Homework5

System Identification and Simulation

October 25, 2017

Deadline is November 9, 2017, 23:59 (MSK)

The task is to guess position of the robot by indirect data

Requirements for result are:

- In the moodle should be just one link to your project on github.com
- Project on github.com should contains all needed sources(code), directory with data that you got from your partner and readme.md file.
- Put instruction how to run your code in readme.md
- The report of the work can be in readme.md or in separate pdf file in the repository.

1. This work is in pairs - choose a partner and write down his name. The rules how to work with lego you should know from previous homework.
2. Construct lego robot, set trajectory of moving and collect indirect data from sensors(for example odometry, or you can even add smartphone on the robot and get data from it). In the report you should describe trajectory that you choose for your robot and data that you decided to collect (for sure you should choose such data that can help to identify trajectory, and as you understand it is not enough to have just odometry to make data fusion). Pass sensors data in separate files with appropriate names. Collect at least 300 values for each sensor.
3. Give your sensors data to your partner (do not forget to give description what is the data) and get data from him (just data, not a trajectory).
4. Try to guess your partner's robot trajectory. For that firstly construct trajectory just by each sensor separately. Then try all algorithms that can be applied in your case (KF, EKF, UKF, PF) for data fusing. If it can not be applied - show why. Compare all results and describe why you got such results. Full points for the task you will get only if implement all

algorithms manually (but you can use libraries to get some points). And again try to guess trajectory.