Perception-Based Personalization of Hearing Aids Using Gaussian Processes and Active Learning

Personalization of multi-parameter hearing aids involves an initial fitting followed by a manual knowledge-based trial-and-error fine-tuning from ambiguous verbal user feedback. The result is an often suboptimal HA setting whereby the full potential of modern hearing aids is not utilized. This article proposes an interactive hearing-aids personalization system that obtains an optimal individual setting of the hearing aids from direct perceptual user feedback. Results obtained with ten hearing-impaired subjects show that ten to twenty pairwise user assessments between different settings—equivalent to 5-10 min—is sufficient for personalization of up to four hearing-aid parameters. A setting obtained by the system was significantly preferred by the subject over the initial fitting, and the obtained setting could be reproduced with reasonable precision. The system may have potential for clinical usage to assist both the hearing-care professional and the user.

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