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RIVER WATER MONITORING SYSTEM

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Abstract

Nowadays drinking water is the most precious and valuable for all human beings, drinking water utilities face new challenges in real-time operation. This challenge occurred because of limited water resources, growing population, ageing infrastructure etc. Hence therefore there is a need for better methodologies for monitoring water quality. Traditional methods of water quality involve the manual collection of water samples at different locations, followed by laboratory analytical techniques in order of the character of the water quality. Such approaches take longer and no longer to be considered efficient. Although the current methodologies analysis the physical, chemical and biological agents, it has several drawbacks: a) poor spatiotemporal coverage b) it is labor intensive and high cost (labor, operation; and equipment) c) the lack of real time water quality information to enable critical decisions for public health protection. Therefore, there is a need for continuous online water quality monitoring. Online water monitoring technologies have made significant progress for source water surveillance and water plant operation. The use of them technologies having high cost associated with installation and calibration of a large, distributed array of monitoring sensors. The algorithm proposed on the new technology must be suitable for particular areas and large systems are not suitable. By focusing on the above issues our paper design and develop a low-cost system for real time monitoring of the water quality in IOT environment. In us design ARM-7 is used as a core controller. The design system applies a specialized IOT module for accessing sensor data from core controller to the mobile. The sensor data can be viewed on the mobile using a special IP address. Additionally, the IOT module also provides a Wi-Fi for viewing the data on mobile.

Keywords : water, Chemical, population

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INTRODUCTION

An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints.It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming.

Embedded systems have become very important today as they control many of thecommon devices we use. Since the embedded system is dedicated to specific tasks,design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass- produced, benefiting from economies of scale.

Physically, embedded systems range from portable devices such as digital watchesand MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure.

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems — such as the operating systems and microprocessors which power them — but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected.

4A Digital computer built on a single IC is called single chip microcomputer. SuchComputers are used in instrumentation automatic industrial control, process control, and home and consumer applications. As it is used for control applications it is called micro controller or embedded microcontroller. It is very small and compact. It contains CPU, ROM, RAM and I/O lines.

NEED OF THE STUDY

It is important to monitor water quality to ensure that it is safe for humans to drinkit as well as for wildlife , and marine life. Regarding ports, it is important to measure water quality to understand environmental impacts and to not harm sea life

The presence of certain contaminants in our water can lead to health issues, including gastrointestinal illness, reproductive problems, and neurological disorders. Infants, young children, pregnant women, the elderly, and people withweakened immune systems may be especially at risk for illness.

STATEMENT OF THE PROBLEM

Due to the fast-growing urbanization, the supply of safe drinking water is a challenge for every city authority. Water can be polluted at any time.So, the water we reserved in the water tank at our roof top or basement in our society or apartment may not be safe. Still in India most of the people use simple water purifier that is not enough to get surety of pure water. Sometimes the water has dangerous particles or chemicals mixed and general-purpose water purifier cannot purify that. And it's impossible to check the quality of water manually every time. So, an automatic real-time monitoring system is required to monitor the health of the water reserved in our water tank of the society or apartment. So, itcan warn us automatically if there is any problem with the reserved water. And we can check the quality of the water anytime and from anywhere. Keeping this in mind we designed this system especially for residential areas.

OBJECTIVE OF THE STUDY

The objective of water quality monitoring is to obtain quantitative information on the physical,

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chemical, and biological characteristics of water via statistical sampling. Water quality objectives are designed forthe substances or conditions of concern in a watershed so that their attainment will protect the designated uses. Based on the discussions, the water uses to be protected should include drinking water, irrigation, primary-contact recreation, aquatic life and wildlife.

ASSUMPTIONS

1. Field Data Should Look Like Lab Data.
2. Sondes are All You Need for Monitoring Water Quality.
3. An Accuracy Specification is the Accuracy of Their Measurements in theField.

MATERIALS & METHODS

Water quality can be measured by collecting water samples for laboratory analysis or by using probes which can record data at a single point in time or logged at regular intervals over an extended period. The Department of Water uses water quality information to underpin decisions about water resource management.

1. physical characteristics– e.g., temperature, color, light, sedimentsuspended in the water.
2. Chemical characteristics – e.g., dissolved oxygen, acidity (pH), salinity,nutrients and other contaminants.
3. There are monitoring tools for servers, networks, databases, security, performance, website and internet usage, and applications and various typesof sensors.

