

一种二元探测传感器网络目标跟踪算法

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摘要:

针对二元探测传感器网络目标定位与跟踪问题, 提出一种递推的质心定位方法, 推导出了质心定位算法的递推公式。采用序贯最小二乘估计方法, 提出了基于递推计算的质心定位结果进行目标跟踪的算法。算法以简单的观测噪声模型体现系统的测量和计算误差, 利用序贯最小二乘算法的可变增益, 提高了跟踪精度; 算法不需要先验统计信息以及序贯式的处理方式等因素, 降低了算法的计算复杂度。仿真结果验证了递推公式的正确性和跟踪算法的有效性。

关键词: 传感器网络; 目标跟踪; 二元探测; 质心算法; 最小二乘估计

An Object Tracking Algorithm for Binary Sensor Networks

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Abstract:

Aiming at the issue of object localization and tracking by binary sensor networks, a localization approach based on centroid algorithm is presented. A recursive computing formula for centroid algorithm has also been deduced. An object tracking algorithm is further presented, which is based on the localization results and employs a sequential least square estimation method. The algorithm enhances its tracking accuracy by adopting a simple observed noise model to represent the measure errors and the computation errors, and employing a variable plus benefit of least square estimation to improve tracking precision. Such factors as sequential computation idea and no prior statistical information decrease the computation complexity of the tracking algorithm. Simulations demonstrate the validity of the recursive formula and the tracking algorithm.

Keywords: Sensor networks; object tracking; binary detection; centroid algorithm; least squares estimation

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