

Seamless combination of indoor and outdoor precise positioning technology

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ABSTRACT

The LBS mass-market services require high precise and reliable positioning information seamlessly in indoor and outdoor environments. However positioning in the indoor/outdoor transition area would experience problems such as, frame coordination, poor signal reception quality and combination graceful implementation, even though multi-positioning systems are employed. This paper focuses on combination of positioning systems i.e., its design and implementation, which will provide high precise and reliable services for the LBS users. A coordinate reference frame is defined to unify the time and coordinates within the positioning systems. The core of the software is a Kalman filtering algorithm, which integrates the SBAS GNSS with the WiFi data. The hybrid system is developed and tested by the simulation and validation, which is embedded on the PDA hardware. Further system development aims to synergy of PPP and WiFi fingerprinting technology to reach the meter positioning level. Recent test results are also presented in this paper.

KEYWORDS: GNSS, WiFi positioning, Seamless indoor and outdoor positioning, Reference frame, Kalman filter