A Filtering Algorithm for a Nonlinear State-Space Model

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Abstract : Kalman filter is a famous algorithm that utilizes to estimate the state in the linear systems. It has numerous applications in technology and science. Since of the most of applications in real life can be described by nonlinear systems. So, Kalman filter does not work with the nonlinear systems because it is suitable to linear systems only. In this work, a nonlinear filtering algorithm is presented which is suitable to use with the special kinds of nonlinear systems. This filter generalizes the Kalman filter. This means that this filter also can be used for the linear systems. Our algorithm depends on a special linearization of the second degree. We introduced the nonlinear algorithm with a bilinear state-space model. A simulation example is presented to illustrate the efficiency of the algorithm.
Keywords : Kalman filter, filtering algorithm, nonlinear systems, state-space model
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