

Abstract: The positioning accuracy, stability and availability of the Global Positioning System (GPS) are not good enough for providing pedestrian-level Location-Based Services (LBS). In this talk, Inertial Measurement Units (IMU) that can be found in most smart phones are used to develop a stride-based Pedestrian Tracking System (PTS). The PTS is composed of three modules including a Stepping Module that detects the occurrence of stepping with high precision, a Stride Module that estimates the stride length of each step, and a Direction Module that calculates the direction of each step. Hence, a pedestrian trajectory can be known by traversing the stepping displacement vectors. The proposed PTS can be integrated with GPS or other positioning systems, such as an RF-based positioning system, by the Kalman filter to provide high precision pedestrian position and direction information. We further develop a prototype of Pedestrian Navigation Systems (PNS) by integrating navigation functionality into the proposed PTS. The proposed solution can be easily integrated into smart phones or Personal Digital Assistants and is feasible for both indoor and outdoor applications.