

## ABSTRACT

*An important factor in maintaining fish in an aquarium is the quality of the water in the aquarium by monitoring the condition of the aquarium. One of the most important things in keeping fish is water quality such as pH, ammonia, temperature, and doing regular water changes, fish owners are sometimes busy with other busy activities. This situation causes water quality is not well controlled. Unfortunately at this time the fish aquarium water quality system generally still relies heavily on human resources to monitor water quality which is still manual.*

*Monitor water quality and perform water changes manually. For this problem, the authors developed a simple tool in the form of a prototype monitoring and automatic water exchange in an Arduino ESP32-based aquarium connected to the MQ-135 sensor to measure ammonia gas levels in the aquarium, sensor df robot to measure the pH of the water in the aquarium, the DS18B20 sensor to measure the water temperature, and the HC-SR04 ultrasonic sensor which functions to measure the water level in the aquarium and is connected to the relay which functions as a system for changing water automatically and can be seen through the web server and applications on smartphones.*

*The results of this final project research, the accuracy level of the DS18B20 temperature sensor obtained an average difference of 1.13 (°C) and the dfrobot pH sensor obtained an average difference of 0.39, the MQ-135 sensor and the HC-SR04 ultrasonic sensor were carried out simultaneously when the ammonia level is more than 1(ppm) and after performing an automatic water change with the average ammonia level after draining 0.242(ppm).*

*Keywords: Internet Of Things (IoT), Monitoring, Controlling , Sensor ultrasonic*