

Abstract

Trajectory is the position of the points which is passed by the moving object. Based on where it happened, trajectory can be happened in indoor or outdoor environment. While outdoor trajectory can be reconstructed by GPS technology, this technology is not sufficient to be used in indoor environment. However, there are some embedded sensors in mobile devices that can be utilized to track and reconstruct trajectory in indoor environment without utilizing GPS technology. In this minor thesis, we propose the method to reconstruct trajectory for indoor environment using embeded mobiles sensors. Sensors that can be used are accelerometer and magnetometer sensor. Because two important things in forming trajectory are the movement of the object and also the direction, accelerometer and magnetometer sensor are very suitable to meet the two things. Accelerometer is used as a pedometer, to measure the acceleration which is caused by vibrations during walking, and recognize it as a step or not, depending on the threshold installed. While the magnetometer is used as a compass, to show the direction and the angle. The value of those sensors will be recorded by the mobile device. Then, from the recorded value of number of recognized steps and the angle, they will be processed to get coordinate values, and reconstruct the coordinate values as a trajectory. The accuracy of the proposed technology reaches 84.375%. Our experiment shows that these sensors are capable in tracking and reconstructing indoor trajectories without using any GPS technologies.

Keywords: Mobile device, indoor space, trajectory, reconstruction, accelerometer, magnetometer.