Bidirectional Dynamic Time Warping Algorithm for the Recognition of Isolated Words Impacted by Transient Noise Pulses

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Abstract : We consider the biggest challenge in speech recognition – noise reduction. Traditionally detected transient noise pulses are removed with the corrupted speech using pulse models. In this paper we propose to cope with the problem directly in Dynamic Time Warping domain. Bidirectional Dynamic Time Warping algorithm for the recognition of isolated words impacted by transient noise pulses is proposed. It uses simple transient noise pulse detector, employs bidirectional computation of dynamic time warping and directly manipulates with warping results. Experimental investigation with several alternative solutions confirms effectiveness of the proposed algorithm in the reduction of impact of noise on recognition process – 3.9% increase of the noisy speech recognition is achieved.
Keywords : transient noise pulses, noise reduction, dynamic time warping, speech recognition
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