Digital Control Project

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

- **Code:** N8EE14B
- **Open to exchange students:** Yes

Presentation

Objectives

Develop digital speed control for a mechatronic system consisting of a power converter and a brushless DC motor. The system is controlled by a digital system comprising an FPGA and an SOPC processor.

Description

The aim is to encourage students to develop all the functionalities required for speed control of a brushless DC machine. The work is carried out in pairs, each pair having a model for experimental purposes.

Autopilot control is achieved using digital control logic implementing pulse width modulation developed in VHDL language and position sensors.

A speed sensor is then designed, again in VHDL, to enable the measurements required for speed control.

The students then design the entire speed control algorithm, from simulation to implementation on a processor using the C language.

Pre-requisites

- Concept of autopilot control of electrical machines
- Control of a pulse width modulation energy converter
- Sizing of a continuous regulator and its digital equivalent