LITERATURE SURVEY

Real-Time River Water Quality Monitoring And Control System

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1. Water Quality Monitoring Using Wireless Sensor Networks: Current Trends and Future Research Directions

Author : Kofi Sarpong Adu-Manu, Cristiano Tapparello, Wendi Heinzelman, Ferdinand Apietu Katsriku, and JamalDeen Abdulai.

Water is essential for human survival. Although approximately 71% of the world is covered in water, only 2.5% of this is fresh water; hence, fresh water is a valuable resource that must be carefully monitored and maintained. In developing countries, 80% of people are without access to potable water. Cholera is still reported in more than 50 countries. In Africa, 75% of the drinking water comes from underground sources, which makes water monitoring an issue of key concern, as water monitoring can be used to track water quality
changes over time, identify existing or emerging problems, and design effective intervention programs to
remedy water pollution. It is important to have detailed knowledge of potable water quality to enable proper
treatment and also prevent contamination. In this article, we review methods for water quality monitoring
(WQM) from traditional manual methods to more technologically advanced methods employing wireless
sensor networks (WSNs) for in situ WQM. In particular, we highlight recent developments in the sensor
devices, data acquisition procedures, communication and network architectures, and power management
schemes to maintain a long-lived operational WQM system. Finally, we discuss open issues that need to be
addressed to further advance automatic WQM using WSNs.

2. Sensor based water quality monitoring system

Author : Paul, Bishwajit.

Year : 2018.

Link : http://dspace.bracu.ac.bd/xmlui/handle/10361/10840

According to Human Rights Watch, twenty million people in our country are still drinking water contaminated with arsenic. The World health Organization (WHO) has also stated this crisis as "the largest mass poisoning of a population in history". To reduce the water related diseases and prevent water population, we have to measure water parameters such as ph, turbidity, conductivity, temperature etc. Traditional methodology of water monitoring requires collecting data from various sources manually. Afterwards samples will be sending to laboratory for testing and analyzing. In order to save time consumption and decrease manual effort my testing equipment's will be placed in any water source. As a result, this model can detect pollution remotely and take necessary actions. The main goal of this paper to build a Sensor-based Water Quality Monitoring System. Arduino Mega 2560 act as a base station and data from sensor nodes will be send to it. For the academic purpose, this paper presents a small prototype of sensor networks consisting of temperature, water level, flow and ph. Then ph. and temperature sensor values were sent cloud platform (ARTIK cloud) and displayed as a graphical representation on a local PC. Moreover, GSM shield (SIM808) is connected to Arduino Mega which compares sensor values to threshold values and sends a text alert to the agent if the obtained value is above or below the threshold value. The results of this project are discussed in the result section of the paper. We tested three water samples from three different water sources (such as industrial water, tap water and swimming pool water). Three water samples collected from three different swimming pools.(Except one sample) Ph value found in rest of the samples were in normal range (temperature value between 26-27'C). Result section (in page 20) explains our project findings in details.

3. Real-time water quality monitoring using Internet of Things in SCADA

Author : K. Saravanan, E. Anusuya, Raghvendra Kumar & Le Hoang So

Year : 2018.

Link : https://link.springer.com/article/10.1007/s10661-018-6914-x

Water pollution is the root cause for many diseases in the world. It is necessary to measure water quality using sensors for prevention of water pollution. However, the related works remain the problems of communication, mobility, scalability, and accuracy. In this paper, we propose a new Supervisory Control and Data Acquisition (SCADA) system that integrates with the Internet of Things (IoT) technology for real-time water quality monitoring. It aims to determine the contamination of water, leakage in pipeline, and also automatic measure of parameters (such as temperature sensor, flow sensor, color sensor) in real time using Arduino at mega 368 using Global System for Mobile Communication (GSM) module. The system is applied in the Tirunelveli Corporation (Metro city of Tamil Nādu state, India) for automatic capturing of sensor data (pressure, pH, level, and energy sensors). SCADA system is fine-tuned with additional sensors and reduced cost. The results show that the proposed system outperforms the existing ones and produces better results. SCADA captures the real-time accurate sensor values of flow, temperature, and color and turbidity through the GSM communication.

4. IoT Based Real-time River Water Quality Monitoring System

Author : Mohammad Salah Uddin Chowdhury, Talha Bin Emran, Subhashish Ghosh.

Year : 2019.

Link :
https://www.sciencedirect.com/science/article/pii/S1877050919309391

Current water quality monitoring system is a manual system with a monotonous process and is very time-consuming. This paper proposes a sensor-based water quality monitoring system. The main components of Wireless Sensor Network (WSN) include a microcontroller for processing the system, communication system for inter and intra node communication and several sensors. Real-time data access can be done by using remote monitoring and Internet of Things (IoT) technology. Data collected at the apart site can be displayed in a visual format on a server PC with the help of Spark streaming analysis through Spark MLlib, Deep learning neural network models, Belief Rule Based (BRB) system and is also compared with standard values. If the acquired value is above the threshold value automated warning SMS alert will be sent to the agent. The uniqueness of our proposed paper is to obtain the water monitoring system with high frequency, high mobility, and low powered. Therefore, our proposed system will immensely help Bangladeshi populations to become conscious against contaminated water as well as to stop polluting the water.

5. Real-time water quality monitoring using Internet of Things

Author : Mayuri Malunjkar, Sadhana Mare, Monika Nagawade.

Year : 2019.

Link :
https://ijariie.com/AdminUploadPdf/Real_time_water_quality_monitoring_system_using__machine_learning_and_IoT_ijariie9812.pdf

There is need for effective monitoring, evaluation and control of water quality in different areas. Ensuring safe water supply of drinking water is big challenge for today's generation. The excessive use of fertilizers in farms and also in other sectors such as mining and construction have contributed in overall reduction of water quality. To ensure the safe supply of the drinking water the quality needs to be monitor. So, we can give a design and development of a low-cost system for real time monitoring of the water quality using IoT(Internet of Things) and

machine learning. The system include of different sensors is used for measuring physical and chemical parameters of the water.