Technical University of Denmark

Popular science summary of the PhD thesis

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Title of the PhD thesis	Perceptual effects of non-linear hearing aid amplification strategies
PhD school/Department	Hearing Systems group – Department of Electrical Engineering

Science summary

* Please give a short popular abstract in either Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof:

One of the most common reported complaints from people with sensorineural hearing loss is difficulties in understanding speech in complex acoustic environments. Some of these difficulties are caused by loss of cochlear compression, reflecting a reduced sensitivity to soft sounds, steeper growth of loudness and a different temporal resolution than observed in normal-hearing people. In an attempt to compensate for the loss of cochlear compression, many modern hearing aids use a compressive amplification strategy. However, while speech perception might be improved by hearing-aid compression, the processing may lead to undesired distortions of the binaural cues which are essential for spatial perception. In the first study presented in this thesis, the influence of hearing-aid compression and hearing loss on two measures of temporal resolution was investigated. In the second study, the influence of speech enhancement schemes on consonant recognition was investigated. This scheme was designed to compensate for the degraded modulation-depth discrimination sensitivity observed in hearing-impaired listeners. In the third study, the effect of conventional hearing-aid compression schemes on spatial perception in a reverberant environment was investigated. In the fourth study, the benefit of a direct-sound driven compression system was investigated that adaptively selects appropriate time constants in an attempt to preserve the listener's spatial impression. Overall, it is expected that the outcomes of this thesis facilitate the development and implementation of better hearing-aid signal processing strategies for the benefit of hearing-aid users.

Please email the abstract to the PhD secretary at the department