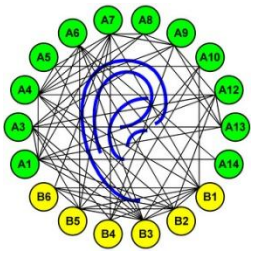
Sonderforschungsbereich/Transregio 31
"Das aktive Gehör"



E I N L A D U N G

zum Vortrag im Rahmen des Seminars des SFB/TRR 31

Freitag, 26. April 2013, 14 Uhr c.t.

im Raum W2 1-143 der Universität Oldenburg
und Raum H28 / R 2.31 des Med. Campus Magdeburg
(per Videoübertragung)

"Audio Information Processing for Hearing Devices - An Overview of our research on binaural hearing and cochlear implants"

Bernhard Seeber

Inst. for Neuroscience
University of Nottingham

Cochlear implants are neural prostheses which give a sense of hearing to deaf people by stimulating the auditory nerve. In many users they restore the ability to understand speech in quiet, but noise and reverberation cause severe problems. It seems that implant users have difficulties hearing out one source in a potpourri of sources. This so called "auditory scene analysis" relies, amongst other cues, on binaural information which is degraded with implants. Our research focusses on the coding of monaural and binaural information to improve source segregation and the perception of sound direction. I will present results demonstrating the severe impact of reverberation on sound localization with bilateral cochlear implants. This clinically oriented research shows that localization of stimuli with transient components is more robust against reverberation than that of other stimuli, such as speech (Kerber and Seeber, J Assoc Res Otolaryngol, 2013). This outcome motivates a novel approach for improving localization in noisy situations. Instead of reducing the energy of the interfering reverberation or noise we aim to increase the perceptual saliency of the cues used to locate sounds in reverberation. In simulations of implant use with normal-hearing listeners we demonstrate that by changing the coding of the target sound to better transmit its binaural cues, it can be localized better in reverberation. The new approach only alters the transmitted envelope signal and can thus be implemented in commercial devices without changing the implanted part.

Supported by the Medical Research Council (UK), grant U135097132, and the Bernstein Centre for Computational Neuroscience Munich.