

Development of Low-Cost Weather Station

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Abstract: *Floods are among the most devastating natural disasters, leading to significant loss of life, property damage, and disruption of daily life. The unpredictability of flood events makes real-time monitoring and early warning systems crucial for minimizing their impact. This project presents the design and development of an IoT-based flood monitoring system using the ESP8266 NodeMCU microcontroller integrated with the Blynk IoT cloud platform. The system aims to continuously monitor key environmental parameters such as river water level, rainfall intensity, and temperature and humidity to detect early signs of potential flooding. An ultrasonic sensor is employed to measure the water level of a river or water body, while a rain sensor detects precipitation. A DHT11 sensor provides real-time data on ambient temperature and humidity, contributing to a comprehensive understanding of the surrounding environmental conditions. The ESP8266 controller processes the data from all connected sensors and sends it to the Blynk IoT mobile application, where users can view live readings from remote locations. Alerts can be sent to the users' smartphones if critical thresholds are exceeded, allowing timely action. This system is designed to be low-cost, scalable, and energy-efficient, making it ideal for rural and urban deployments alike. Its real-time functionality and remote accessibility enhance the readiness and responsiveness of flood management authorities and communities. Additionally, the cloud connectivity ensures historical data logging, which can be valuable for analysis and future prediction models. By leveraging the Internet of Things, this project provides a proactive approach to disaster management, aiming to save lives, protect infrastructure, and promote environmental resilience.*

Keywords: IoT, ESP8266, Flood Monitoring, Ultrasonic Sensor, Blynk IoT, Rain Sensor, DHT11, Real-time Monitoring, Early Warning System, Environmental Monitoring

