

ABSTRACT

The issue of predatory bird attacks, particularly by kingfishers, poses a serious challenge for fish farmers in the Mina Jaya group in Purwokerto. These attacks not only result in a loss of fish quantity but also induce stress in other fish, leading to a decline in the quality and productivity of harvests. Conventional methods such as netting and manual scaring have not yielded optimal results, especially at night when monitoring is more difficult. Therefore, a technology-based solution that operates automatically, efficiently, and with minimal direct supervision is required. This research aims to design and implement an automatic bird repellent device using the ESP32 microcontroller and a Passive Infrared Sensor (PIR). The device detects bird movements within the sensor's range and automatically activates a response in the form of ultrasonic audio signal through a speaker and visual movement from a servo motor to scare the birds away. The system is also equipped with a real-time notification feature via a Telegram application, allowing farmers to be immediately informed of bird threats. Based on test results, this device is capable of detecting bird movements up to 90% of the required range, and its repellent effectiveness reaches 70%. The device is designed to be portable, weather-resistant, and can operate 24 hours a day using a powerbank with an average system response time of 2.2 seconds.

Keywords : bird repellent, ESP32, PIR sensor, ultrasonic, Telegram