

Hybrid Expansive Frequency Compression for Enhancing Speech Perception by Individuals with High-Frequency Hearing Loss

Algorithm that enhances speech clarity by preserving fricatives and separating high/low frequencies without remapping.

Researchers at Purdue University have developed an algorithm that establishes parameters for audio signals in hearing aids based on a patient's severity of hearing loss. The ability to distinguish between high and low frequencies allows for faster user response, easing every day conversations as well as patient lifestyles. Hearing aids have been adapted to lower frequency through Hybrid Expansive Frequency Compression (hEFC) methods; however, hEFC technology often confuses between high and low frequencies. In addition, hEFC based systems cannot filter background noise and rarely recognize soft sounds like frication. Often, individuals with high frequency hearing loss will start to rely on memory of sounds, which leads to misidentification of phonemes. Purdue University has integrated new technology into hearing aids that keeps different sounds separate and enhances fricatives, affricates, and stop constant barriers.

Advantages:

- Faster signal time
- Eliminates need for frequency remapping
- Identifies spectral prominence of sound

Potential Applications:

- Hearing aids
- Assistive biotechnology

Technology Validation:

Technology ID

2019-ALEX-68705

Category

Digital Health &
Medtech/Wearable Health Tech
& Biosensors
Digital Health &
Medtech/Assistive & Diagnostic
Audio Technologies

Further information

Patrick Finnerty
pwfinnerty@prf.org

View online page



The new device uses a spectral balance between bandwidth filtered energy of input sound between 2500-4500 Hz and a high-bandpass filter with energy above 4500 Hz such that very high or low sound frequencies can be remapped and corrected before they are delivered.

TRL: 3

Intellectual Property:

Provisional-Patent, 2019-06-17, United States

Provisional-Patent, 2020-06-01, United States

Provisional-Patent, 2021-05-17, United States

Utility Patent, 2022-05-17, United States

Keywords: Algorithm, Assistive Technology, Audio Signals, Bandwidth, Frequency, Hearing Aids, Hearing Impaired, Medical device, Medical/Health, Signals, Sound Modulation, Spectral Range