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Analysis of the Hilbert Spectrum for Text-Dependent Speaker Verification

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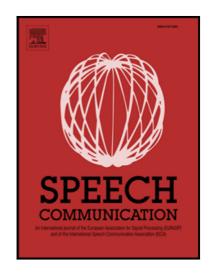
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#### ACCEPTED MANUSCRIPT

#### Highlights

- The constituents of the Hilbert spectrum of the speech signal, i.e., the instantaneous frequencies and energies of its intrinsic mode functions (IMFs), are used for extracting features for Text-Dependent Speaker verification (TDSV), under mismatched and practical testing scenarios.
- The IMFs of the speech signal are obtained using Modified Empirical Mode Decomposition (MEMD). Seven different features are obtained from the instantaneous frequencies and energies of the IMFs.
- Though the seven features are not effective individually, in combination with the MFCCs they provide enhanced performance of the TDSV system. The seven features are useful at very low dimensions (<= 4). Thus, only the first few IMFs are useful in extracting features.
- The performances of the TDSV system on the RSR2015 corpus show that the seven experimental features are effective not only for clean speech, but when the testing utterances are corrupted by Babble noise (simulating interference from adjacent speakers).
- The performances of the TDSV system on the IITG corpus show that the seven experimental features are effective under telephone channel conditions, and under changing channel conditions and environmental noise.



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