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| **Title:** | Assessing the Performance of a Hybrid Geolocation Algorithm Integrating FP and TOA Techniques across Diverse Environmental Conditions | | |
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| **Abstract:** |  |
| This paper presents a validation study of indoor geolocation accuracies using a hybrid approach that combines fingerprinting (FP) and time of arrival (TOA) techniques. The investigation focuses on three dense environments, examining the influence of furniture density and multipath components on geolocation accuracy, particularly in non-line-of-sight (NLOS) scenarios. The results indicate that geolocation performance improves in denser environments with higher furniture density due to increased multipath components. Additionally, optimizing the hybrid method with a polygon size of 50 cm and sampling rate of 80 GHz leads to further accuracy enhancements. These findings underscore the significance of furniture density and demonstrate the effectiveness of the hybrid method in addressing NLOS challenges. The research contributes to the advancement of indoor geolocation techniques and provides valuable insights for designing precise indoor positioning systems across various applications. | |