多传感器网络中的分布式故障检测算法

作　者：徐向华, 周彪, 万健

单　位：杭州电子科技大学计算机学院

摘　要：

在传感器网络中，分布式故障检测算法（DFD算法）通过与所有邻居节点的传感器数据的比较判断，实现节点传感器的故障检测。但是，在故障节点聚集的网络区域，故障节点比例的上升将导致该区域的故障检测精度显著下降。针对多传感器网络，本文利用多传感器在相同区域的故障分布差异及传感器之间关联特性对DFD故障检测算法进行改进，提出适用于多传感器网络的MDFD算法，提高了故障聚集区域的检测精度。性能分析和仿真结果表明：在节点故障率高的网络中，与DFD和IDFD算法相比，MDFD提高了故障检测精度，算法适用于节点分布稀疏和传感器故障率较高的网络。

关键词：多传感器网络；故障检测；MDFD算法；故障聚集；

MDFD: Distributed Fault Detection for Multi-sensor Networks

Author's Name:

Institution:

Abstract:

In wireless sensor networks, the Distributed Fault Detection algorithm (DFD) compares the sensing data among its neighboring nodes to achieve fault detection. However, in areas with high density of faulty nodes, the increase of faulty nodes will lead to a significant decline in the accuracy of fault detection. In this paper, the sensor data correlation between multi sensors is exploited to improve performance of the DFD fault detection algorithm in the multi-sensor networks. The MDFD algorithm is proposed for multi-sensor network fault detection to enhance the accuracy of fault detection in the network area with high fault distribution. The performance analysis and simulation results demonstrate that the fault detection accuracy of MDFD algorithm is higher than DFD and IDFD algorithm, MDFD algorithm is more suitable for fault detection in sensor networks with low node density and higher failure ratio.

Keywords: multi-sensor networks; fault detection; MDFD algorithm; Fault aggregation;

投稿时间：**2009-09-03**

查看pdf文件