

无线传感器网络分布式多目标跟踪算法研究

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摘要：

由于无线传感器网络的资源有限，集中式多目标跟踪算法在无线传感器网络多目标跟踪中受到限制。在无线声音传感器网络下，基于动态分簇结构，提出了一种分布式多目标跟踪算法。每个传感器的测量为来自单个目标或多个目标的声音信号和噪声的叠加。每个目标对应于一个粒子滤波，当目标之间的距离较远时，进行单目标跟踪，当目标之间距离较近相互影响时，各个主节点通过信息交换实现对多目标的分布式跟踪。仿真结果验证了算法的有效性。

关键词：无线传感器网络；多目标跟踪；分布式算法；粒子滤波；声音能量

Distributed Multi-target Tracking in Wireless Sensor Network

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Abstract:

Due to the limited resources of wireless sensor network, existing centralized algorithms for tracking multi-target are incapable when being used in wireless sensor network. A distributed algorithm based on dynamic clustering is presented to track multi-target in wireless acoustic sensor network, where the sensor data represent measurements of acoustic signals from one or more targets and background noise. The algorithm runs a separate particle filter for each target. When one target is far from the others, it is tracked by its particle filter as single target tracking. However, when some targets are close to each other, the algorithm can track them distributedly by their main nodes exchanging information. The simulation results prove the effectiveness of the new algorithm.

Keywords: wireless sensor network; multiple target tracking; distributed algorithm; particle filter; acoustic energy

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