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| **Title:** | **A Hybrid Positioning Approach by UWB Radio Communication Systems 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 device localization in the indoor environment due to its large bandwidth and high time resolution while performing ultra-high capacity of transmission. Received signal's time-of-arrival (TOA) based real time ranging system is widely used for UWB positioning. However, Non-line-of-sight (NLOS) propagation can cause a large error in source localization. Hence, mitigating NLOS errors is a great challenge for a positioning system. In order to mitigate NLOS errors this paper proposes and investigated a noble approach which makes a hybrid combination of fingerprinting (FP) positioning and an iterative Time of Arrival (TOA) real time positioning method. The proposed hybrid method follows an iterative process in which the initial values are estimated from FP positioning. We show that the computational complexity of the hybrid method can be significantly reduced when more appropriate initial values are considered. Finally, in comparison with TOA only, FP only and another iterative-TOA positioning methods the proposed hybrid method yields better performance and much more robust in NLOS error mitigation with improved positioning accuracy in various channel conditions. | |