Sontaya Wilaijit 2007: An Accuracy Improvement of Indoor Local Positioning System.
Master of Engineering (Computer Engineering)
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Wireless Sensor Network (WSN) is widely used in many applications (e.g., Data Acquisition, Military, Environment monitor, etc.) and nowadays WSN has small size and little power consumption. Thus this paper will use WSN as its Positioning System. This Paper presents the result of the development of a new approach in using Wireless Sensor Network and Embedded System. The major success of the development is developing the hardware for local positioning system by using Time Difference of Arrival (TDOA) method. The system uses TinyOS and Multihop Communication on energy-saving hardware which is appropriate for robot navigation, office automation and security system.

The purpose of method is measure the different TOF between Radio Frequency (Beacon) and Ultrasonic. According to the Radio Frequency flights faster than Ultrasonic thus the value of measurement is depend on distance between Object and Base station (BS). The beacon packet consists of object ID and broadcast address. The advantage of the purpose is no required to clock synchronize between object and base station (because beacon packet act as synchronization signal). As the accuracy of synchronization is not depend on number of node.

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