

基于伪测量方程模型库的延迟量测滤波

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A New Delay Measurement Filter Based on Pseudo-measurement Model Library

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摘要

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摘要 信息在传感器网络传输过程中会出现延迟、错序和丢包等现象, 如何充分地利用这些信息对有效提高状态估计精度非常重要。针对现有延迟量测滤波方法中存在的问题, 本文基于所建立的伪测量方程模型库, 提出一种用于处理延迟量测的滤波方法。首先, 利用线性定常系统的参数时不变特性, 在测量值有限延迟条件下建立伪测量方程模型库; 然后, 基于当前时刻到来的延迟或即时测量数据, 在模型库中选取与之对应的测量方程模型, 并结合系统状态模型, 建立系统状态的预测估计器或滤波估计器或滤波融合估计器。仿真对比验证了新方法的有效性 with 最优性。

关键词: 无线传感网 信息处理 延迟量测 滤波估计 伪测量方程模型库

Abstract: Information transferring process in sensor network will appear delay, out-of-sequence even dropout. How to make full use of such information is extremely important to improve state estimation accuracy. In order to further overcome the problems in the existing methods, a novel delay measurement filter based on the pseudo-measurement model library is proposed in this paper. Firstly, a pseudo-measurement model library under finite delay case is built for the linear time invariant system with the invariant parameters property. Secondly, according to current time arrival delay or real time measurement, the corresponding model is selected in the model library. Thirdly, a new hybrid filter with predict-estimator, filter-estimator and fusion-estimator is proposed for the system described by the selected measurement model and the state model. The simulations illustrate the effectiveness and optimality of the proposed method.

Keywords: Wireless sensor network Information processing Delay measurement Filtering estimation Pseudo-measurement model library

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