Ubiquitous and Secure Networks and Services

Final Project Requirements

This document describes the requirements for beginning the practical work in groups that you will have to accomplish. These requirements are very general, thus you will have to search for documentation and make assumptions whenever necessary in order to reach to a concrete system specification.

The requirements for the system are as follows:

- It has to be composed of a Wireless Sensor Network with at least one sink and an external server (the server is used to collect data from the WSN, present or store it, command motes to do tasks, …).
- Each mote of the WSN will be equipped with the following sensors that you may use the way you find convenient for your application: Temperature, light and accelerometer. It is not necessary to make use of all the three of them.
- Your system must perform the deployment of around 10 wireless sensor nodes. The deployment of more nodes in the final demonstrator will be positively considered.
- Not all the nodes will be in the same radio broadcast range. This means that for reaching the sink the routing will have to be multi-hop.
- The WSN has to offer the following services:
    - *Periodical measurements of some type.*
    - *At least one type of non-periodical alarm.*
    - *The possibility of commanding (from the server side) some motes to do some task. At least, it has to be possible to send a command to a single mote using its id.*

It is your task to specify a concrete application that complies with these requirements and start performing the analysis of requirements and specifying its functionality by means of use cases and sequence diagrams. You have to deliver a first short description of the application and its analysis of requirements and be ready for presenting them by Milestone 2.

Important information about deliverables

The final project will use a *waterfall process software engineering* approach (analysis of requirements, architectural design, detailed design, implementation and testing).

The language for modelling all of the phases will be UML (*Unified Modelling Language*). The UML diagrams that must be used for each phase are as follows:

- For modelling analysis of requirements:
  - Use cases diagrams
  - Sequence diagrams
- For modelling architectural design:
  - Diagrams by using subsystem stereotypes
  - Class diagrams if needed
  - Sequence diagrams
- For modelling detailed design:
  - Class diagrams
  - Sequence diagrams
  - Component diagrams
- For modelling implementation:
  - Class diagrams
  - Deployment diagrams
  - An implementation "*Javadoc*" document is required as annex (to upload the document and the javadoc files, make a compressed .zip file containing both files and upload that .zip file)
- For modelling testing:
  - Activity diagrams

Some practical information you have to consider

This project is done in groups. Part of your score will depend on how well the group works.

- You will be informed on the composition of each group.
- Meet with your group colleagues or find a convenient way of exchanging information and discuss about your project regularly.
- You will have to divide the workload among the group members, but remember to be aware of everybody's work because you may be asked to present or defend any part of the project independently of the workload division you have agreed on.

You will upgrade the document and upload the different versions in accordance with the milestones of the weekly schedule. The final version of this document will end up containing all the information about your project and an initial "State Of The Art" section. This initial section constitutes your research work and will also be evaluated.

Some things are not directly object of assessment but you will need to learn the basics of them in order to make the project. An example of this is to know the basics of some UML diagram types. Whenever it is convenient, the teachers will upload or point to additional bibliography to make this easier for you.