A New Approach based on Wireless Sensor Network and Fuzzy Logic for Forest Fire Detection

Abstract

Undoubtedly, great environmental damage especially in forests due to wild fire expansion has been occurred lately which has for result the deterioration of the human quality of life. For this reason an urgent need for environmental protection and preservation has been raised in the last years. This paper, presents a new approach dedicated to forest fire detection and based on wireless sensor network and fuzzy logic that performs a real-time monitoring system in order to detect forest fires and avoid considerable damages. Wireless sensor networks are used in many fields and have been deployed in a variety of applications ranging from monitoring a small room to large forests. The use of wireless sensor networks in forest fire detection applications becomes an efficient approach to early detect fires in order to minimize damages and save human life. The proposed system consists of several sensor nodes having the architecture of the System-on-Chip (SoC), CC2430. Each sensor node acquires the appropriate information and sends it to the base station node connected to a personal computer. All the nodes in the monitoring area are alimented by a PV cell, collect the information of temperature, humidity and wind speed. The collected information is the input variables of the fuzzy logic of the system applied to detect forest fires. So, it will send real-time alarm messages and deliver the forest fire risk level to the monitoring authorities in order to undertake immediate actions.
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Index Terms

Computer Science

Wireless

Keywords

Forest fire ZigBee SoC CC2430 Wireless Sensor Network fuzzy logic.