Institute of Robotics, University of Innopolis

Sensation and Perception
Home Work 03
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1 Attention

This is valid for the each and every lab class, you can do your lab tasks with the most preferred language but these standards need to be fulfilled.

- JAVA 8
- C++ 11
- C 99
- Python 2.7.x or 3.6.x
- Matlab 17a onwards

You need to submit your source code along with a clear description of how to run your implementation.

2 Task One

To get started your homework 03, it is needed to place a 3d object such as a cube or a cylinder or something you like in an appropriate way with respect to Kinect. Then you are going to use Kinect 2 in order to get the depth map. Associate depth map with RGB information in order to isolate the object, which is to be extracted from the ground plane and other background. You may have to use RANSAC or some other algorithms to extract the object and find the center point of the object in the 3D space. It may be relative to Kinect or any known position in the world.

3 Task Two

Take your smart phone and run for at least 100 meters with a constant speed. Your task is to estimate the trajectory where you ran with your phone which may be used to get some sensor reading such as accelerometer, gyroscope, GPS sensor and so on. You should use multidimensional Kalman filter with sensor fusion to solve this task. In the report clearly explain all the assumptions you made.

4 Submit

Please upload the single zip file which includes your source code, report (valid for both tasks), dataset you collected in task 2 and video which shows the depth map acquisition from the Kinect while including what you did and why you did it in the report. You may upload your video into some file server and put the reference in the report.

5 Deadline

The deadline: November 1st, 23:59:59 GMT+3.