RESULT

Water Samples	Readings		
	pH	Turbidity	Temperature
Water Sample 1	6.5	3.54NTU	18-20 C
Water Sample 2	4.4	3.9NTU	18-20 C
Water Sample 3	7.3	2.5 NTU	18-20 C

CONCLUSION

The design and development of water quality monitoring system demonstrates its capability to achieve more efficient and reliable outputs. The system is mainly focused on analyzing the water quality with 98% accuracy in real time. The observations of the indoor tests show that the output produced is almost precise and reliable. On the other hand, the outdoor test results show the system efficiencyfor a broad spectrum of water bodies. It is a versatile system, because of which simply by replacing the sensors and by making some changes within the computercode, the system can be used to measure other parameters of water as well. The system is reliable and easy to maintain, and it can be extended to measure water pollution as well. The model gave a fairly good idea of how the

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system can be implemented in several types of water bodies keeping the same design language and prospectus in mind. The proposed system is portable and handy to use and does not require any higher level of expertise in the operation. The system is most suited for water bodies and places where humans cannot approach physically.

REFERENCE

- Anand K R, Antony K A, Gipin Antony Joseph, Sabareesh Sajin, Fareeda A Kareem, "Advanced water impurity detection system", (IJIRSET) Volume 6,Special Issue 5, March 2017, ISSN (Online): 2319 –8753.
- Arjun K 1, Dr. Latha C A, Prithviraj, "Detection of water level, quality andleakage using raspberry pi with internet of things", (IRJET) Volume: 04 Issue:06, June -2017, e-ISSN: 2395 -0056.
- M. B. Kalpana, "Online monitoring ofwater quality using raspberry pi3 model B", (IJITR) Volume No.4, Issue No.6, October –November 2016, 4790-4795.
- Cho Zin Myint, Lenin Gopal and Yan Lin Aung, "Reconfigurable smart water quality monitoring system in IOTenvironment", (IEEE) 2017 IEEE/ACIS16th International Conference on Computer and Information Science (ICIS), ISBN:978-1-5090-5507-4.
- Jamil Wahid and Q.Ahsan, "Detection of impurities in water by measuringcapacitance", (IEEE) 8th International Conference on Electrical and ComputerEngineering, 20-22 December, 2014, ISBN:978-1-4799-4166-7.
- J. M. Sudhakar, Prof. K.Prahlada Rao, "An IOTbased smart water monitoring system at home", (IJTIMES) Volume 3, Issue 11, November-2017,e-ISSN: 2455-2585.
- Matthew Dunbabin , Alistair Grinham and James Udy, "An autonomoussurface vehicle for water quality monitoring", Australasian Conference on Robotics and Automation (ACRA), December 2-4, 2009, Sydney, Australia.
- S. Chandrappa, L. Dharmanna, Shyama Srivatsa Bhatta, M. Sudeeksha64Chiploonkar, M. N. Suraksha, S. Thrupthi, "Design and development of IOTdeviceto measure quality of water", I. J. Modern Education and Computer Science, 2017, 4, 50-56.
- Dr. B. B. M. Krishna Kanth, "An effective water quality and level monitoring system using wireless sensors through iot environment." InternationalJournal of Engineering Research andApplications (IJERA), vol. 7, no. 9, 2017, pp. 40–44.
- Brinda Das, P. C. Jain, "Real-time water quality monitoring system usingInternet of Things", 2017 International Conference on Computer, Communications and Electronics (Comptelix) Manipal University Jaipur, Malaviya National Institute of Technology Jaipur & IRISWORLD, July 01-02,2017.
- Vaishnavi V. Daigavane and Dr. M. A Gaikwad, "Water qualitymonitoring system based on IOT", Advances in Wireless and Mobile Communications, Volume 10, Number 5 (2017), pp. 1107-1116, ISSN 0973-6972.

DOI: https://doi-ds.org/doilink/06.2023-25698483/UIJIR

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www.uijir.com

- John Mashford, Dhammika De Silva, Donavan Marney and Stewart Burn“An approach to leak detection in pipe networks using analysis of monitored pressure values by support vector machine”, Commonwealth Scientific and Industrial Research Organisation, PO Box 56, Highett, Vic. 3190, Australia.
- A. Fredrick Romanus Ishengoma, “A Novel Design of IEEE 802.15.4 andSolar Based Autonomous Water Quality Monitoring Prototype using ECHERP”,International journal of Computer Science & NetworkSolutions, January 2014,Volume 2, ISSN: 2345-3397.

DOI: https://doi-ds.org/doilink/06.2023-25698483/UIJIR