

## **ABSTRACT**

*Indonesia is one of the largest ornamental fish producing countries in the world, with koi fish (Cyprinus Carpio) being one of the most popular types because of their beauty and high selling value. The health and growth of koi fish is greatly influenced by the air quality of the aquarium, especially the ideal air temperature ranging from 24°C to 27°C. Unstable temperatures can cause stress and death of the fish, as well as a decrease in the quality of the color and pattern on the koi fish's body.*

*This research focuses on developing an aquarium temperature monitoring and control system for koi fish cultivation based on the Internet of Things (IoT). This system aims to maintain ideal aquarium air temperature conditions by using a DS18B20 temperature sensor, ESP32 microcontroller, as well as heating and cooling devices (heater and chiller). Temperature data collected by sensors is sent in real-time to the Firebase monitoring platform, enabling automatic temperature monitoring and adjustments.*

*The implementation of this system is expected to increase efficiency and effectiveness in koi fish cultivation, thereby supporting optimal fish growth and health. Test results show that this system is able to maintain the aquarium air temperature in the range of 24°C to 27°C, and provides a fast response in less than one second to turn on the heater or chiller, thus ensuring the temperature of the fish aquarium is in a safe condition.*

*Keywords: Koi fish keepers, Internet of Things (IoT), DS18B20 temperature sensor, ESP32 microcontroller, temperature monitoring, temperature control, Firebase.*