Hybrid Dynamic Systems

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Ametys Code:** N9EE18D
- **Open to exchange students:** Yes

Presentation

Objectives

Analysis and control of hybrid dynamic systems

Description

The course begins by explaining the reasons for studying hybrid dynamic systems. These include the existence of physical systems combining continuous dynamics, switching and/or pulses, such as power converters or network-controlled systems. Furthermore, certain physical system control objectives cannot be achieved using conventional continuous controls.

Subsequently, methods for modelling and analysing the stability (in the Lyapunov sense) of hybrid dynamic systems are presented. Finally, several methods for synthesising hybrid controls are detailed.

Students apply hybrid control laws to a power converter as part of a design office project. The closed-loop performance is compared to that of a conventional direct control system.

Pre-requisites

N8EE13C - Non-linear control

N8EE13A - State space