Design of new didactic devices for teaching of control engineering

Supervising staff

Laurent Catoire (Laurent.Catoire@ulb.be), SAAS, ULB

Michel Kinnaert (Michel.Kinnaert@ulb.be), SAAS, ULB

Context

The framework of the project is the teaching of control system theory to future engineers. The goal consists in designing new modular, evolving, and open-source solutions to provide a better, more practical learning experience to the student.

A set of didactic devices is under development including a self-balancing robot, a fluid mixer,…. The aim of this project consists in modifying/designing new features involving mechanical, electrical, as well as software parts, in order to end up with a fully functional device that can be used both for teaching labs and for demos.

Key objectives:

- selection of the sensors/actuators
- design of the signal conditioning / acquisition stages
- design of the experimental setup (SolidWorks, 3D printer …)
- design of the power supply & cable management
- implementation of a control strategy (Arduino/C programming or Matlab/data-acquisition board)
- setup of some didactic experiments & their related teaching materials

Requested skills:

- quick & autonomous learner in a dynamic environment
- team player, creativity
- basic knowledge in control theory, digital signal processing, electronics