

Laboratory Projects

The initial three phases of the project required the development and validation of classical and optimal control and deterministic estimation solutions. Then, the continuous time solutions were validated (hopefully successfully) in simulation. Now, the groups that completed all the previous phases successfully before **MAY 18TH** should embark on the demonstration of the proposed solutions, resorting to the existing resources available at ACCAII/DEM.

Phase IV

The following tasks should be accomplished in this last phase of this project:

- i) Obtain discrete time versions of the underlying models, with a careful choice of the sampling period;
- ii) Readdress the synthesis of the required control systems, now in discrete time, and validate those solutions both with the linearized and with the full nonlinear systems in simulation;
- iii) Prepare a set of tests with the sensors to be used, where the stochastic disturbances should be identified;
- iv) Readdress the estimation problems solved, now for the stochastic discrete time underlying linear systems. Note that both the model of the system and the stochastic disturbances should be taken into consideration, and Kalman filters should be designed and tuned.
- v) Go for the lab and test your solutions with the real prototypes.

Deliver no later than 6th June 2017 a written report, up to ten slides in PowerPoint to be presented in the demo day, and Matlab/Simulink (version 2014a) scripts, for the final grading.

Good luck and enjoy

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