STUDY AND DEVELOPMENT OF A METHODOLOGY FOR FIRMWARE UPDATE OVER-THE-AIR

A. Corradini

Abstract

Wireless Sensor Networks are widely used nowadays for different applications. The dimension of such wireless networks (i.e. the number of nodes composing the WSN) can be very large, depending on the specific task for the network or simply considering the dimension of the environment to be monitored. Thus, in case a firmware update is necessary for the specific application or considering the first firmware installation, the manual/physical update to each of the nodes may require a very large amount of time.

Therefore, this project activity is aimed at the definition of a feasible methodology, which may be employed when the process of firmware installation or update has to be applied to a large number of WSN nodes.

Reference Bibliography: Wireless Sensor Network [1]-[6].

[1] F. Viani, F. Robol, A. Polo, P. Rocca, G. Oliveri, and A. Massa, "Wireless architectures for heterogeneous sensing in smart home applications - concepts and real implementations," Proc. IEEE, vol. 101, no. 11, pp. 2381-2396, Nov. 2013.

[2] F. Viani, G. Oliveri, M. Donelli, L. Lizzi, P. Rocca, and A. Massa, "WSN-based solutions for security and surveillance," 40th European Microwave Conference 2010 (EuMC2010), Paris, France, pp. 1762-1765, Sep. 26 - Oct. 1, 2010.

[3] F. Viani, P. Rocca, G. Oliveri, and A. Massa, "Pervasive remote sensing through WSNs," 6th European Conference on Antennas Propag. (EuCAP 2012), Prague, Czech Republic, Mar. 26-30, 2012.

[4] B. Majone, F. Viani, E. Filippi, A. Bellin, A. Massa, G. Toller, F. Robol, and M. Salucci, "Wireless sensor network deployment for monitoring soil moisture dynamics at the field scale," Procedia Environmental Sciences, vol. 19, pp. 426-235, 2013.

[5] F. Viani, P. Rocca, L. Lizzi, M. Rocca, G. Benedetti, and A. Massa, "WSN-based early alert system for preventing wildlife-vehicle collisions in Alps regions," IEEE-APS Topical Conference on Antennas and Propagation in Wireless Communications (APWC'11), pp. 106-109, Torino, Italy, 12-16 Sep. 2011.

[6] F. Viani, F. Robol, M. Salucci, E. Giarola, S. De Vigili, M. Rocca, F. Boldrini, G. Benedetti, and A. Massa, "WSN-based early alert system for preventing wildlife-vehicle collisions in alps regions-From the laboratory test to the real-world implementation," 7th European Conference on Antennas and Propagation (EuCAP 2013), Gothenburg, Sweden, pp. 1913-1916, 8-12 Apr. 2013.

This report is submitted in partial fulfillment of the degree of the course "ATO".
Supervisors: Prof. Andrea Massa, Dr. Federico Viani, Dr. Fabrizio Robol.