UE Embedded control and modeling labs

Level
Baccalaureate +5

ECTS
3 credits

Component
UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)

Semester
Automne

- **Teaching language(s):** English
- **Open to exchange students:** Yes
- **Code d'export Apogée:** PAX9SCAE

Presentation

Description

Embedded control & Labview (18 h)

- Become comfortable with the LabVIEW environment and data flow execution.
- LabVIEW Concepts:
  - Acquiring, saving and loading data;
  - Find and use math and complex analysis functions;
  - Work with data types, such as arrays and clusters;
  - Displaying and printing results.
- Understand the principle of Embedded systems.
- Be able to use Labview and the RT and FPGA Modules specially with Embedded systems.
- Understand data exchanges between several systems.

Modeling labs (27 h)

Feedback control design, diagnostic/supervision and process optimization typically require a specific modeling approach, which aims to capture the essential dynamics of the system while being computationally efficient. The first part of the class details the guiding principles that can be inferred from different physical domains and how multi-physics models can be obtained for complex dynamical systems while satisfying the principle of energy conservation. This leads to algebro-differential mathematical models that need to be computed with stability and computational efficiency constraints. System identification constitutes the second part

of the class, to include knowledge inferred from experimental data in the input/output map set by the model. It provides methods to evaluate the model performance, to estimate parameters, to design "sufficiently informative" experiments and to build recursive algorithms for online estimation.

Course parts

UE Embedded control and modeling labs - CM	Lectures (CM)	9h
UE Embedded control and modeling labs - TP	Practical work (TP)	36h

Period : Semester 9

Useful info

Place

Grenoble

Campus

Grenoble - Scientific Polygon