

A NOVEL INTEGRATED WIRELESS SENSOR NETWORK ARCHITECTURE FOR DISASTER PREVENTION

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Abstract: There has been growing interest in the application of Wireless Sensor Networks (WSN) in the field of disaster prevention. In such applications, sensor nodes are randomly deployed in an area of interest, a large number of exactly same wireless sensor nodes form a robust mesh network to prevent damages in case of a disaster. In many applications, however, deploying sophisticated sensors on every sensor nodes is unnecessary and very costly. For example, in case of Earthquake one seismographic sensor in an area of a few square kilometers is good enough. Other nodes would then disseminate the sensed information to relevant locations. The main contribution of this work is to propose a WSN architecture and communication protocol for integrated disaster control, when heterogeneous sensor nodes collect relevant information from different locations of the entire WSN and transfer selectively to respective control locations where they could be used for proper disaster prevention. We have actually designed WSN based Disaster Prevention Power Control (DPPC) System which could successfully disseminate alarm signal, and control AC power to facilitate disaster protection. In addition, line interface technique has been developed to interface sensor nodes with physical devices.

Keywords: Wireless Sensor Network (WSN), Disaster Prevention Power Control (DPPC), Real-time Emergency Earthquake Reception System (EERS), Power Control Device (PCD), A/D (Analog to Digital) conversion