

IoT Based Real Time Water Level and Contamination Monitoring System with Android Interface



^{#1}Aishwarya Bangale, ^{#2}Ruchee Dandekar, ^{#3}Perna Madke,
^{#4}U. H. Wanaskar

¹aishwaryabangale95@gmail.com,

²rucheedandekar123@gmail.com

³prnamadke12345@gmail.com,

⁴ujwalaw.267@gmail.com

^{#123}B.E. Student, PVPIT,
Pune-411021, India

ABSTRACT

Water is one of the most important substances on earth. People now days always want something that can make their life easier. In proposed system we define the dam water monitoring systems such as it will sense water level as well as pH state of water and using wireless sensor network we send that data to android application which indicate alert messages and current state of water in Dam. This will help to control flooding and water contamination monitoring. The water level monitoring with ultrasonic sensor is used to indicate the level of water in the Dam to agent. And pH Sensor Based Water Pollution Detection, it will check the water quality by using the parameter such as the pH level is measured in real time by the sensors and it will be monitoring by an agent. In this system our motivation is to prevent the flooding and water contamination by using technologies and the monitoring system uses daily life device like laptop or mobile phone.

Keywords- Internet of Things (IoT), pH, Ultrasonic, WSN Ultra Sonic, ZigBee, GPRS.

I. INTRODUCTION

A Dam is usually kept partially full, even if it has large capacity. So, when it rains heavily or there is a big snow melt-off, a large amount of water can be occupied in the dam and released slowly downstream. If the dam hadn't been there, a large amount of water could have rushed down the rivers and flooded downstream. Dams can steady the water levels of rivers and seas. When water increases to a dangerous level and is not monitored by the authorized person and then dam failure can cause potential disastrous damage to life and property. However, if the authorities always know the current status of the water level this condition can be prevented. Therefore a technology needs to be developed to implement this problem and making the system more organized. Therefore, water level indicator designing is one of the technological advancement to transmit data and received by authority for controlling. If water level increases to dangerous level, the systems also give an alert to authority to take immediate action. The system can be used at the river-banks, low-lying areas, dam

and the village far from town and also can be used for industrial sector. It is an efficient method to transmit, analyse, manage and give a feedback. The authorized person will take an immediate action to monitor the water level. So, In water dam water level checking is important task to take fine decision to prevent flooding and other natural disaster caused by it.

Similarly, high-density, industrialized aquaculture results in the deterioration of the water quality environment. The baits and substances will pollute the water environment, affect the fish growth, and even cause the mass outbreaks of disease. It is an immediate problem to establish an automatic water environment monitoring system with perfect function, stable performance. It can precisely measure and adjust the water parameters such as the pH value which helps to obtain the acidity level of water which is suitable to the growth of fish. In proposed system by making use of IoT the real time water monitoring system will be developed for measuring water level and the contamination in water.

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II. LITERATURE SURVEY

Various studies involving the implementation of water quality monitoring systems using wireless sensor network (WSN) technology can be found in literature.

In this paper an IoT based water monitoring system in real-time scenario. The system is low cost, with integrated sensory system that allows inner monitoring of water quality. Alerts and relevant data are transmitted over the Internet to a cloud server and can be received by user terminal owned by consumers. The outcome of the water measurement is displayed in web based remote dashboard.[1]

Water quality observation and measurement system is presented in this ZigBee based WSN. This system enables to real-time monitoring of the water quality parameters and remote probing and it also allow observation of historical water quality status as well as current .[2]

The water monitoring system implemented in this paper analyses and processes water quality parameters (pH, conductivity, dissolved oxygen and temperature), and also sounds an alarm when there is a water contamination, or change in water quality. The parameters are measured with off-the shelf sensors and data is sent to a base station via GPRS (general packet radio service). [3]

A WSN-based water environment system which senses and monitors video data of key areas and water parameters such as temperature, turbidity, pH, dissolved oxygen and conductivity is presented. Data is sent from the data monitoring nodes and data video base station to a remote monitoring center using ZigBee and CDMA (code division multiple access) technology.[4]

In this paper a distributed system for measuring water quality is designed and implemented. Conductivity, temperature, turbidity and pH sensors are connected to a field point, Therefore data is transfer using a GSM (global system for mobile communications) network to a land based location. The aim of this study is however using Kohonen maps (auto-associative neural networks) on the processing of the sensor data.[5]

III. PROPOSED SYSTEM

In proposed system shown in Fig. 1.1 there are three main modules Autonomous Monitoring Unit module, Control Unit Module and User Interface module. The Autonomous Monitoring Unit consists of two sub units sensing unit and microcontroller unit which is connected to wireless sensor network. The control Unit is composed of server wired or wireless network. The user Interface module consist of android phones or laptops to view the current water level status and water pH status of Dam Water will give current

statistics as well as previous history of pH values of water and changes in water level over the time.

