

IWAENC 2022 – Demo Proposal

Low delay processing for PureSound

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Abstract

In this demo, we will showcase the PureSound low delay processing technology introduced with the Widex MOMENT hearing aid series which delivers input/output latencies of approximately 0.5 ms. Such short delays contribute to minimizing the coloration typically present in hearing aids with open fits due to the combination of direct and amplified sound¹, and moreover enhance the neural encoding of the stimulus envelope² - all of which leads to a more natural sound. We will provide details on how we apply homomorphic filter design and minimum phase filter theory to achieve low delay with time-varying filtering and we will give attendants the possibility to listen to these devices. We will also discuss some of the open questions and challenges from this alternative approach.

What will be demoed

The audience will be able to listen via headphones to the ears of a Kemar dummy head equipped with a pair of Widex MOMENT hearing aid devices. The noisy microphone signals captured by the hearing aids will be processed in two different programs. The first program processes the signals with the conventional Widex time-varying delay between 5 ms at low frequencies and 2 ms at high frequencies while program 2 provides the processed signal in the lower delay of 0.5 ms. The audience will be able to compare and evaluate the quality of processed signals real-time in the conference hall soundscape.

In addition to the listening demonstration, the technical details of the exhibited technology will be presented.

Equipment

We will deploy a listening setup for up to 6 people consisting of

- Widex MOMENT HAs (configured with different programs) and accessories (chargers, remote control, programming interface)
- Kemar with preamplifier
- Listening amplifier with 6 outputs
- 6 headphones
- Loudspeaker (in case the demo is placed in a room with lower SNR, as the difference of the sound quality will be more pronounced in lower SNRs.
- Sanitizing material

¹ Stiefenhofer, G. (2022). Hearing aid delay in open-fit devices—coloration-pitch discrimination in normal-hearing and hearing-impaired. *International Journal of Audiology*, 1-9. ([Full article: Hearing aid delay in open-fit devices – coloration-pitch discrimination in normal-hearing and hearing-impaired \(tandfonline.com\)](#))

² Slugoeki, C., Kuk, F., Korhonen, P., & Ruperto, N. (2020). Neural Encoding of the Stimulus Envelope Facilitated by Widex ZeroDelay Technology. *Hearing Review*, 27(8), 28-31. ([Neural Encoding of the Stimulus Envelope Facilitated by Widex ZeroDelay Technology | The Hearing Review](#))