An Internet of Things (IoT)-Based Aquascape Monitoring System for Automatic Temperature and Water Filling Monitoring

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ABSTRACT

Aquascaping is the art of arranging underwater ecosystems in aquariums, requiring consistent monitoring of water temperature and level to maintain the health and stability of aquatic life. This research aims to develop an Internet of Things (IoT)-based automatic monitoring system to monitor temperature and control water replenishment automatically. The system utilizes a DS18B20 temperature sensor and a water float switch integrated with a NodeMCU ESP8266 microcontroller. A 12V DC fan is used to lower the water temperature, while a 5V DC water pump is used to automatically refill the water when the water level is low. Both actuators are controlled via a relay module. Monitoring data is displayed in real time via the Blynk IoT platform, and notifications are sent via Telegram if the temperature exceeds 30°C. Test results show an average temperature reading error of 0.216%, and all actuators respond well. This system is effective, responsive, and suitable for small-scale indoor aquariums.

Keywords*: Aquascape, Monitoring, Temperature, Automation, IoT.*