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二进制传感器网络加权目标跟踪算法研究

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The Study on Weighted Target Tracking Algorithm for Binary Sensor Networks

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摘要 该文主要研究二进制传感器网络中加权目标跟踪算法的设计。针对已有算法中权值不能实时反映目标与感测节点之间距离关系的缺点，提出了距离加权和基于预测的距离加权目标跟踪算法。距离权值能够实时反映目标与各个感测节点间的距离关系，因此具有更高的跟踪精度。在距离加权算法中感测节点需要将感测信息和距离信息都传输到融合中心，这会增大感测节点的能量消耗。为了解决这个问题，文中提出一种基于预测的距离加权目标跟踪算法。该算法中感测节点不需要传输距离信息而只传输感测信息到融合中心从而减少了能耗。仿真结果表明，基于预测的距离加权算法比已有算法能够够精确地跟踪目标，在保证跟踪精度的同时减少了通信能耗。

关键词： 二进制传感器网络 目标跟踪 距离加权 预测距离加权

Abstract：The research focus of this paper is to design a novel target tracking algorithm for binary sensor network (BSN). The weight in existing algorithms can not reflect the realtime relationship between target and sensing nodes. Distance weighted target tracking algorithm is proposed, in which the distance weight can reflect the realtime relationship between target and senisng nodes and thererfore has better performance than the existing algorithms. In distance weighted algorithm, sensing node should transmit both sensing information and distance information to the fusion center and consum more energy. Prediction-based distance weighted target tracking algorithm is provided, which can reduce energy consumption by the transmission of only sensing information. Simulation results show that prediction-based distance weighted algorithm can not only guarantee the tracking accuracy but also reduce energy consumption, compared with the existent algorithms.

Keywords： Binary Sensor Network (BSN)   Target tracking   Distance Weight (DW)   Prediction-based Distance Weight (PDW)

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