

If you want to create content for Metaverse or other virtual reality platforms contact us, to find out about tools you can use in your work:

FILL UP THE CONTACT FORM

INSIGHTS

