

ENHANCED RSSI-BASED HIGH ACCURACY REAL-TIME USER LOCATION TRACKING SYSTEM FOR INDOOR AND OUTDOOR ENVIRONMENTS

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Abstract- Existing researches on location tracking focus either entirely on indoor or entirely on outdoor by using different devices and techniques. Several solutions have been proposed to adopt a single location sensing technology that fits in both situations. This paper aims to track a user position in both indoor and outdoor environments by using a single wireless device with minimal tracking error. RSSI (Received Signal Strength Indication) technique together with enhancement algorithms is proposed to cater this solution. The proposed RSSI-based tracking technique is divided into two main phases, namely the calibration of RSSI coefficients (deterministic phase) and the distance along with position estimation of user location by iterative trilateration (probabilistic phase). A low complexity RSSI smoothing algorithm is implemented to minimize the dynamic fluctuation of radio signal received from each reference node when the target node is moving. Experiment measurements are carried out to analyze the sensitivity of RSSI. The results reveal the feasibility of these algorithms in designing a more accurate real-time position monitoring system.