

## **Abstract**

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This thesis deals with the possibility of connecting inertial navigation sensors (accelerometer, magnetometer and gyroscope) to determine with the highest precision the position of the user without the help of GPS or other networks. This is inherently connected with the need to deal with many sources of errors, which are connected with this positioning method.

The research section describes the principle and history of selected navigation methods and current trends in the use of inertial positioning or navigation methods. The methodical part deals with the design of a system able to determine with the highest accuracy the current position of the user from different input conditions. It is designed to obtain the necessary data from both the sensors and the user and their subsequent processing and use to render the user's position. The application section then describes the practical procedure for creating an Android mobile OS application output and in the discussion part is presented and evaluated the knowledge of testing both during the creation and in the final survey among the test users. The conclusion evaluates the goals and summarizes the practical possibilities and limits of the usability of these positioning methods in mobile phones. It also provides suggestions for further development and exploration.

### **Keywords:**

Mobile phones, navigation, GPS, inertial navigation, Android, maps