

# Getting DAP'd at concerts, museums and more

BY SANDRA SINAYUK

Recently, I had the opportunity to speak with Dr Nir Fink and Yami Thor about their products at Bettear and their new deep audio processing (DAP) AI-based technology. The purpose of Bettear is to improve inclusivity and accessibility for those that are hard of hearing, those with auditory processing difficulties, ADHD, or even normal hearing, in a variety of spaces. This is especially useful for acoustically complex situations such as background noise and rooms with a lot of reverberation. Bettear has a 'bring your own device' model where users connect to audio streams over Wi-Fi or Auracast™ via a smartphone app, allowing them to listen through hearing aids, cochlear implants, headphones or any other hearable device. The user simply opens the Bettear app and taps a button to search; it automatically connects to the Wi-Fi or Auracast™ devices installed in the venue, which streams the audio directly to the smartphone or to the hearable device. Yami, who worked as a sound technician previously, said he was inspired to start the company since settings that make the sound perfect to the sound technician aren't necessarily what is preferred by listeners with different auditory needs. So, other than being able to adjust the sound in real-time through the app, a unique feature is the ability to create a personalised 'mix'. The mix is customised to the user's listening preferences and takes any hearing loss into consideration. This is where DAP comes in.

In order to adapt mixes to users through DAP, they have collected data on approximately 1500 individuals with varying degrees of hearing loss, ages and needs. When it comes to music, for instance, they have found that preferences for how

a user prefers to hear singing versus instruments is correlated with degree of hearing loss, and have accounted for this in the DAP. Speech rate is another factor, and for those who struggle with a fast rate of speech, the DAP stretches the speech signal without causing audiovisual synchronisation issues (i.e. lip-sync). In addition to applications for the hard of hearing, the DAP team has found that individuals with ADHD also benefit from additional improvement in signal-to-noise ratio. Extra amplification of speech in a tricky setting with background noise – about 6–9 dB – was found to be helpful with ADHD individuals, as well as an adjustment in speech rate. In contrast to a standard mix from the sound technician at a venue, this is customisable and tailored to individual needs.

So far, the Bettear system is mostly used in entertainment spaces (music venues, theatres, cinema, sports), as well as art spaces (galleries, museums and tourist attractions) where multiple languages are available as well as synchronisation with visual media content. Another application is for education and, in certain venues, live transcription is available in the Bettear app. The cost of installing such a system depends on the size of the venue, but installation for a basic venue of about 500 seats would cost anywhere from \$3,000 USD to \$6,000 USD depending on the site's infrastructure. In the Bettear app, there is a map available to locate centres that offer the Bettear system, and I was hoping to find one near me in Toronto to test out. Unfortunately,

the closest was a five-hour flight away! In the future, they plan to expand more into Europe and North America, and have been adding more languages to their app: Hebrew, English, French, Arabic, Japanese and German. Additionally, they are planning to expand accessibility with DAP into the worlds of TVs, music, video conferencing apps, and more. Personally, I'm looking forward to trying it out when it comes to Toronto!

## User testimonial

A group of hard-of-hearing listeners were presented with an action movie audio trailer. The average overall satisfaction score was 22%. When these listeners were presented with the DAP-treated trailer, the average overall satisfaction score increased to 89%. One listener expressed her experience:

*"I am a movie enthusiast with hearing impairment, and at times, I miss sound effects that are essential for understanding the storyline and contain subtle nuances that foreshadow future events. After listening to the enhanced audio, I was able to comprehend these nuances more clearly. For instance, I could differentiate sounds like phone rings or helicopter noises, which were previously indistinct. Additionally, the dialogue became much clearer and easier to understand".*

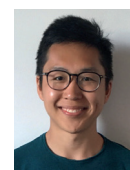
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