

Real-Time Monitoring and Intelligent Control for Greenhouses Based on Wireless Sensor Network

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Abstract:

The main objective of this research is to design and implement a real-time monitoring and control of several environmental parameters for group of greenhouses. Each greenhouse is considered as a node in a wireless sensor network. A single-board microcontroller-based system has been designed and implemented to monitor and control several variables and maintain desired condition in each greenhouse. A rule-based fuzzy controller has been designed to control the microclimate of each greenhouse. The proposed system enables the farmer to monitor both the internal environment of the greenhouse. Also, the farmer can send commands to turn ON or OFF certain devices in a selected greenhouse through wireless communications. Simulated and real results have been achieved to demonstrate the system performance and real-time remote monitoring and control activities.

Keywords— Greenhouse automation, Remote monitoring and control, Fuzzy control, Intelligent control, Wireless sensor network.

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