Towards a Smart Irrigation System Based on Wireless Sensor Networks

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Abstract : Due to the evolution of technologies, the need to observe and manage hostile environments, and reduction in size, wireless sensor networks (WSNs) are becoming essential and implicated in the most fields of life. WSNs enable us to change the style of living, working and interacting with the physical environment. The agricultural sector is one of such sectors where WSNs are successfully used to get various benefits. For successful agricultural production, the irrigation system is one of the most important factors, and it plays a tactical role in the process of agriculture domain. However, it is considered as the largest consumer of freshwater. Besides, the scarcity of water, the drought, the waste of the limited available water resources are among the critical issues that touch the almost sectors, notably agricultural services. These facts are leading all governments around the world to rethink about saving water and reducing the volume of water used; this requires the development of irrigation practices in order to have a complete and independent system that is more efficient in the management of irrigation. Consequently, the selection of WSNs in irrigation system has been a benefit for developing the agriculture sector. In this work, we propose a prototype for a complete and intelligent irrigation system based on wireless sensor networks and we present and discuss the design of this prototype. This latter aims at saving water, energy and time. The proposed prototype controls water system for irrigation by monitoring the soil temperature, soil moisture and weather conditions for estimation of water requirements of each plant.

Keywords : precision irrigation, sensor, wireless sensor networks, water resources

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