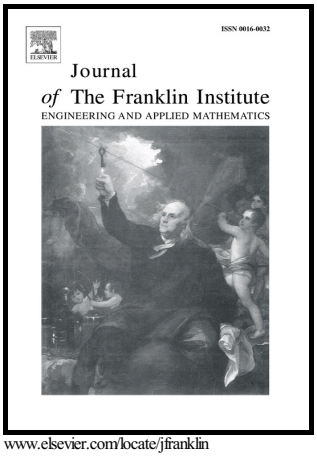

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Bias compensation principle based recursive least squares identification method for Hammerstein nonlinear systems

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Abstract

This paper presents a bias compensation principle based recursive least squares (BCP-RLS) identification method for Hammerstein nonlinear autoregressive moving average with exogenous variable (ARMAX) systems. By introducing a non-singular matrix and an auxiliary vector uncorrelated with the noise term, we firstly establish the BCP-RLS unified framework. Next the convergence and consistency properties of the achieved BCP-RLS method are rigorously analyzed without the martingale difference sequence assumption or the strictly positive real condition. Furthermore, some discussions on the flexibility of the BCP-RLS method and its comparisons with some other existing methods are presented. Finally, some representative simulation examples are conducted to verify the obtained results.

Keywords

Hammerstein systems; bias compensation; recursive identification; convergence; consistency; simulation.