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An Iot Based System for Water Quality Monitoring

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ABSTRACT

Water pollution is one of the biggest fears for the green globalization. To prevent the water pollution, first we must estimate the water parameters like pH, turbidity, conductivity etc., as the variations in the values of these parameters point towards the presence of pollutants. The water quality monitoring system is designed for remote river water testing and detection of pollutants. This paper gives review about various methods of water quality monitoring systems.

Keywords : Sensors, GSM, Microcontroller, PC, Software, ZigBee, Image processing.

I. INTRODUCTION

The goal of water quality monitoring systems is to detect the types, density and trend of substances in water and evaluate the quality of the water the drastically deterioration of natural ecology and environmental pollution that more unpredictable natural and man-made calamities occurred; where, the pollution as caused by these disasters flowed into the rivers would influence the water quality. In the mean time, this kind of issue has been paid attention to, which the solution has been transformed from traditional manual monitoring into nowadays automated inspection system. There are many water quality monitoring systems available in the market now. We analysed each one of them, and made a review for those. The second part of this paper consists of three sections each section explains about one technique. First section is about autonomous water quality monitoring system, second section is about image processing technique and the third section is about smart sensors using ZigBee technology.

II. RELATED WORK

1. Autonomous water quality monitoring system

Aravinda et.al[1] have projected a paradigm system. This system was developed jointly as an element of the Autonomous Live Animal Response Monitor (ALARM) toxicity biosensor, designed to be deployed in-stream for continuous observation. The objective of their work is to develop a low cost, wireless water quality monitoring system that aids in continuous mensuration of water conditions. Their contribution during this is that the system-level integration of biosensors, sensing element signal processing and sensing element information management. Their system was designed to measure a suite of biologically relevant physiochemical parameters in fresh water. They measured temperature, intensity level, pH, electrical conduction, total dissolved solids, salinity, dissolved oxygen and redox potential. These parameters provide insights into the current status of changing water conditions and assist in identifying pollution sources.

2. Using Image processing technique

Cheng-Liang et. al[2] have defined that fish has been existing and adapting to the water ecological environment that it will sense physically when water quality changes. Thus, the fish responding behavior has been taken one of the methods in monitoring water quality in recent years. This study has successfully in building a water quality monitoring system by utilizing the image processing and fuzzy inference in auto-recognizing the gesture of fish. It was our first time in setting up the image background model by using W4 method, and then adopted deduction of background in recognizing the fish profile.
After finding the center-of-gravity position of fish profile, we can obtain the real time characteristic

information of fish in position, speed and moving track. Finally put these information the input of fuzzy inference system, via appropriate rules bank in analyzing, the output value can be obtained. In this study, Zebra fish and Common Goldfish were adopted to be the study objects by using different into water and out of water device as well as different concentration of agent in observing the fish in response.

3. Design of smart sensors using ZigBee technology

Niel et al[3] have stated that the work has been done on the design and development of a water quality monitoring system, with the objective of notifying the user of the real-time water quality parameters. The system is able to measure physiochemical parameters of water quality, such as flow, temperature, pH, conduction and also the redox potential. These physiochemical parameters are used to detect water contaminants. The sensors which are designed from first principles and implemented with signal conditioning circuits are connected to a microcontroller-based measuring node, which processes and analyses the data. In this design, ZigBee receiver and transmitter modules are used for communication between the measuring and notification node. The notification node presents the reading of the sensors and outputs an audio alert when water quality parameters reach unsafe levels. Numerous qualification tests are run to validate each aspect of the monitoring system. The sensors are shown to work within their intended accuracy ranges. The mensuration node is in a position to transmit information via ZigBee to the notification node for audio and visual display. The results demonstrate that the system is capable of reading physiochemical parameters, and can successfully process, transmit and display the readings.

III. PROPOSED SYSTEM

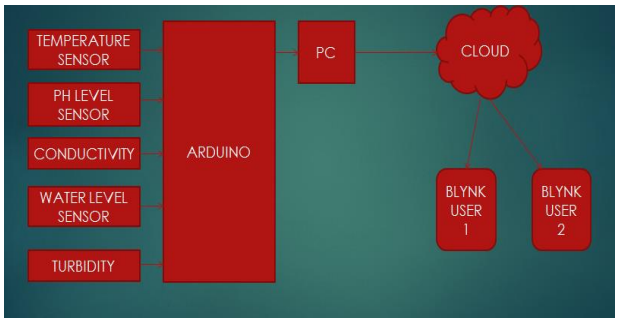

Figure 1. system architecture

We get water quality conditions through various sensors like pH level; sensor, water level sensor, turbidity, and conductivity and Arduino board. The information will be uploaded continuously from the WSN through Microcontroller and Wi-Fi. We control and upload this data to cloud and users can access this data through Blynk application by installing into their phones. Using this system a person from anywhere can monitor the information at any time.

IV. ANALYSIS

Thus, we have studied three different types of water quality monitoring system. In future, we hope to construct a more precise, efficient and economical water quality monitoring system.

V. CONCLUSION

We have seen the success of sensors in various fields; an equivalent plan has been applied to water quality monitoring systems. In this literature survey we have analysed three different water quality monitoring systems. There are lots of techniques available to do the same. All these techniques are expensive and difficult in terms of analysing and collecting the data.

VI. REFERENCES

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