Facebook focuses on smart audio for AR glasses

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Credit: Facebook

Inspirational speaker and Amazon best-selling author Sanjo Jendayi once said, "Listening doesn't always equate to hearing. Hearing doesn't always lead to understanding, but active listening helps each person truly 'see'

the other."

Jendayi was providing a little philosophical advice during a motivational speech, and technology was likely the last thing on her mind. But her words in fact might best describe the notion behind groundbreaking advances by the Facebook Reality Labs Research (FRLR) team's top scientists, programmers and designers.

A post on the FRLR web site last week provided a peek into where the social media giant is heading in the world of augmented reality and virtual reality.

"We are exploring new technologies that can extend, protect and enhance your hearing ability—giving you the ability to increase concentration and focus, while allowing you to seamlessly interact with the people and information you care about," said research team member Tony Miller.

Facebook, which originally planned to demonstrate advances in its AR smart glasses research in a conference this month that was canceled because of the pandemic, instead has been offering demonstrations to selected journalists and media specialists.

The demonstrations focus on two technologies, audio presence and enhanced hearing, which provide what FRLR calls "perceptual superpowers."

Enhanced hearing works like this: If you walk into a crowded bar where sounds from partying patrons, TVs, a live band, a noisy kitchen are merged into one cacophonous mass, imagine being able to isolate specific sounds you want to hear—a particular patron, the TV program or just the band— merely by looking at them. Through AI and sound suppression technology, merely looking at an object will enhance and

clarify the voice or sound while eliminating all other sounds outside your "vision," including chatter and other distracting noise such as air-conditioning.

An array of miniature microphones in the eyewear listens to all sounds, and other built-in components detect the position of one's head and movement of one's eyes in order to zero in on the target of interest.

When two individuals converse long distance, or video headgear places someone in a remote location, audio presence aims to make them feel they are there. Such presence is determined by measuring "interaural time" differences, the fractional differences in time it takes for a sound to reach each ear and differences in volume for each ear, as well as room acoustics.

Even the shape of one's ear is considered. Like a fingerprint, no two ears are shaped the same. All people have what researchers call their own head-related transfer function, or HRTF.

No two people's hearing profile will be identical. In order to optimize the perfect AR environment, researchers take numerous acoustic measures lasting a half hour. That includes testing how sounds interact with the design of each individual's unique pair of ears. Through AI, precisely measured acoustics can recreate an environment so realistic that subjects have difficulty distinguishing between actual voices of others in the same room and voices heard in an artificially created environment.

Smart glasses are not ready for commercial production yet. But it sounds like they're just around the corner.

More information: about.fb.com/news/2020/09/face … rch-future-of-

audio/

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