World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:11, No:02, 2017

Hybrid Subspace Approach for Time Delay Estimation in MIMO Systems

Authors : Mojtaba Saeedinezhad, Sarah Yousefi

Abstract : In this paper, we present a hybrid subspace approach for Time Delay Estimation (TDE) in multivariable systems. While several methods have been proposed for time delay estimation in SISO systems, delay estimation in MIMO systems were always a big challenge. In these systems the existing TDE methods have significant limitations because most of procedures are just based on system response estimation or correlation analysis. We introduce a new hybrid method for TDE in MIMO systems based on subspace identification and explicit output error method; and compare its performance with previously introduced procedures in presence of different noise levels and in a statistical manner. Then the best method is selected with multi objective decision making technique. It is shown that the performance of new approach is much better than the existing methods, even in low signal-to-noise conditions.

Keywords : system identification, time delay estimation, ARX, OE, merit ratio, multi variable decision making
Conference Title : ICCASM 2017 : International Conference on Control Applications, Systems and Methods
Conference Location : Venice, Italy
Conference Dates : February 16-17, 2017

Open Science Index, Electrical and Computer Engineering Vol:11, No:02, 2017 publications.waset.org/abstracts/48722/pdf