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Real-Time Water Quality Monitoring and Control System for Fish Farms Based on IoT

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Abstract : Due to advancements in wireless communication, new sensor capabilities have been created. In addition to the automation industry, the Internet of Things (IoT) has been used in environmental issues and has provided the possibility of communication between different devices for data collection and exchange. Water quality depends on many factors which are essential for maintaining the minimum sustainability of water. Regarding the great dependence of fishes on the quality of the aquatic environment, water quality can directly affect their activity. Therefore, monitoring water quality is an important issue to consider, especially in the fish farming industry. The conventional method of water quality testing is to collect water samples manually and send them to a laboratory for testing and analysis. This time-consuming method is a waste of manpower and is not cost-effective. The water quality measurement system implemented in this project monitors water quality in real-time through various sensors (parameters: water temperature, water level, dissolved oxygen, humidity and ambient temperature, water turbidity, PH). The Wi-Fi module, ESP8266, transmits data collected by sensors wirelessly to ThingSpeak and the smartphone app. Also, with the help of these instantaneous data, water temperature and water level can be controlled by using a heater and a water pump, respectively. This system can have a detailed study of the pollution and condition of water resources and can provide an environment for safe fish farming.

Keywords : dissolved oxygen, IoT, monitoring, ThingSpeak, water level, water quality, WiFi module
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