BAYESIAN MAXIMUM A POSTERIOR DOA ESTIMATOR BASED ON GIBBS SAMPLING (TueAmPO2)

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Abstract :

DOA estimation is an important research area in array signal processing. Bayesian maximum a posterior DOA estimator (BM DOA estimator) has been shown to possess excellent performance. However, the BM estimator requires a multidimensional search and the computation burden increases exponentially with the dimension. So it is difficult to be used in real time applications. In order to reduce the computation of BM DOA Estimator, Monte Carlo methods are applied and a novel Bayesian Maximum a posterior DOA Estimator based on Gibbs Sampling (GSBM) is proposed. GSBM does not need multidimensional search, and not only keeps the good performance of original BM, but also reduces the original computation complexity from O(LK) to O(KxJxNs) where L,K,J and Ns are the number of grid, sources, samples and iteration respectively . Simulation results show that GSBM performs better than Maximum Likelihood Estimator (MLE), MUSIC, and MiniNorm, especially in low SNRs.

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