

Abstract

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Comprehensive Investigation on Principle Component Large-Scale Wi-Fi Indoor Localization

The smartphone market is rapidly spreading, coupled with several services and applications. Some of these services require the knowledge of the exact location of their handsets. The Global Positioning System (GPS) suffers from accuracy deterioration and outages in indoor environments. The Wi-Fi Fingerprinting approach has been widely used in indoor positioning systems. In this paper, Principal Component Analysis (PCA) is utilized to improve the performance and to reduce the computation complexity of the Wi-Fi indoor localization systems based on a machine learning approach. The experimental setup and performance of the proposed method were tested in real indoor environments at a large-scale environment of 960 m² to analyze the performance of different machine learning approaches. The results show that the performance of the proposed method outperforms conventional indoor localization techniques based on machine learning techniques.