

改进的分布式无线传感器网络多维标度定位算法

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摘要:

为提高无线传感器网络集中式多维标度MDS-MAP算法的定位精度, 提出了一种改进的基于MDS的分布式定位算法。该算法在构建距离矩阵时引入Euclidean算法距离估算思想, 同时采用一种优化的基于最小二乘逼近的坐标转换方法实现节点由相对坐标到绝对坐标的转换。实验结果显示, 与经典MDS-MAP算法相比, 改进算法在多种网络拓扑结构下均能有效提高节点的定位精度。

关键词: 无线传感器网络; 节点定位; 坐标转换; 分布式; 多维标度

Advanced Distributed Multidimensional Scaling Localization Algorithm for Wireless Sensor Network

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Abstract:

An advanced distributed localization algorithm based on MDS was proposed, which attempted to improve the node localization accuracy of the classical MDS-MAP algorithm in wireless sensor network. During the course of producing local node distance matrix, a new distance estimates method from Euclidean localization algorithm is introduced. Besides, a more effective transforming technology which based on the least-squares approximation is used to replace the original one, to transform the relative coordinate system to absolute coordinate system. Experimental results show that in the same experiment environment, compared with the classical MDS-MAP algorithm, the improved algorithm is more reliable in various topology networks.

Keywords: wireless sensor network; coordinate transformation; node localization; distribution; multidimensional scaling

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