![VolkswagenStiftung]

Musical Scene Analysis and Synthesis for Hearing-Impaired Listeners

Initiative: Freigeist-Fellowships

Bewilligung: 01.07.2019

Laufzeit: 5 Jahre

Projekt-Website: https://uol.de/en/music-perception

Musical sounds rarely go alone. In fact, the interplay and mix of instruments or voices is at the heart of music composition, performance, and production. Listeners separate polyphonic mixtures into foreground and background, or melody and accompaniment, through so-called auditory scene analysis. What if the ears become imprecise as for hearing-impaired individuals? Is it still possible to hear out a solo violin in the midst of an orchestra? In contrast to speech perception, research on music perception has traditionally not addressed hearing loss. As the first large-scale campaign into this topic, the goal of this project is to explore what makes music listening difficult for hearing-impaired listeners and why current hearing aids only poorly transmit music, whether by Beethoven or The Beatles. Specifically, the project will characterize scene analysis abilities of normal and hearing-impaired listeners using psychophysics and brain imaging, explore the acoustical determinants of musical sound clarity, and develop scene synthesis algorithms tailored to the needs of hearing-impaired listeners. By integrating methods from music psychology, psychophysics, signal processing, and computational neuroscience, this project will reveal groundbreaking insights into elementary principles of music listening and seed the foundations for future breakthroughs in hearing technology for music.

Projektbeteiligte

Dr. Kai Siedenburg
Universität Oldenburg
Fakultät VI - Medizin u. Gesundheitswissenschaften
Department für Medizinische Physik und Akustik
Oldenburg

Open Access-Publikationen

Listening in the mix: Lead vocals robustly attract auditory attention in popular music
A unitary model of frequency change perception
Exploring level- and spectrum-based music mixing transforms for hearing-impaired listeners
Development of an adaptive test of musical scene analysis abilities for normal-hearing and hearing-impaired listeners
Vibrotactile enhancement of musical engagement

Es werden die Institutionen genannt, an denen das Vorhaben durchgeführt wurde, und nicht die aktuelle Adresse.

26.04.2024

2