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A Robust Encryption Method for Dicom Images Using Quaternions

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ABSTRACT:

The scarceness degradation of water resources has become a common problem. The conventional method of water quality monitoring comprises the physical collection of water sample from diverse locations. These water samples were tested in the laboratory using the laborious skills. Such methods are time consuming and no longer to be measuredeffective. Moreover, the current practices include examination of numerous kinds of parameters of water quality such as physical and chemical. The old technique of water quality detection and communication was time consuming, low precision and costly. Therefore, there is a necessity for continuous monitoring of water quality parameters in real time. By focusing on the above issues, a low cost water quality monitoring system is developed and designed that can monitor water quality in real time using IOT. In the proposed system water quality parameters are measured by the different sensors such as pH, turbidity, dissolved oxygen and temperature for communicating data onto a platform via microcontroller system i.e. Arduino model. So in order to encounter all these necessities, other skills can be used such as MQTT (Message Queuing Telemetry Transport) which permits publishing and contributing of data between the sensor and end device. In its place of using GSM network or any other technology, MQTT algorithm will be executed to make the system feasible, modular, scalar and cost-efficient

KEYWORDS: Water, Arduino, sensor,GSM

1. INTRODUCTION

Smart solutions for water quality estimationare important by using advancement in communication technology. This paper presents a detailed summary of recent works carried out in the field of smart water quality monitoring. Also, an efficient, simpler explanation for in-pipe water quality monitoring based on Internet of Things technology is developed using modern technology. The model established is used for testing water samples and the data uploaded over the Internet are examined. The system also provides an alert to a remote user, when there is nonconformity of water quality parameters from the pre-defined set of standard values.

Domestic water is planned for human ingesting for drinking and cooking purposes. The Bureau of Indian Standards (Central Ground Water Board, 2017) offersparticulars about acceptable limits of substances such as Aluminium, Ammonia, Iron, Zinc etc. Existing water quality measurement comprises manual collection of water at various locations, storing the samples in centralized location and exposing the samples to laboratory analytical testing (Thinagaran et al., 2015; Vinod&Sushama, 2016; Pandian& Mala, 2015; Azedine et al., 2000; Offiong et al., 2014). Such methods are not considered effective due to the unobtainability of real time water quality information, delayed detection of contaminants and not cost effective solution. Hence, the need for continuous online water quality monitoring in emphasized in (Vijayakumar&Ramya, 2015; Niel et al., 2016; Theofanis et al., 2014; Bhatt &Patoliya, 2016; Poonam et al., 2016; Xin et al., 2011; Xiuli et al., 2011; Sathish et al., 2016).

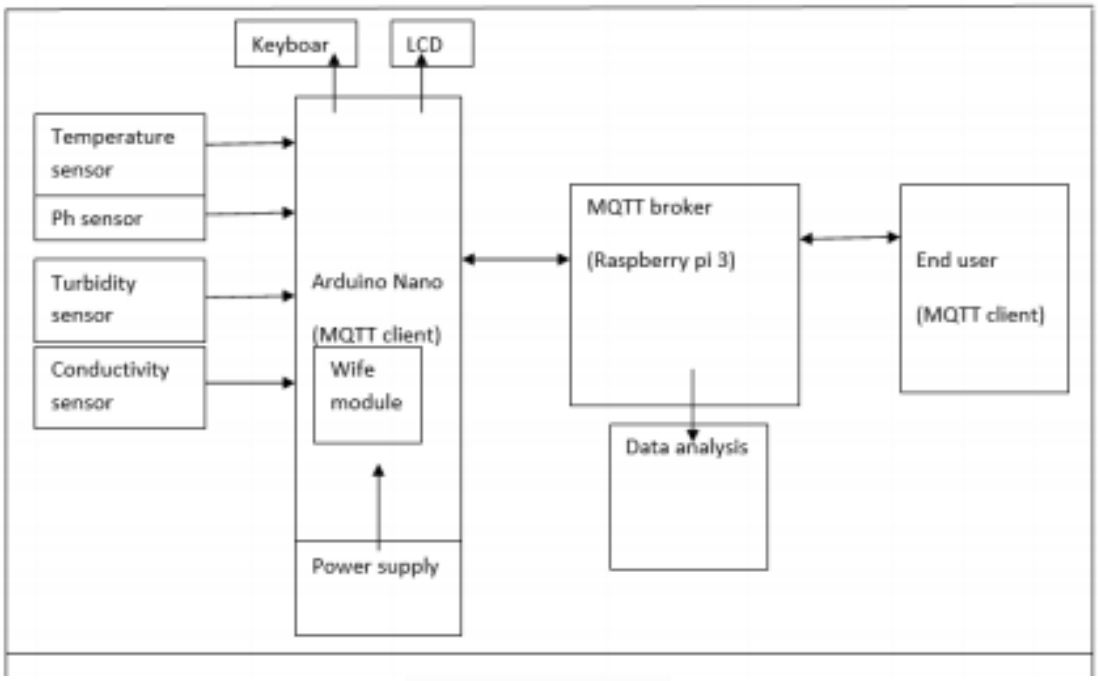

Fig 1 Block diagram

II. METHODOLOGY

The principal task is to determine which water parameters would deliver a close suggestion for water pollution. Through widespread research the strictures are selected to be collected of pH, turbidity, dissolved oxygen and temperature

The second step is the assortment of settings that will affordconvenient data. The locations were narrowed down to manufacturing areas, sewer waste openings and city lines where human interference had a significant impact. Various sensors where installed at such locations for testing.

