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| **Title:** | A Hybrid TOA-Fingerprinting Based Localization of Mobile Nodes Using UWB Signaling for Non Line-Of-Sight Conditions | | |
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| **Abstract:** |  |
| Recently, Impulse Radio Ultra Wideband (IR-UWB) signaling has become popular for providing precise location accuracy for mobile and wireless sensor node localization in the indoor environment due to its large bandwidth and high time resolution while providing ultra-high transmission capacity. However, the Non-line-of-sight (NLOS) error mitigation has considerable importance in localization of wireless nodes. In order to mitigate NLOS errors in indoor localization this paper proposes and investigates a novel approach which creates a hybrid combination of channel impulse response (CIR)-based fingerprinting (FP) positioning and an iterative Time of Arrival (TOA) real time positioning method using Ultra Wideband (UWB) signaling. Besides, to reduce the calculation complexities in FP method, this paper also introduces a unique idea for the arrangement of reference nodes (or tags) to create a fingerprinting database. The simulation results confirm that the proposed hybrid method yields better positioning accuracies and is much more robust in NLOS error mitigation than TOA only and FP only and a conventional iterative positioning method. | |