**P.A.COLLEGE OF ENGINEERING AND TECHNOLOGY POLLACHI**

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**REAL-TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEM**

**TITLE**  : Smart Water-IoT Enabled Water Quality Monitoring and Control System

**DOMAIN NAME** : Internet of Things

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**Abstarct**

Water pollution is one of the biggest dangers that we are facing till today, as drinking water is becoming increasingly contaminated and polluted. The ecosystem's life cycle is impacted by the diseases, spread by the dirty water to people and animals. Early detection of water contamination allows for appropriate action to be taken and the avoidance of dangerous circumstances. Real-time monitoring of the water's quality is necessary to ensure the supply of pure water. With sensors, connectivity, and Internet of Things (IoT) technology advance, smart solutions for water pollution monitoring are becoming more and more significant. This research suggests an effective IoT-based water quality monitoring system that continuously tracks the quality parameters.Here, the IoT based river water quality monitoring system monitors the pH, temperature, oxygen content of the water by moving from place to place. While monitoring, it detects the waste present in the water and removes the waste by collecting it separately in a container.

**Introduction**

All living things require water and it is impossible to live without water. Environmental pollution has grown to be a big issue as a result of technological development and industrialization. One of the most significant types of this environmental contamination is water pollution. Water pollution occurs when harmful substances enter water sources like ponds, rivers, seas and oceans, dissolve and suspend in the water, or are dumped on the bed. Water's quality and purity will decline as a result of pollution. Due to unnecessary sources of chemicals and pollutants, ensuring pure and safer water is extremely difficult. Numerous factors can contribute to water contamination; among these are sewage from cities and the discharge of industrial waste. Pollutants that enter the water via soils, the atmosphere through rain, or groundwater systems are known as secondary causes of contamination. Typically industrial pollutants from companies and residues from modern agricultural methods are found in soils and groundwater. The pollutants of water include bacteria,viruses,fertilizers,nitrates,fecal wastes, radioactive substances and plastics. Therefore water from such resources is used for determining the quality of water.

The quality of water that we drink—whether directly or through commercially made juices—is essential to our survival. Any variation in water quality would have a negative impact on human health as well as the ecological balance of all species. The parameters of the water's chemical, biological, radiological, and biological composition are referred to as its quality.The most important aspects of water quality change depending on how it is used. For instance, maintaining aquariums' temperature, pH level, dissolved oxygen level, turbidity, and water level within a particular normal range is important to guarantee the safety of the fish kept inside. However, depending on how the water is used for industrial and domestic purposes, some water quality parameters require more frequent monitoring than others.

**Literature Survey**

[1] Sathish Pasika & Sai Teja Gandla - 'Smart water quality monitoring system with cost-effective using IoT(2020)'proposed a monitoring system that comprises of many sensors that are used to measure various quality factors, such as turbidity, pH value, water level in the tank, wetness of the surrounding environment, and water temperature. The sensors are connected to the Microcontroller Unit (MCU), and the Personal Computer then performs additional processing (PC). The data will be sent to the cloud via the Internet of Things (IoT)-based ThinkSpeak application to track the water quality being tested. Future study should focus on including additional factors for analysis, such as nitrates, electrical conductivity, dissolved oxygen in the water, and free residual chlorine.

[2] Unnikrishna Menon et al.-'Wireless sensor network for river water quality monitoring in India(2012)' proposed a method for river water qualitymonitoring based on wireless sensor networks. It enables continuous and remote monitoring of water quality indicators. The main factor influencing the water quality in this system is the pH of the water, which is continuously monitored by a wireless sensor node. The processor module, signal conditioning module, power module, and wireless communication module make up the majority of the sensor node design. The base station receives the sensed data from the pH sensor via a wireless communication module, namely a Zigbee module, following the required signal processing and signal conditioning procedures.

[3] S.Geetha & S.Gouthami -'Internet of things enabled real time water quality monitoring system(2017)' proposed a water quality monitoring system. It is an essential part of keeping the planet healthy and sustainable. This project says about the overview of smart water quality monitoring. This model has been designed using Internet of Things technology in an efficient way. It is used for water sample testing and it also analyzes the data which is uploaded through the internet. When there is a deflection in water quality parameters from the actual values, an alarm is indicated to the user.

[4] Theofanis P. Lambrou - 'A Low-Cost Sensor Network for Real-Time Monitoring and Contamination Detection in Drinking Water Distribution Systems (2014)' proposed a low cost and universal approach for monitoring water quality of drinking water distribution system. It is focused on the creation of low-cost sensor nodes that can monitor water quality in-pipe in real-time and be quickly assessed. Multiple in-pipe electrochemical and optical sensors make up the main sensor node, and attention is paid to cheap cost, light implementation, and dependable long-term operation.A sensor array is created based on chosen parameters, together with a number of microsystems for analogue signal conditioning, processing, logging, and remote data presentation. In order to assess the danger of water contamination, algorithms for combining online multisensor measurements at the local level are created.

References

[1] Pasika S., Gandla S.T.

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[2]K.A. Unnikrishna Menon;Divya P;Maneesha V. Ramesh

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[3]Geetha S., Gouthami S.

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[4]T. P. Lambrou, C. C. Anastasiou, C. G. Panayiotou and M. M. Polycarpou, "A Low-Cost Sensor Network for Real-Time Monitoring and Contamination Detection in Drinking Water Distribution Systems," in IEEE Sensors Journal, vol. 14, no. 8, pp. 2765-2772, Aug. 2014, doi: 10.1109/JSEN.2014.2316414.