عنوان مقاله:

Speech Enhancement using Greedy Dictionary Learning and Sparse Recovery

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خلاصه مقاله:

Most real-time speech signals are frequently disrupted by noise such as traffic, babbling, and background noises, among other things. The goal of speech denoising is to extract the clean speech signal from as many distorted components as possible. For speech denoising, many researchers worked on sparse representation and dictionary learning algorithms. These algorithms, however, have many disadvantages, including being overcomplete, computationally expensive, and susceptible to orthogonality restrictions, as well as a lack of arithmetic precision due to the usage of double-precision. We propose a greedy technique for dictionary learning with sparse representation to overcome these concerns. In this technique, the input signal's singular value decomposition is used to exploit orthogonality, and here the ℓ۱-ℓ۲ norm is employed to obtain sparsity to learn the dictionary. It improves dictionary learning by overcoming the orthogonality constraint, the three-sigma rule-based number of iterations, and the overcomplete nature. And this technique has resulted in improved performance as well as reduced computing complexity. With a bit-precision of Q۷ fixed-point arithmetic, this approach is also used in resource-constrained embedded systems, and the performance is considerably better than other algorithms. The greedy approach .outperforms the other two in terms of SNR, Short-Time Objective Intelligibility, and computing time

کلمات کلیدی:

Sparse representation, Greedy Dictionary Learning, Singular Value Decomposition, Orthogonal Matching Pursuit, Quantization