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An Enhanced Floor Estimation Algorithm for Indoor Wireless Localization Systems Using Confidence Interval Approach

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Abstract : Indoor wireless localization systems have played an important role to enhance context-aware services. Determining the position of mobile objects in complex indoor environments, such as those in multi-floor buildings, is very challenging problems. This paper presents an effective floor estimation algorithm, which can accurately determine the floor where mobile objects located. The proposed algorithm is based on the confidence interval of the summation of online Received Signal Strength (RSS) obtained from the IEEE 802.15.4 Wireless Sensor Networks (WSN). We compare the performance of the proposed algorithm with those of other floor estimation algorithms in literature by conducting a real implementation of WSN in our facility. The experimental results and analysis showed that the proposed floor estimation algorithm outperformed the other algorithms and provided highest percentage of floor accuracy up to 100% with 95-percent confidence interval.

Keywords : floor estimation algorithm, floor determination, multi-floor building, indoor wireless systems
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