Abstract

Efficient utilization of limited radio frequency spectrum is only possible to use smart/adaptive antenna system. Smart antenna radiates not only narrow beam towards desired users exploiting signal processing capability but also places null towards interferers, thus optimizing the signal quality and enhancing capacity. Least mean square (LMS) and normalized least mean square (NLMS) are two adaptive beamforming algorithms which are presented in this paper. Smart antenna incorporates these algorithms in coded form which calculates complex weights according to the signal environment. The efficiency of LMS and NLMS algorithms is compared on the basis of normalized array factor and mean square error (MSE) for mobile communication. Simulation results reveal that both algorithms have high resolution for beam formation. However LMS has good performance to minimize MSE as compared to NLMS. Therefore, LMS is found more efficient algorithm to implement in the mobile communication environment to minimize MSE and enhancing capacity.
Performance Analysis of LMS and NLMS Algorithms for a Smart Antenna System

Reference


Index Terms

Computer Science

Signal Processing

Key words

Least Mean Square (LMS) Algorithm
Normalized Least
Mean Square (NLMS) Algorithm