High-Accuracy Indoor Personnel Tracking System with a ZigBee Wireless Sensor Network

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Abstract

The fast advancement of Wireless Sensor Network (WSN) technologies has initiated different perspectives for applications from traditional wireless networks and wire networks. For example, they can be set up in indoor environments which integrate varieties of sensors with network capabilities to provide indoor environment monitoring or personnel location monitoring. ZigBee is a commonly used transmission technology of indoor positioning. However, the accuracy of ZigBee positioning is usually far from satisfactory due to the strength and interference of signals. In this paper, we strive to improve the accuracy of ZigBee positioning and implement an indoor personnel tracking system. Two methods, Neighbor Area Majority Vote Priority Correction and Environment Parameter Correction, are proposed to promote the accuracy of ZigBee positioning. The experiment results prove that our methods can largely increase accuracy of ZigBee positioning and provide useful personnel tracking technology.

Keyword：Wireless sensor networks, tracking, indoor positioning, ZigBee