2SC6292 – Remote control of thermal comfort

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Department: DOMINANTE - GRANDS SYSTÈMES EN INTERACTION, DOMINANTE - SYSTÈMES COMMUNICANTS ET OBJETS CONNECTÉS
Language of instruction: ANGLAIS
Campus: CAMPUS DE RENNES
Workload (HEE): 40
On-site hours (HPE): 27,00

Description

This teaching aims to use the knowledge achieved through the courses of the ST "Energy intelligence and intelligent buildings" to design an automatic remote control system of thermal comfort in a multi-zone space therefore with different considerations and resources.

Prerequisites (in terms of CS courses)

- High energy-efficient communications
- Energy intelligence and smart buildings

Class components (lecture, labs, etc.)

- Teamwork (brainstorming)
- Harmonization of tasks and tools used:
    * Simulink for simulations
    * GNU-Radio for real transmission emulation
- Definition of needs and performance indicators
- preparation of deliverables

Grading

The final mark includes an evaluation of the individual contribution (work in subgroups and involvement) and a collective evaluation (deliverables, intermediate technical validations, final presentation). A penalty of - 2 pts is applied per half-day of absence.

Resources

- Teaching team for supervision: Romain Bourdais and Haïfa Farès.
- Software tools: MatLab and GNU-Radio for simulations
- Hardware tools: USRP modules for real transmissions to be configured using GNU-Radio.
- Lab rooms

Learning outcomes covered on the course
- Design a multi-zone thermal comfort regulation system that works remotely
- Introduction to Software Defined Radio
- Realization of the wireless communication between the building and the controller
- Considerations on the trade-off between the use of the wireless communication protocol and the quality of service of the control

Description of the skills acquired at the end of the course
Skills developed: C1.4, C4.2, C6.1 and C7.1.