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IoT Based Greenhouse Monitoring and Controlling System

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Abstract: The increasing demand for sustainable agricultural practices has led to the development of smart technologies for efficient resource management. This paper presents an IoT-based Greenhouse Monitoring and Controlling System, designed to create an optimal environment for plant growth by automating key processes within a greenhouse. The system utilizes a network of sensors and actuators to monitor critical parameters such as temperature, humidity, soil moisture, and light intensity in real time. These sensors are connected to a central microcontroller that processes the data and triggers the necessary control actions, such as activating irrigation systems, regulating ventilation, or adjusting lighting, based on predefined thresholds .The IoT platform enables remote access and real-time data visualization through a cloudbased dashboard, allowing farmers and agronomists to monitor and control greenhouse conditions from any location. Alerts are generated when environmental conditions deviate from optimal ranges, ensuring timely intervention. The system is energy-efficient, scalable, and designed for ease of use, which promotes sustainable agricultural practices and higher crop yields

Keywords: Arduino, sensors, automation, IoT, smart greenhouse, and wireless monitoring



