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| **Abstract:** |  |
| The existence of various geo-location applications and their accuracy requirements enhance the necessities for suitable processing techniques to solve the indoor geo-location problems. Since, Impulse Radio Ultra-Wideband (IR-UWB) signals have very short duration pulses; they can provide very accurate ranging and geo-location capability in short range indoor radio propagation environments. Our research puts emphasis on indoor geo-location using UWB signaling considering both of non line-of-sight (NLOS) and LOS radio propagation environments. In this paper, we introduce and investigate a noble approach which makes a hybrid combination of Channel Impulse Response (CIR)-based finger-printing (FP) method with polygonal arrangement of reference nodes (or tags) and an iterative-TOA based real-time geo-location method using UWB signaling for wireless ad hoc networks. The proposed hybrid approach assures significant improvement in positioning accuracy compared to TOA only, FP only and conventional iterative-TOA geo-location methods by mitigating NLOS errors effectively in the indoor environment. Besides, this hybrid approach minimizes the calculation complexity of the FP method while maintaining improved geo-location accuracy in the dense multipath propagation environment. | |