

In-door Localization Algorithm and Appropriate Implementation Using Wireless Sensor Networks

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Abstract : The relationship dependence between RSS and distance in an enclosed environment is an important consideration because it is a factor that can influence the reliability of any localization algorithm founded on RSS. Several algorithms effectively reduce the variance of RSS to improve localization or accuracy performance. Our proposed algorithm essentially avoids this pitfall and consequently, its high adaptability in the face of erratic radio signal. Using 3 anchors in close proximity of each other, we are able to establish that RSS can be used as reliable indicator for localization with an acceptable degree of accuracy. Inherent in this concept, is the ability for each prospective anchor to validate (guarantee) the position or the proximity of the other 2 anchors involved in the localization and vice versa. This procedure ensures that the uncertainties of radio signals due to multipath effects in enclosed environments are minimized. A major driver of this idea is the implicit topological relationship among sensors due to raw radio signal strength. The algorithm is an area based algorithm; however, it does not trade accuracy for precision (i.e the size of the returned area).

Keywords : anchor nodes, centroid algorithm, communication graph, radio signal strength

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