

V.S.B ENGINEERING COLLEGE
Department of Information Technology
IBM NALAIYA THIRAN
LITERATURE SURVEY

TITLE: Real-Time River Water Quality Monitoring and Control System

DOMAIN NAME: Internet of Things

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ABSTRACT

Water plays most important role in human survival but, increasing population in urban areas has led to pollution of water. So, there is a necessity to check and maintain the quality of water continuously. This paper aims to design real time water quality monitoring system in IoT environment for Vrishabhavathi River of Bengaluru. Five parameters are being monitored i.e. Temperature, pH, Turbidity, Flow and Conductivity using sensors. All the sensors are interconnected to form a sensor node. The data from the sensor node is conditioned and transmitted to Arduino microcontroller. Thus, forming wireless sensor network (WSN). In microcontroller the data computation takes place and the output is displayed on LCD and opensource cloud platform.

INTRODUCTION

Water is most essential for human beings, plants and animals but with the increasing industrialization the water sources are reducing tremendously. In Bengaluru, Vrishabhavathi river water was once used as the source of water supply in addition to Cauvery reservoir. But, nowadays quality of water is being affected because of direct discharge of industrial effluents, domestic wastes into the river. This polluted water harms the environment which affects the health of

people and causes the destruction of water ecosystem and water shortage situation. Over population also contributes to water pollution. Hence it is required to maintain the quality of water. Traditional methods of checking quality involve manual collection of water samples at different locations, followed by laboratory analysis in order to check water quality. Such approaches are time consuming and are considered as inefficient, apart from this, water quality can also be monitored through microbial measurements and physiochemical measurements. Physiochemical parameters include electrical conductivity, pH, oxidation reduction potential (ORP), turbidity, temperature and flow. In this project work we have collected samples of Vrishabhavathi river from different points i.e. Nayandahalli junction, BWSSB water treatment plant, Mailasandra, and Byramangala lake point where water is used for agricultural purposes. This system is a real time monitoring system, so any changes in any of the parameters are monitored every second hence increasing the efficiency of the system. In this project all the sensors are interconnected to form a sensor node (WSN). All the data from sensor node is signal conditioned and transmitted to control unit for further computations.

LITERATURE SURVEY

The author describes [1] one of the finite resource as essential to agriculture and industry as well as basic human existence is freshwater. Water quality monitoring is an important tool in the management of freshwater resources. The traditional method of testing water quality is to assemble samples of water manually and send them to the lab for testing and analyzing. This method is time consuming, wastage of man power, and not economical. The water quality measuring system that we have implemented checks the quality of water in real time through various sensors to measure the quality of water. As a variation in the value of this parameter points towards the presence of pollutants. The Wi-Fi module in the system transfers data collected by the sensors to the microcontroller, and transfers the data to the smart phone/PC. This proposed system keeps a strict check on the pollution of the water resources and be able to ensure an environment for safe drinking water.

The author describes [2] the conventional method of testing water quality is to gather samples of water manually and send to the lab to test and analyze. This method is time consuming, wastage of man power, and not economical. The water quality measuring system that we have implemented checks the quality of water in real time through various sensors (one for each parameter: pH, conductivity, temperature) to measure the quality of water. The ZigBee module in the system transfers data collected by the sensors to the microcontroller wirelessly, and a

GSM module transfers wirelessly the data further from the microcontroller to the smart phone/PC. The system also has proximity sensors to alert the officials by sending a message to them via the GSM module in case someone tries to pollute the water body. This system can keep a strict check on the pollution of the water resources and be able to provide an environment for safe drinking water.

The author describes [3] monitoring the quality of water and its proper management is crucial for any industrial and economic application. The global shortage of water demands a sustainable solution to optimize its usage. The Internet of Things provides a robust and cost-effective solution for real-time monitoring of various parameters of water. The paper aims to implement an intelligent water quality monitoring system with the aid of IoT. The proposed system was successfully implemented to determine the turbidity, TDS, flow rate and the level of water for a given sample. The data obtained from the sensors are uploaded to the ThingSpeak dashboard for online monitoring purpose. Besides, an SMS alert is sent to the user whenever the turbidity and TDS values have crossed the threshold limit defined for good quality water

The author describes [4] the monitoring of the water standard is a complex process as it has several laboratory testing methods and time consuming. To overcome this difficulty, a real time monitoring of water goodness by using IoT has been proposed. Internet of things together with the Sensor water meters for the effectiveness, govern the quality of water. Here we are executing, system for monitoring the water goodness through different sensors -turbidity, pH, temperature, conductivity. The controller accesses the information which is monitored by the use of sensors. The accessed data are controlled by the usage of Arduino controller. By using an IoT, the information is collected and the water pollution can be enquired, by a strict mechanism. To the addition, this system states an alert to the public and concerned subdivision or unit about the water. The atmosphere can have adaptable good water.

REFERENCES

- [1] Chowdury, M. S. U., Emran, T. B., Ghosh, S., Pathak, A., Alam, M. M., Absar, N., ... & Hossain, M. S. (2019). IoT based real-time river water quality monitoring system. *Procedia Computer Science*, 155, 161-168.
- [2] Das, B., & Jain, P. C. (2017, July). Real-time water quality monitoring system using Internet of Things. In *2017 International conference on computer, communications and electronics (Comptelix)* (pp. 78-82). IEEE
- [3] Maheshwari, K., & Chakraborty, A. (2021). Water Quality Monitoring System Implemented With IoT. *International Journal*, 9(7).

[4] Sugapriyaa, T., Rakshaya, S., Ramyadevi, K., Ramya, M., & Rashmi, P. G. (2018). Smart water quality monitoring system for real time applications. *Int. J. Pure Appl. Math.*, 118(20), 1363-1369.