SMART GARDEN PROJECT

Pervasive System 2016 – DIAG "La Sapienza"

Stefano Coratti & Massimo Perri

ARCHITECTURE:

The Smart Garden is a system composed by many elaboration/processing nodes or station that are within a garden scenario with plants, where each plant has its own 'plant computer' and there is a unique 'master' station in the garden.

In the demo implementation a single master and three slave stations are provided. The stations create a wireless network, where each station has an address and plant stations can interact and exchange messages with the central master station. Master station transmit broadcast messages to all the slaves in the network and receive messages from the single slave stations to it.

The scope of the master station is providing timing broadcast sync messages and weather data, using readings from a number of sensors that capture the relevant environmental values (atmospheric pressure, temperature, humidity, light intensity) to the slave/plant stations.

Plant stations do synchronize with the master, receive data from it and perform each their own calculation and the intelligent decision algorithm, with as inputs the weather data received from the master and their own configuration, that depends on the kind of plants they provide water.

The general idea is that the master periodically sends a sync message with weather and configuration information to the slaves; the slaves keep receiving until they got the master sync message, extract info and use them as input to their internal watering algorithm, along with slave station specific configuration. On the base of results of the watering algorithm each slave station provide or not provide water to the associated plant and, also, calculate the right volume amount of water to use, issuing commands to a submersible water pump that pumps up the water to the plant from a tank.