Internet of Things (IoT) communication protocols

Lecturer: Fabio Patrone

Duration: 20 hours (6 credits)

PhD: Science and Technology for Electronic and Telecommunication Engineering (STIET)

Language: English

Aim: The course offers a detailed overview about the communication protocols defined ad-hoc and the ones modified to be suitable for the IoT application requirements, including details about packet formats, network architectures, and procedures and interactions among the involved communication entities. Finally, some examples of practical applications of these communication technologies will be mentioned in order to show how they are used in real scenarios.

Contents:

- Overview of the IoT communication requirements
- IoT communication protocol classification and details about each mentioned solution:
    - Very short range: RFID, NFC
    - Short range: Bluetooth
    - Medium range: Zigbee, Z-Wave
    - Long range:
        - LPWAN: Sigfox, LoRaWAN, Ingenu, IEEE 802.15.4(k, g, e), LTN
        - Cellular network-based: EC-GSM-IoT, LTE-M, NB-IoT
    - Very long range: satellite communications for IoT
- IoT Application protocols: CoAP, MQTT, AMQP, DDS, XMPP
- Examples of IoT use case scenarios

Biography: Provided by the lecturer

Exam: Oral exam. The student has to analyse a research paper assigned by the lecturer and prepare a PowerPoint presentation describing the contents of the paper with a consequent discussion and possible further questions on the topic

Lesson calendar, time schedule, and room: TBD

For all the interested students, please send me an email (f.patrone@edu.unige.it) so I collect the interests and accordingly fix the Lesson calendar and time schedule.