



随机通信半径下无线传感器网络中三维节点定位算法

作者：刘洋, 邢建平

单位：山东大学

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摘要：

在无线传感器网络三维节点定位问题中，节点通信半径是一个关键参数，通过这个参数，节点建立整个网络的连接度，以实现自身定位。大多数的定位算法中，这个参数通常被设定为一个常数，但这种假设有悖于事实，一般情况下这个参数很难控制，它受到很多因素的影响，比如检测区域中的障碍物阻隔，节点硬件设计的限制以及功率控制等。本文正是考虑到了这个特殊的问题，介绍了一种最优空间跳跃距离获取以及最优锚节点选择机制，而为了更好的模拟真实环境中的多变情况，每一个节点的通信半径都被设置为20米至90米之间的一个随机值。在最后，通过仿真结果，验证了文中提出的三维节点定位算法非常适合无线传感器网络中节点拥有随机半径的问题。

关键词：无线传感器网络，随机通信半径，最优空间跳跃距离，锚节点选择

3D Node Localization Scheme Used in Wireless Sensor Networks with Random Communication Range

Author's Name:

Institution:

Abstract:

In wireless sensor networks (WSNs), node communication range is a critical parameter for localization. By this parameter nodes can generate the whole network connectivity. In most localization algorithms, it is usually set as a fixed value for convenience. But this hypothesis is often contradictory with the actual situations. Usually the communication range of each node is difficult to control. It can be influenced by many factors, such as obstacles in the sensing fields, node hardware design, and power consumption. In this paper, the special situation is taken into account. The optimum space step distance derivation and optimum anchor selection mechanism is introduced. And in order to imitate the real environment, each node is assumed to be a random communication range between 20m and 90m in a 3D field. Finally from the simulation results, we can find the proposed scheme is well suitable for WSNs with random communication range.

Keywords: WSNs, random communication rang, optimum space step distance, anchor selection

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