Adaptive Feedback Cancellation With Band-Limited LPC Vocoder in Digital Hearing Aids - DTU Orbit (12/08/2019)

Adaptive Feedback Cancellation With Band-Limited LPC Vocoder in Digital Hearing Aids

Feedback oscillation is one of the major issues with hearing aids. An effective way of feedback suppression is adaptive feedback cancellation, which uses an adaptive filter to estimate the feedback path. However, when the external input signal is correlated with the receiver input signal, the estimate of the feedback path is biased. This so-called "bias problem" results in a large modeling error and a cancellation of the desired signal. This paper proposes a band-limited linear predictive coding based approach to reduce the bias. The idea is to replace the hearing-aid output with a synthesized signal, which sounds perceptually the same as or similar to the original signal but is statistically uncorrelated with the external input signal at high frequencies where feedback oscillation usually occurs. Simulation results show that the proposed algorithm can effectively reduce the bias and the misalignment between the real and the estimated feedback path. When combined with filtered-X adaptation in the feedback canceller, this approach reduces the misalignment even further.

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