

# Pedestrian Trajectory Determination in Indoor Environments

Lubica Ilkovičová, Pavol Kajánek and Alojz Kopáčik (Slovakia)

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## SUMMARY

Nowadays, the topic of the navigation in indoor environment is becoming more and more current and several systems that can substitute GNSS technology are developed. In the presented paper is introduced the method of determining the trajectory of pedestrians in an indoor environment, what constitutes an undisputed the basis for navigation of persons in indoor environment of buildings. To determine the pedestrian trajectory were used data from inertial sensors (accelerometers and gyroscopes) and calculated the trajectory by “step detection” method. The paper describes the localization possibilities with usage of sensors available in smartphone. The developed method isn't able to identify the absolute position in the building, but provide the information about the relative position, in regard to planned route. During the experiment the accuracy of the trajectory calculated from the smartphone Samsung Galaxy S4 data was tested. The trajectory was determined in the ground plan of an administrative building with known location of fixed points, which are included in the path of the pedestrians. The algorithm for data processing was created in Matlab software, parallel with the algorithm for calibration of smartphone sensors. Matlab function “findpeaks“ was used for step detection and determination changes in sensor orientation. The main algorithm produces dynamic plot of the actually position of pedestrian on the building floor plan.