LABORATORY OF SAFE OPTIMAL PROCESS CONTROL

Description of main activities:
The research area is aimed to the design, synthesis, and implementation of optimal control systems for process control applications which require rigorous guarantees that the control system will exhibit desired safety and economical properties. The parameters of safety and economical behaviour are divided into theoretical properties (closed-loop stability, satisfaction of process constraints, economically optimal process operation), and practical properties (guaranteed execution of the optimization algorithm on platforms with restricted computational resources, correct behaviour of the control system even under failures of the communication channels). Nowadays, these properties are verified by extensive testing which is time consuming and expensive. Therefore, the main goal of the research is to develop a unified methodology which allows designing optimal control systems in which safety properties can be imposed and verified already at the design stage.

Equipment available:

- Laboratory of Process Control (distillation column, chemical reactor, heat exchangers, liquid tanks, membrane separation plant)
- Laboratory of Industrial Control (Simatic, Honeywell, BR Automation, Foxboro)

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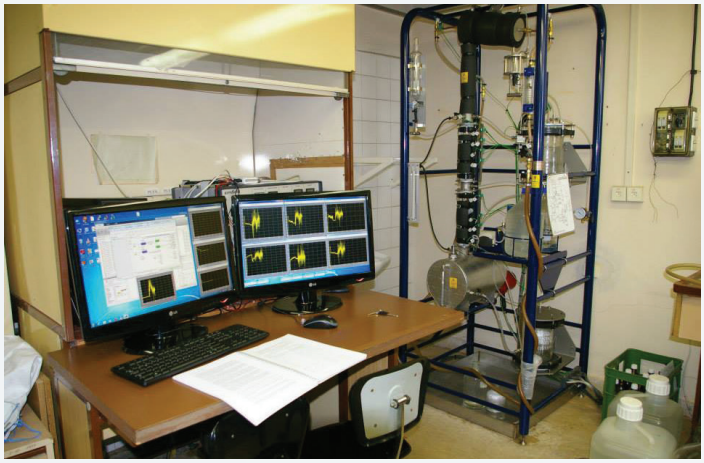
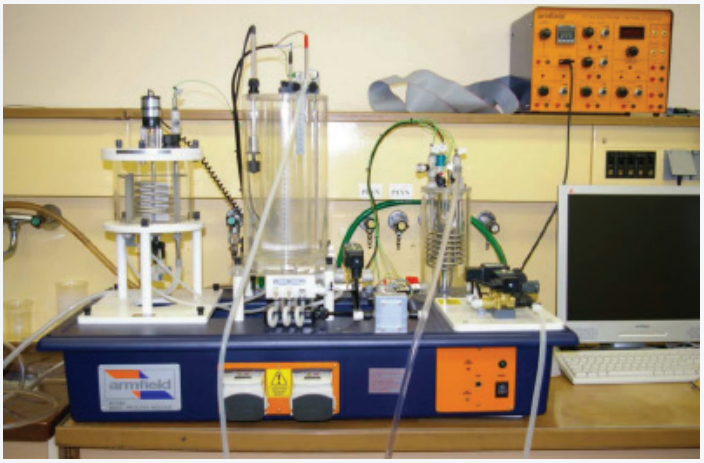
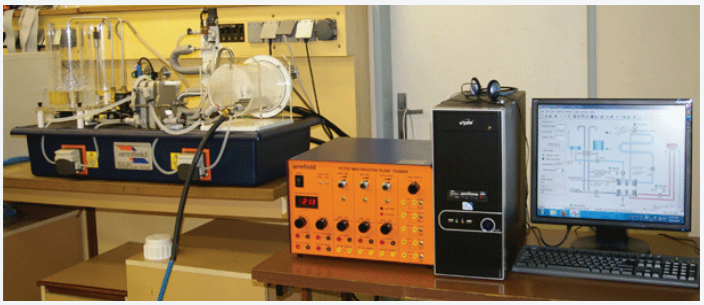


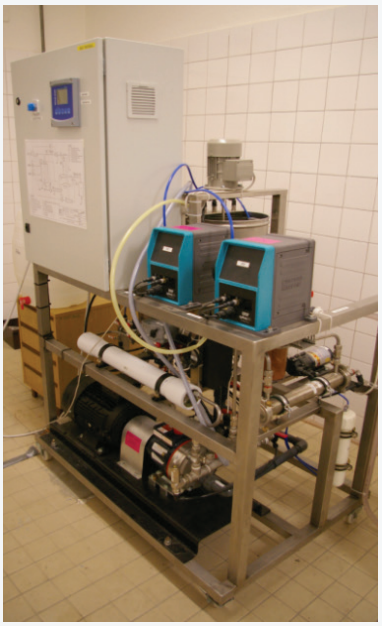
Distillation column - Armfield UOP3CC



Multifunction station Armfield PCT40



Training station Armfield PCT23



LEGO Mindstorms

Membrane separation plant