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# Time Delay Estimation Using Signal Envelopes for Synchronisation of Recordings

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**Abstract :** In this work, a method of time delay estimation for dual-channel acoustic signals (speech, music, etc.) recorded under reverberant conditions is investigated. Standard methods based on cross-correlation of the signals show poor results in cases involving strong reverberation, large distances between microphones and asynchronous recordings. Under similar conditions, a method based on cross-correlation of temporal envelopes of the signals delivers a delay estimation of acceptable quality. This method and its properties are described and investigated in detail, including its limits of applicability. The method's optimal parameter estimation and a comparison with other known methods of time delay estimation are also provided.

**Keywords :** cross-correlation, delay estimation, signal envelope, signal processing
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