

Poster

Sensing the walking velocity of a person by using mobile devices

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In an indoor space, determining a person's speed of mobility has a lot of research significance and applicability in real-world scenarios. This research has developed a mobile application to investigate how to determine a person's walking speed. The goal was to determine a person's walking speed by using the number of steps. There has been similar work to test the accelerometer sensor in detecting steps. However, the accuracy of using the steps to calculate the velocity was not studied. This application uses the accelerometer sensor in the mobile device to detect steps and then compute the velocity. The accelerometer provides information about the user's motion and acceleration, and an algorithm was developed to use that data to determine the steps. Once steps are determined, the person's speed is calculated by using the change of location within a pre-determined space and time. Therefore, accurately measuring the number of steps was vital and it was determined that the position of the mobile device in the body plays a significant role in that accuracy. Therefore, the experiment used three device positions: the pants front pocket, the right hand, and the backpack. While walking, the number of steps were manually counted and recorded. A comparison was made between the recorded number of steps to the application's measured steps. The experiment was conducted multiple times for each device position. The placement of the mobile devices in the front pants pocket gives the most accurate results, whereas the other two device positions gave reasonably accurate results. The position of the device played an important part in the research and had a significant impact on the accuracy of the results. In the future, testing can include additional device positions. Additionally, other mobile device sensors could be included in the testing and can be compared with this approach.