The third step is to transmit the data from the sensors onto the arduino kit for additional processing.

The transmission of the data gained is done in the next step, from where MQTT comes in the picture. With the help of MQTT along with raspberry pi, the evidence obtained is passed onto the server and the end user.

Finally data analysis is done on the developed data set using naive bayes algorithm with the help of which the desired evidence is obtained.

Functionality of MQTT

MQTT algorithm involves of Broker, publish and subscribe.
The MQTT messages are transported asynchronously ("push") through publish subscribe construction.
The MQTT protocol works by exchanging a series of MQTT control packets in a defined way.
Each control packet has a precise purpose and every bit in the packet is carefully crafted to reduce the data transmitted over the network.
A MQTT topology has a MQTT server and a MQTT client. MQTT client and server communicate through different control packets.

III SYSTEM DESCRIPTION

Input: Sample Water

Output: pH, salinity and turbidity levels, water level,
Success Conditions: water level, salinity, Getting pH,
turbidity levels standards on Android Device Failure Conditions: Failing in transmitting the water
Audrino Microcontroller: In this project an arduino uno microcontroller is used for information gathering. This microcontroller will obtain the information from sensors. This gathered in sequence then transformed to digital form (using ADC present in microcontroller). This arduino uno micro controller is based on ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz crystal oscillator.

Specifications:
- Microcontroller ATmega328
- Input Voltage (limits) 6-20V
- Digital I/O Pins 14 (of which 6 provide PWM output)
- Analog Input Pins 6
- DC Current per I/O Pin 40 mA
- DC Current for 3.3V Pin 50 mA Operating Voltage 5V
- Input Voltage (recommended) 7-12V
- Wireless Network Processor
- IEEE 802.11 b / g
- Embedded IPv4 TCP / IP stack
- Tx Power: 11Mbps is + 18dBm, CCK
- Rx sensitivity: -86dBm, 8% packet error rate (PER), 11 Mbps
- Operating temperature range: -20 ° C to 70 ° C
- Flash Memory 32 KB
- SRAM 2 KB
- EEPROM 1 KB WiFi Shield: CC3000 is wifi shield which is compatible with arduino board. With the help of this shield data can be transmitted wirelessly. This shield is mounted over arduino board & helps in sending data to cloud or any storage system. Specifications:

This sensor is used to keep the track of water level. As the name suggests, this sensor works on the Ultrasonic sound and echo property.

observations	Ideal reading (% of water level)	Sensor reading (% of water level)
1	25	24.14
2	50	51.71
3	80	79.12

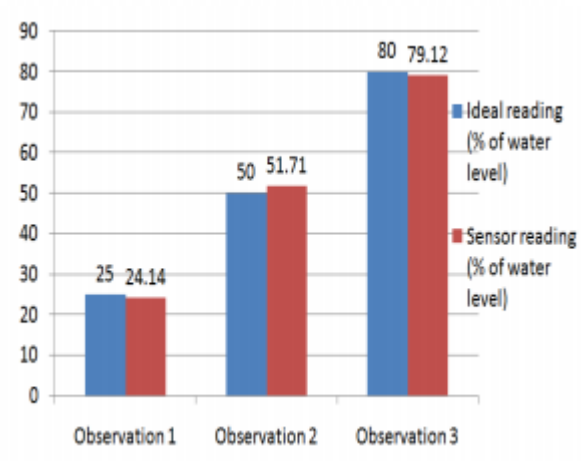

Fig2. output

CONCLUSION

The sensor has echo and trigger pins which are used to calculate the water level. Also it will take power from Arduino board by 5V pin. To start with, it is needed to provide a 10ms or higher HIGH pulse to trigger pin. Then sensor will transmit the ultrasonic wave and it will sense its echo.

REFERENCES

[1] C.C. Anastasiou T.P. Lambrou, , C.G. Panayiotou, A Nephelometric Turbidity System for Monitoring Residential Drinking Water Quality, in Sensor Networks Applications, Experimentation and Logistics, 2009

[2] C.G. Panayiotou ,T.P. Lambrou, and C.C. Anastasiou, A Low-Cost System for Real Time Monitoring and Assessment of Potable Water Quality atConsumer Sites, in IEEE Sensors 2012, 28-31 Oct 2012.

[3] S. Zhuiykov, Solid-state sensors monitoring parameters of water quality for the next generation of wireless sensor networks, Sensors and ActuatorsB: Chemical, Volume 161, Issue 1, pp 1-20, 2012

[4] A.Aisopou, I. Stoianov, N. Graham, In-pipe water quality monitoring inwater supply systems under steady and unsteady state flow conditions: Aquantitative assessment, Water Research, 46(1), pp. 235-246, 2012