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(57) Abstract :

The present invention relates to a water quality sensing and flood mitigation system that integrates an ESP32-based microcontroller for processing sensor inputs from a water quality sensor equipped with a TDS sensor, a temperature sensor positioned adjacent for compensation, and an ultrasonic sensor for water level detection via echo time-of-flight measurements. The system further incorporates a local alert module featuring an LCD and LED indicators, a wireless communication module for remote monitoring, and a power management subsystem with a rechargeable battery and voltage regulation circuitry. Sensor fusion algorithms operating on the ESP32 analyze conductivity, temperature, and water level data to trigger alerts when preset thresholds are surpassed, thereby enabling real-time monitoring and rapid flood risk mitigation.

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