BATCH NO: 12

PROJECT TITLE: SMART AGRICULTURAL MONITORING AND AUTOMATIC IRRIGATION SYSTEM BASED ON LORA

ABSTRACT:

Long Range (LoRa) technology stands as a pivotal enabler for achieving extensive, low power, and secure data transmission in the realm of Internet of Things (IoT) devices. This technology seamlessly connects sensors, machines, and devices wirelessly to cloud platforms, establishing a robust and efficient communication network. In the proposed smart agriculture system, LoRa takes center stage, serving as a foundational element for the analysis of crucial climatic parameters, namely temperature, relative humidity, and soil moisture. In this innovative system, data collected by climate monitoring sensors undergoes transmission first to the Arduino and subsequently to the cloud server through a LoRa Gateway, supporting both WiFi and Ethernet connections. The cloud platform plays a pivotal role, serving as a comprehensive hub for data storage, visualization, and analysis. Core components include sensors responsible for data collection, a LoRa gateway ensuring seamless transmission, and an actuator node dedicated to irrigation control. When climatic parameters deviate from optimal levels, the Arduino swiftly commands the irrigation motor into operation, ensuring timely adjustments to preserve crop health. The traditional agricultural landscape grapples with multifaceted challenges, from inefficient irrigation practices to a dearth of real time monitoring, resulting in water wastage and diminished yields. Existing systems relying on WiFi, Bluetooth, or 3G/4G technologies often confront limitations such as restricted range and elevated power consumption, rendering them impractical and costly for widespread adoption. The proposed LoRa based smart agriculture system emerges as a strategic solution, aiming to redress these challenges comprehensively. By prioritizing cost effective measures and providing real time monitoring capabilities, this system ensures optimized irrigation practices tailored for both mountainous and plain regions. Its implementation heralds a transformative approach, leveraging the strengths of LoRa technology to foster sustainable and efficient agricultural practices in diverse landscapes.

Keywords: Agricultural Monitoring, LoRa enabled sensors, Visualization, Real time analysis