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Considering the Reliability of Measurements Issue in Distributed Adaptive Estimation Algorithms

Authors : Wael M. Bazzi, Amir Rastegarnia, Azam Khalili

Abstract : In this paper we consider the issue of reliability of measurements in distributed adaptive estimation problem. To this aim, we assume a sensor network with different observation noise variance among the sensors and propose new estimation method based on incremental distributed least mean-square (IDLMS) algorithm. The proposed method contains two phases: I) Estimation of each sensors observation noise variance, and II) Estimation of the desired parameter using the estimated observation variances. To deal with the reliability of measurements, in the second phase of the proposed algorithm, the step-size parameter is adjusted for each sensor according to its observation noise variance. As our simulation results show, the proposed algorithm considerably improves the performance of the IDLMS algorithm in the same condition.

Keywords : adaptive filter, distributed estimation, sensor network, IDLMS algorithm
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