

基于超声波六元阵列测距的WSN节点定位技术研究

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摘要：

超声波测距定位技术以其精度高、范围广和性能稳定等优点，在无线传感器网络的定位技术中应用广泛。为了实现较大范围的高精度定位，本文设计实现了一种基于TDOA测距技术的超声波六元阵列传感器，并采用基于测地距离的多维定标算法（geodesic distance MDS）进行无线传感器网络节点定位。在Matlab平台下与Cric ket采用的迭代式三边定位和AHLoS采用的多点定位算法进行对比仿真实验，结果表明geodesic distance MDS算法在不同网络规模和测距误差条件下均能够获得更高的定位精度和较小的定位误差。

关键词：无线传感器网络；超声波六元阵；到达时间差；多维定标；节点自定位

Research of WSN Node Localization Technology Based on

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Abstract:

For the high accuracy, wide range and stable performance, the ultrasonic positioning technology is becoming an important research point in node self-localization of wireless sensor networks. This paper presents and implements a six-array ultrasonic sensor based TDOA ranging technology, and using geodesic distance based multidimensional scaling positioning algorithm for self-localization of WSN. The Matlab simulate results show that the geodesic distance MDS algorithm can achieve higher accuracy than Trilateration and Multilateration.

Keywords: Wireless Sensor Networks, Six-element Array of Ultrasonic, Time Difference of Arrival, Multi-Dimensional Scaling, Node Self-localization

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