Problems of Acoustic Echo Cancellation

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Abstract

The need for clean and clearly audible communication channels is still growing nowadays, so we have started to investigate whether a widely known codec optimized for speech, titled Speex, is able to take up this challenge. Because Speex is freely available and open for any kind of experimentations, and because it incorporates a relatively contemporary and acceptable approach of acoustic echo cancellation by now, it would be desirable to push its possibilities and efficiency to the maximal rate. This is also suggested by the fact that many programmers and so real-life applications are already building upon Speex as a popular choice. Nevertheless, it is a great summation of the fresh improvements achieved in this field.

Our experiments and observations are about to give ideas to make the echo cancellation algorithm built in Speex more accurate especially in double-talk conditions. Furthermore, we would like to loose some of the initial (sometimes strong) assumptions about the nature of processed speech signals.

Keywords: acoustic echo cancellation, multidelay block frequency filtering (MDF), NLMS algorithm, speech enhancement, speech processing, adaptive filtering, double-talk, residual echo estimation, leakage estimation, echo path change

MSC: 68U99 (Computing Methodologies and Applications)

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