

Abstract

Indoor positioning and tracking services are garnering more attention. Recently, several state-of-the-art localization techniques have been proposed that use radio maps or the sensors readily available on smartphones. This paper presents a localization system called construction of indoor floor plan and localization (CALL), which is based on a floor plan, access points (APs), and smartphone sensors. The public access points provide a number of reference points that can be used to build the floor plan automatically, and acquire the user initial position. Moreover, The APs are used to calibrate and adjust the user's position, distance, and direction in real time. Smartphone sensors are used to detect the number of steps and the direction. The proposed method is implemented on a smartphone and tested in real indoor environments. Our experiment with CALL demonstrates that using a static floor plan instead of radio map will avoid the costly database updates and searches that are usually required in other approaches due to signal attenuation. It shows that CALL outperforms the existing works in terms of accuracy and effectiveness in indoor localization.