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Empirical Experiments for Sensors? Distance Estimation in Smart Places

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Abstract: Considerable amount of research is being conducted to realize the emerging smart places technologies. The underlying infrastructure required to build a smart place technology consists of many sensors distributed in the target area. Sensors need to communicate with each other in an efficient way; hence, it requires knowing the distance with all of its neighbors. Several techniques are used to estimate distances between nodes (sensors) using Received Signal Strength Indicator (RSSI). However, many factors may affect the calculation of the exact distance using RSSI such as interference and noise levels. In this paper, we examined the RSSI behavior by conducting real experiments aimed at developing RSSI-Distance error model. We have conducted real experiments to measure the RSSI values between different sensors in various scenarios (both indoor and outdoor). The main goal for these experiments is to better understand the nature of RSSI fluctuations and its effect on distance calculations.