Sparse Signal Restoration Algorithm Based on Piecewise Adaptive Backtracking Orthogonal Least Squares

Authors : Linyu Wang, Jiahui Ma, Jianhong Xiang, Hanyu Jiang

Abstract : the traditional greedy compressed sensing algorithm needs to know the signal sparsity when recovering the signal, but the signal sparsity in the practical application can not be obtained as a priori information, and the recovery accuracy is low, which does not meet the needs of practical application. To solve this problem, this paper puts forward Piecewise adaptive backtracking orthogonal least squares algorithm. The algorithm is divided into two stages. In the first stage, the sparsity pre-estimation strategy is adopted, which can quickly approach the real sparsity and reduce time consumption. In the second stage iteration, the correction strategy and adaptive step size are used to accurately estimate the sparsity, and the backtracking idea is introduced to improve the accuracy of signal recovery. Through experimental simulation, the algorithm can accurately recover the estimated signal with fewer iterations when the sparsity is unknown.

Keywords : compressed sensing, greedy algorithm, least square method, adaptive reconstruction
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