

# *Amplification & Communication Research Laboratory*

## **I. Optimization of Hearing Aid, Cochlear Implant and Hearing Protector Performance**



*All hearing device users face similar challenges: Understanding speech in noise and listening comfort. Dr. Chung enjoys examining the effective signal processing strategies and technologies to enhance the performance of hearing instruments, especially those that can improve their communication abilities and quality of lives. She has been working on utilizing hearing aid front-end technologies to enhance cochlear implant performance since 2003, and has a patent on the subject with Dr. Fangang Zeng at University of California, Irvine.*

[Chung, K. & Zeng, F.G. \(2015\). Enhancing cochlear implants with hearing aid signal processing technologies. US Patent No. 8,942,815.](#)

[Chung, K., Nelson, L. A., & Teske, M. \(2012\) Noise reduction techniques implemented in head-worn preprocessors for improving cochlear implant performance in reverberant noise fields. Hearing Research, 291\(1-2\), 41-51.](#)

[Chung, K., Tufts, J., & Nelson, L.A. \(2009\). Modulation-based Digital Noise Reduction for Application to Hearing Protectors to Reduce Overall Noise Level and Maintain Speech Intelligibility. Human Factors, 51\(1\), 78-89.](#)

[Chung, K., & Zeng, F-G. \(2009\). Using adaptive directional microphones to enhance cochlear implant performance. Hearing Research, 250, 27-37.](#)

[Chung, K. \(2007\). Effective compression and noise reduction configurations for hearing protectors. Journal of Acoustical Society of America, 121\(2\), 1090-1101.](#)

[Wagoner, L., McGlothlin, J., Chung, K., Strickland, E., Zimmerman, N. & Carlson, G. \(2007\). Evaluation of noise attenuation and verbal communication capabilities using three ear insert hearing protection systems among airport maintenance personnel. Journal of Occupational and Environmental Hygiene, 4, 114-122.](#)

[Chung, K., Killion, M.C. & Christensen, L.A. \(2007\). Ranking hearing aid input-output functions for understanding low-level, conversational and high-level speech in multi-talker babble. Journal of Speech Language Hearing Research, 50, 1-19.](#)

[Chung, K., Zeng, F-G & Acker, K.N. \(2006\). Effects of directional microphone and adaptive multi-channel noise reduction algorithm on cochlear implant performance. Journal of Acoustical Society of America, 120\(4\), 2216-2227.](#)

[Chung, K., Zeng, F-G & Waltzman, S. \(2004\). Using hearing aid directional microphones and noise reduction algorithms to enhance cochlear implant performance, Acoustical Research Letters Online, 5\(2\), 56-61.](#)

[Chung, K., Zeng, F-G & Waltzman, S. \(2004\). Utilizing advanced hearing aid technologies as pre-processors to enhance cochlear implant performance. The proceedings of the fourth Asian-Pacific Symposium on Cochlear Implant and Related Sciences, Cochlear Implant International, 5\(1, suppl. 1\), 192-195.](#)

[Chung, K., Zeng, F-G, Waltzman, S. \(2004\). Utilizing hearing aid directional microphones and noise reduction algorithms to improve speech understanding and listening preferences of cochlear implant users. International Congress Series. Nov2004, Vol. 1273, p89-92.](#)

[Killion, M.C., Schulein, R., Christensen, L., Fabry, D., Revit, L., Niquette, P. & Chung, K. \(1998\). Real-world performance of an ITE directional microphone. Hearing Journal, 51\(4\), 24-38.](#)