DETECTION AND TRACKING OF NON−STATIONARY TRANSIENT SIGNALS BASED ON THE INNOVATIONS FILTER (WedAmOR4)

Author(s) :

Maciej Lopatka (University of Paris XII and Wroclaw University of Technology, France)
Olivier Adam (University of Paris XII, France)
Christophe Laplanche (University of Paris XII, France)
Jean−François Motsch (University of Paris XII, France)
Jan Zarzycki (Wroclaw University of Technology, Poland)

Abstract :

The paper shows an efficient detection and tracking algorithm that is based on the adaptive optimal orthogonal parameterisation. The model parameters, being a solution to second−order signal prediction, are updated at every time−instant, thus making this approach well adapted to detection and tracking problems. The proposed approach is robust in the sense of resistance to the continuously present noise. The innovations filter proposed as the transient signal detector is a lattice structure optimal orthogonal filter that is characterized by an extremely fast start−up performance and excellent convergence behaviour. At every sample the proposed method calculates recursively a set of reflection coefficients, which we propose to use in detection and second−order signal description. We demonstrate performances of the proposed approach by introducing the Receiver−Operating Characteristics curves in different algorithm aspects and for different SNR. The algorithm is well suited to the real−time application.

Menu