

Water Quality Monitoring System based on Sensors and online updates

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Abstract - Water is a basic necessity of life on earth. Drinking water that is unfit for consumption causes millions of diseases every year. Despite development in everything, there are still insufficient quality measures to test the quality of water. As per the above issues faced, this document ensures a cheaper water quality monitoring system by using Machine learning, which can be a better way the traditional methods. This will help people in the remote regions from various diseases caused because of consumption of unsafe water.

Key Words: — Water quality monitoring, PHP, MySQL Database, AngularJS, HTML

1. INTRODUCTION

Because of specific resources of water and such an exponential increase in population, water has become the most important resource to be concerned of today. Thereby many diseases are transmitting because of water nowadays, a cheaper and online easily available system is needed. Basically, testing the water sampled of the water from various resources is the only way to test efficiently. Few traditional methods included the use of only temperature sensors and by that they used to categorize the quality of water in the water resources. And also, there were methods that used cloud computing into the system and water they required people to be present in front to keep tracking and judging. These methods also used manual workers to keep regularly tracking the results and performing for another sample again. These methods are also very expensive and capacity is not sufficient in a country with a large population such as India and China. To remove such expenses and also have an efficient system, we need a system that helps in monitoring through the parameters such as pH value and Turbidity of water. The system also updates the result on the site. This method is based on parameter of chemical composition in the water. PH is essential for testing the quality of water because it determines the acidity of the water to be consumed. The system uses turbidity as a parameter to check if there is any kind of dirt particles present in the sample of water. The updation of the site helps in executing the process without human intervention.

1.1 Experiment and Simulation Setup

Since above work includes a lot of technologies such as PHP, MySQL database, JavaScript, CSS, machine learning, and Angular JS, a large amount of pipeline and software and software is needed. This section explains how to configure your desktop model and software.

1.2 Hardware systems

1. Arduino (NANO)

The Arduino is a great open source platform used for electronic projects. It consists of both a formal circuit board and software, or an IDE (Integrated Development Environment) running on your computer, where you can write and upload computer code to a virtual board.

2. WIFI Module (ESP8266)

The Wi-Fi chip is IEEE 802.11 b/g/n support. It can be act as wifi access point and host. It provides security features such as preauthentications, WPA/WPA2, PSK and WPS. It will transmit or receive the data from Arduino to PC or vice versa.

3. PH Sensor

This sensor calculates the pH value of the fluid through the sensor. The values of a neutral clean water will be 7 on around approx and impure water will be ranging higher or lower than those values.

4. Turbidity Sensor

The turbidity probe works by sending light concrete into the water for testing. This light will then disperse any suspended particles. The light source is positioned at a 90-degree angle to the light source, and you receive the amount of light reflected back on it.

2. METHODOLOGY

1. Machine learning

It is important to provide the perfect ph balanced and clean water because as water comes through different kind of sources. So here we use supervised machine learning technique to maintain the ph value of water in perfect balance. Model uses this machine learning technique to help us out to differentiate the drinkable water and non-drinkable water.

2. Data Source

The data holds the monthly ph records for cities around the world from Jan 1801 to May 2001. The data is extracted from Data Market. Top5 rows are included in Table below. The columns refer to the year, month and city as followed.

3. Algorithm

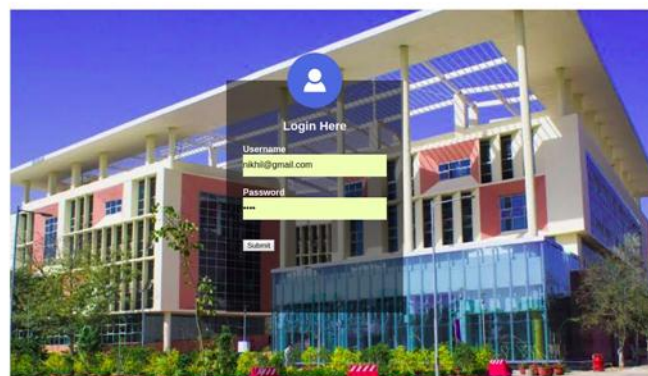
On the scale of 1-14 the ph value of the water is described. If the ph value ranges from less than 7 then it is acidic in nature and if it ranges from more than 7 then it is basic in nature. The drinkable water comes on ph scale of 7 which is neutral.

Table -1: MONTHLY AVERAGE OF MUMBAI, INDIA

| Year | Month | Mumbai |
|------|-------|--------|
| 1932 | 1 | 6.8 |
| 1932 | 2 | 7.1 |
| 1932 | 3 | 6.3 |
| 1932 | 4 | 8.7 |
| 1932 | 5 | 7.2 |

4. Analysis

Sensors were used to determine water pollution and results were generated. We have used low-cost sensors which is why the implementation cost of this program is small. In addition, algorithms are efficient and are used here to aggregate the data collected by the sensors which is why there is no data loss and the efficiency of transmission is increased.



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3. CONCLUSION

This paper presents a solution for monitoring water quality especially in remoted areas. To ensure that the problem is solved, various technologies are being used such as JavaScript, CSS, PHP, Embedded CS and machine learning are in this paper. By combining all technologies, we ensure to solve the problem faced by drinking unsafe water by humans.

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