

基于空间角度传递的多跳AOA三维定位算法研究与在地形建模上的应用

作者：夏明, 毛科技, 何文秀, 赵小敏, 方硕瑾, 陈庆章

单位：浙江工业大学计算机学院

基金项目：国家自然科学基金

摘要：

节点定位是无线传感器网络的关键支撑技术之一，目前三维定位算法的研究较少。本文在针对地形建模的应用场景上，将APS多跳AOA定位算法的思想移植到三维定位中，提出了基于空间角度传递的多跳AOA三维定位算法，使得能够利用一跳通信范围外的信标节点信息进行定位，并且与Delaunay三角剖分算法结合起来，应用在部署环境的地形建模。仿真实验数据显示，随着信标节点的比例、通信半径的变化，MSAT3D AOA定位误差率在7%到27%不等，相比DV-Hop降低了将近30%，保证了59%到98%的定位覆盖率，而且在保证定位覆盖率的同时具有较好的地形建模定位精度。

关键词：三维定位，无线传感器网络，角度传递，AOA，地形建模

A Localization Algorithm of Multi-hop Three Dimensional AOA with Space-based Angle Transmission and Its Application of Terrain Modeling

Author's Name:

Institution:

Abstract:

Wireless sensor node's localization is a fundamental technology in Wireless Sensor Networks. Using the idea proposed by representative algorithm--APS multi-hop AOA (Angle of Arrival), the paper proposed a new algorithm named Multi-hop Three Dimensional AOA With Space-based Angle Transmission (MSAT3D AOA). By this algorithm, target nodes can use information of anchor nodes which are more than one hop away. The paper also combined MSAT3D AOA algorithm with Delaunay triangulation algorithm for terrain modeling. The results of simulation have shown that as the ratio of beacon nodes and their communication radius changes, MSAT3D AOA's localization error rate range from 7% to 27%, that is nearly 30% lower comparing with DV-Hop. At the same time, the algorithm proposed by this paper has a good terrain modeling accuracy, range from 59% to 98%, and a good terrain modeling accuracy.

Keywords: Three dimensional localization, Wireless sensor network, Angle transmission, AOA, Terrain modeling

投稿时间：2012-02-01

[查看pdf文件](#)