



INTERNET DES OBJETS ET SYSTÈMES CONCURRENTEMBARQUÉS

INTERNET OF OBJECTS AND EMBEDDED CONCURRENT SYSTEMS

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| Lecturers : 12 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 8 | Project : 0.0 | Language : FR

Objectives

The Internet of Things is based on the continuous progress of microelectronic and network technologies that allow the deployment of distributed services on networks of interconnected communicating objects.

This module will first provide an overview of the Internet of Things, from the norms, standards and technologies on which it is based, to the applications and security issues.

In a second step, the students will be made aware of the notions of concurrent programming as well as of real-

Keywords : Internet of Things, Web of Things, connected devices, smart city, Ambient Intelligence, home automation, Bluetooth, Zigbee, 6LoWPAN, PLC, Concurrent programming, Real-time computing, Embedded computing, Mobile computing

Programme

- Context, uses and fields of application of IoT: smart cities, ambient intelligence, Big Data (2h)
- Technologies of connected objects (2h)
- Security and physical safety of connected objects (2h)
- Network aspects and identification of objects (2h)
- Notions on concurrent programming, mutual exclusion mechanisms, concurrent schemes (2h)
- Requirements of real time systems and kernels, embedded and mobile computing, robotics (2h)

Learning outcomes

- Understand the field of connected objects, their technologies and applications as well as the notions of concurrency/parallelism.
- Design an application based on the exploitation of data from distributed sensors
- Simulations of concurrent systems for handling and processing data from multiple sensors

Independent study

Objectifs : This activity is not concerned with framed autonomy activities outside personal work.

Méthodes : This activity is not concerned with framed autonomy activities outside personal work.

Core texts

N. Bouhaï et I. Saleh , *INTERNET DES OBJETS, ÉVOLUTIONS ET INNOVATIONS*, ISTE editions, 2017
M. Yaynal *CONCURRENT PROGRAMMING: ALGORITHMS, PRINCIPLES, AND FOUNDATIONS*, Springer-Verlag, 2013
A. Burns & A. Wellings *CONCURRENT AND REAL-TIME PROGRAMMING IN ADA*, Cambridge U. Press, 2007

Assessment

Final mark = 50% Knowledge + 50% Know-how
Knowledge N1 = 100% final exam
Know-how N2 = 100% continuous assessment