

COMPUTING 1 FIELD_13 ECTS

Introducing

Description

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse

Unix

Introducing

Description

The command interpreter (the shell), variables, iterative structures, control structures,
Programming using the command language (essentially bash),
Handling the file system and, in particular, access rights,
User management (uid, gid, home directory, etc),
I/O and pipe redirection mechanisms.
Some general information on documentation, archiving, compression and a few network commands.

Objectives

At the end of this module, the student will be able to use the command interface of the Unix operating system independently.

Necessary prerequisites

No required

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Practical info

Location(s)

 Toulouse

Discrete automatics

Introducing

Description

The second part covers discrete event systems control. It includes the general structure of a sequential system and the study of elementary sequential functions (flip-flops, counters). It also addresses the synthesis and analysis of a sequential logic system. The Huffman method is introduced, as well as simplified sequencer synthesis. The realization will be done using flip-flops for synchronous systems. Additional information is provided on Huffman synthesis for asynchronous sequential logic systems (issues of hazards and races). The formalism of Petri nets is introduced for specifying problems related to parallelism, synchronization, and critical resource management, as well as the statecharts formalism.

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- Sequential logic: synthesis and analysis

The student should be capable of:

- Conducting minimal synthesis and analysis of a sequential system based on flip-flops, including that of a sequencer (synchronous systems).
- Analyzing and synthesizing complex asynchronous sequential logic systems, identifying and resolving issues related to static hazards and races.
- Modeling a system with parallelism, synchronization, and shared resources using the formalism of Petri nets or statecharts, and analyzing properties (safe, live, and sound) of a network through the marking graph.

Necessary prerequisites

Combinatory logic

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Practical info

Location(s)

 Toulouse

Continuous automatics

Introducing

Description

This course deals with the modeling, analysis and control of continuous linear systems. It presents the classical methods of frequency automata. They are based on the transfer function representation, obtained from the Laplace transform. The stability property and their temporal and frequency responses, in the form of Bode and Nyquist diagrams, are studied. We analyze the performance of a servo system, in terms of accuracy, transient regime and stability margins. Finally, the synthesis of correctors is approached by studying the effects of elementary corrections, before combining them to set PI, PID and phase lead controller.

Objectives

At the end of this module, the student should have understood and be able to explain the main concepts of the automatic control of continuous linear systems:

- model a continuous linear system in the form of transfer functions and block diagrams
- calculate the time and frequency responses of a continuous linear system, and analyze its stability
- analyze the main properties of a servo system (stability, transient regime, accuracy and stability margins)
- synthesize, using the classical frequency method, some controller (elementary corrections, PI, PID, phase lead)

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Practical info

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