

DESIGNING AND DEVELOPING AN AUTOMATIC EGG SORTING DEVICE BASED ON WEIGHT WITH COUNTING AND CLEANING FEATURES USING IOT

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ABSTRACT

Manual egg sorting often requires significant time and labor and may result in inaccurate classification. To address these issues, this study designs and develops an automatic egg sorting device based on weight, equipped with a real-time egg counting and cleaning system integrated with the Internet of Things (IoT). The system utilizes a load cell sensor and HX711 module to measure egg weight, an ultrasonic sensor to detect egg presence, a conveyor and servo motor to guide eggs to the appropriate classification area, and a water pump and brush for automatic cleaning. An ESP32 microcontroller functions as the control center and transmits data to the MQTT Panel application. Test results show a load cell accuracy of 99.21%, and ultrasonic sensor accuracy of 99% and 98.7%, respectively. Comprehensive system testing across 15 scenarios achieved 100% success, with system responses matching expectations. All sorting and counting data are accurately displayed through the MQTT interface, supporting remote monitoring. Thus, the system effectively enhances the efficiency and automation of egg sorting processes in poultry farms.

Keywords: Egg Sorter, Load Cell, Conveyor, Ultrasonic Sensor, ESP32, IoT, MQTT Panel.