

“DESIGN OF AN ELECTRONIC SYSTEM FOR AN ESP32-BASED FISH FEEDING DEVICE AND POND WATER CONDITION MONITORING SYSTEM”

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ABSTRACT

Fish farming is an important sector in fulfilling national food needs. However, the fish feeding process, which is still carried out manually, causes problems in terms of inaccurate feeding time and quantity, as well as the inability of farmers to monitor pond water conditions in real-time. This study aims to design an ESP32-based electronic control system capable of executing automatic feeding schedules twice a day while simultaneously monitoring pond water quality parameters including temperature, pH, and turbidity. The system uses an RTC DS3231 for scheduling, a DS18B20 sensor for temperature, a pH Kit E-201C sensor, a turbidity sensor, and an HC-SR04 ultrasonic sensor to monitor feed stock levels. Data from all sensors is transmitted in real-time to the Firebase platform and can be monitored through an Android application built with MIT App Inventor. The design results show that the system is capable of integrating all five parameters within a single internet-connected ESP32 controller, enabling farmers to monitor pond conditions remotely without being physically present at the location. This system is expected to improve the efficiency of fish farming and minimize the risk of losses due to undetected changes in water conditions.

Keywords: ESP32, automatic fish feeding, water quality monitoring, Firebase, IoT, fish farming