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Poster : Incident Signals Estimation Based on a Modified MCA Learning Algorithm

Authors : Rashid Ahmed , John N. Avaritsiotis

Abstract : Many signal subspace-based approaches have already been proposed for determining the fixed Direction of Arrival (DOA) of plane waves impinging on an array of sensors. Two procedures for DOA estimation based neural networks are presented. First, Principal Component Analysis (PCA) is employed to extract the maximum eigenvalue and eigenvector from signal subspace to estimate DOA. Second, minor component analysis (MCA) is a statistical method of extracting the eigenvector associated with the smallest eigenvalue of the covariance matrix. In this paper, we will modify a Minor Component Analysis (MCA(R)) learning algorithm to enhance the convergence, where a convergence is essential for MCA algorithm towards practical applications. The learning rate parameter is also presented, which ensures fast convergence of the algorithm, because it has direct effect on the convergence of the weight vector and the error level is affected by this value. MCA is performed to determine the estimated DOA. Preliminary results will be furnished to illustrate the convergences results achieved.

Keywords : Direction of Arrival, neural networks, Principle Component Analysis, Minor Component Analysis
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