[2008-1038] 基于优化策略的混合定位算法

郝志凯,王硕,谭民

摘要
本文针对无线传感器网络的应用需求提出一种基于优化策略的混合节点定位算法.选择1-hop节点最多的点作为初始点,利用MDS(Multi-dimensional Scaling)方法计算初始节点及其1-hop节点的相对坐标并将这些节点的坐标发送给周围未定位节点;未定位的节点根据接收到的坐标与节点间的距离利用极大似然法估算自身的坐标;最后通过坐标变换计算所有节点的绝对坐标.在此基础上,进一步提出将本文节点定位算法与集中式和分布式优化策略相结合来优化网络节点的估计坐标,以提高节点定位精度.仿真结果表明本文提出的算法是有效的,能够较好地完成无线传感器网络节点的定位.

关键词　　无线传感器网络　定位　优化　多维标度
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[2008-1038] Hybrid Positioning Algorithm Based on Optimization

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Abstract
In this paper, a hybrid positioning algorithm based on optimization is proposed for applications of wireless sensor networks (WSNs). The presented method starts from the initial node which has most neighbors in the network, and then the relative coordinates of the initial node and its neighbors are estimated by MDS algorithm and broadcasted. The un-localized nodes estimate their coordinates with the maximum likelihood algorithm based on their received coordinates and ranged distances to each neighbor. In the end, all nodes' absolute coordinates are obtained by coordinate translation. Further more, the global and distributed optimization strategies are integrated into the presented algorithm respectively for improving the positioning precision. The simulation results show that the proposed algorithms are valid and can localize sensor nodes more precisely.

Key words　Wireless sensor networks　localization　optimization　MDS

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