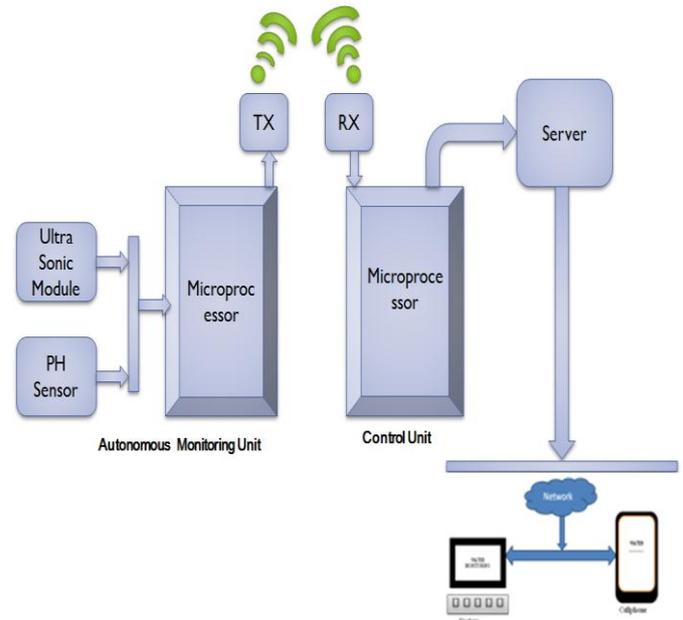


Figure 1.1 : System Architecture

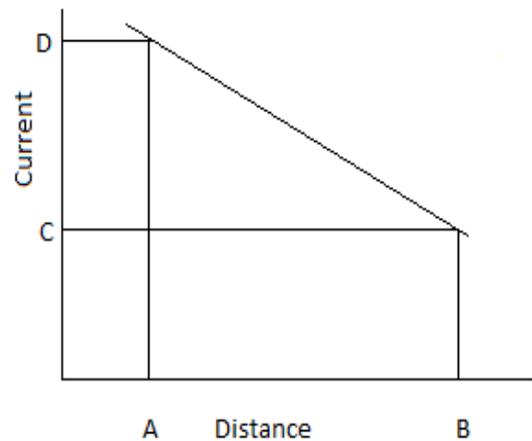


Figure 1.2 (a)

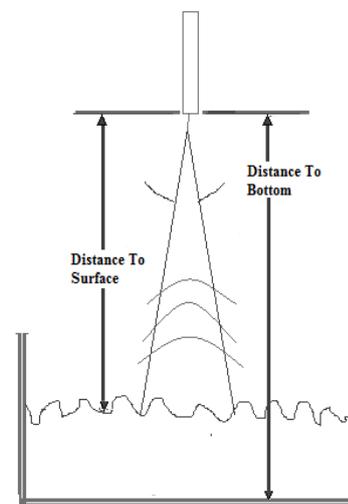


Figure 1.2 (b)

Figure 1.2 (a & b): Water Level Monitoring using Ultrasonic Sensor

The system will be generating immediate alert for sudden changes in water like rapid hike in water level or major change in pH values in android application.

It is very easy to use and definitely useful for preventing floods and other harms due to rapid changes in Dam water. Following table 1.1 shows the Comparison between Various Water level monitoring sensors.

Sr. No.	Type	MAX TEMP (°F)	Available as Non-Contact	Limitations
01	Float	500	No	Moving parts limit most designs to clean service. Only preset density floats can follow interfaces.
02	Level Gages	700	No	Glass is not allowed in some processes
03	Radiation	UL	Yes	Requires NRC license
04	Air Bubblers	UL	No	Introduces foreign substance into process; high maintenance
05	Ultrasonic	300	Yes	Presence of dust, foam, interfere with performance

Table 1.1: Comparison between Various Water level monitoring sensors

IV. CONCLUSION

Dam plays an important role in human life. It is used to steady the water level of river and seas. Dam failure can cause potential disastrous damage to life and property so effective monitoring system is needed. Proposed system will make good use of sensors and WSN with IoT and Android application for remotely monitoring of Dam water level and contamination present in water.

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