基于梯度优化的多维尺度节点定位算法

作　者：赵清华, 张坤鹏, 王华奎

单　位：太原理工大学

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摘　要：

研究了分布式多维尺度分析技术在无线传感器网络节点定位中的应用，重点分析了其定位精度和收敛性能。根据传统的梯度优化算法，引入了最速下降算法作为目标函数的无约束优化方法。该算法采用最速下降法对节点的局部目标函数进行迭代优化。实验结果表明该优化算法比基于SMACOF算法的dwMDS(G)算法在定位精度上有明显的提高, 并且算法简单，容易实现，是一种实用有效的无线传感器网络节点定位方法。

关键词：无线传感器网络；迭代优化；分布式多维尺度分析；最速下降法；定位精度

A Gradient Optimization Algorithm of Nodes Localization Based on Multidimensional Scaling in Wireless Sensor Networks

Author's Name:

Institution:

Abstract:

This paper focuses on the distributed Multi-dimensional scaling algorithms in node localization , analyzing the positioning accuracy and convergence performance . According to the traditional gradient optimization algorithm, we introduce the steepest descent algorithm, which was used to optimize the local object function. Experiments show that this method performances in terms of positioning accuracy better than dwMDS(G) algorithm which is based on SMACOF algorithm. And the algorithm is simple and easy to implement, is a practical and effective method of wireless sensor network node location.

Keywords: Wireless Sensor Networks;iterative optimization; multidimensional scaling; steepest descent algorithm; positioning accuracy

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