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Abstract

Many algorithms have been proposed in recent years for source localization in near field. Some are based on subspace methods and some use evolutionary computing techniques. This article presents the performance of Differential Evolution (DE) algorithm for range and DOA estimation of near field narrow band sources, impinging on a uniform linear array (ULA) of passive sensors. Mean square error (MSE) is used as a fitness function because it requires only a single snapshot to converge and perform better even in negative SNR. The main contribution of this work is to explore the effectiveness of DE without hybridization for uniform linear arrays. The results of DE are compared with the results of Genetic Algorithm (GA). The effectiveness of both the algorithms is tested on the basis of a large number of Monte-Carlo simulations and their statistical analysis.

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Index Terms

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Keywords

Differential Evolution, Direction of Arrival, Evolutionary Computing, Near field, Source Localization.