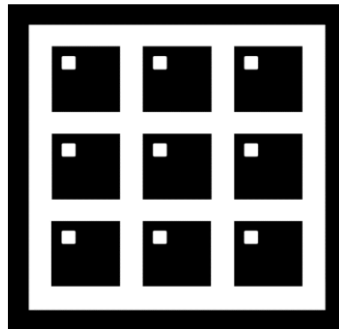


## Analysis and evaluation of the precision of an image based algorithm to detect position and orientation of a device

### *Description*

For an Android application developed at the IMD, the position and orientation of the smartphone has to be determined to evaluate the reliability and accuracy of the sensors used in the smartphone. In previous works an algorithm has been developed, that allows the smartphone to estimate its relative position and orientation change using a regular pattern of black squares on a white sheet of paper. For the evaluation of the sensors the measured relative position and orientation change has to be as precise as possible. However it is not an easy task to make sure the data from the image analysis is precise.



In this project it is your task to design and create a test to evaluate how reliable and accurate the position and orientation estimates from the image analysis are. Afterwards you would have to conduct multiple tests with different devices to evaluate the image analysis. If possible create and derive suggestion on how to improve the image analysis to create better and more accurate results.

### *The following tasks have to be conducted:*

- Familiarize with OpenCV and the used algorithm
- Design and create a test that allows to evaluate the precision of the data
- Investigate on the precision and reliability of the used algorithm
- Evaluation of the results and possible suggestions for enhancements
- Discussion and documentation of the results

### *Prerequisites:*

- Experience with Inertial Sensors and Image Analysis
- Programming skills in C/C++
- Moderate knowledge of Android and Java programming

### *Supervisor:*

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