An Efficient Detection Method for Unknown Wireless Devices using SDR Receivers

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Abstract— **In this paper, we describe an efficient detection method for unknown wireless devices using software defined radio (SDR) receivers, which is to estimate the position of unknown devices and their transmission power by sensing carrier frequency and measuring the received signal strengths (RSSs). RSS based positioning techniques are attractive for their low implementation complexity, but they are very sensitive to the path loss exponent in field environment. Most RSS based techniques calculate the position and transmission power of unknown devices assuming that the value of the path loss exponent is known before. However, the position estimation accuracy largely depends on the discrepancy of the path loss exponent. To improve the accuracy, the proposed method introduces a new process for the path loss exponent estimation when calculating the position and transmission power of unknown devices. The simulation results show that the proposed method has better position estimation accuracy compared with existing ones.**

***Keyword*— Position estimation, RSS, SDR, transmission power estimation, path loss exponent**

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