LITERATURE SURVEY

Review of Water Quality Monitoring using Internet of Things (IoT) Mr. A. P. Roger Rozario, R. Surya, Environmental Science, Computer Science, 2022.

Abstract**:-** Water pollution is one of the biggest and serious threats to society. Water has a significant impact on human health. The quality of the water must be monitored in real-time to ensure its safety and supply. Monitoring water in traditional ways takes longer, which can take up to from 24 to 96 hours to identify contaminants in water supplies, which are more time taking. This project aims at developing a water quality monitoring system using sensors and IoT (Internet of Things). The water quality parameters like temperature, pH, and turbidity are measures using sensors and the water quality index is determined. The measured values from the sensors will be processed using a microcontroller, and alert message will be sent to the user via an android application developed using MIT app inventor in case of any abnormalities. The sensor data can be viewed on the ThingSpeak GUI platform for monitoring and correction of the critical water quality parameters. The sensed data will be stored in the cloud or local storage and a machine learning algorithm will be implemented using the sensed parameters to predict the short term and long-term water quality in phase two of the project. The can are these physicochemical parameters. The sensors are connected to a microcontroller-based measuring node that processes and analyses the data, which is designed from the ground up and implemented with signal conditioning circuits. For communication between the measuring and notification nodes, ZigBee receiver and transmitter modules are used in this design. When the water quality parameters reach unsafe levels, the notification node displays the sensor readings and generates an audio alert. The sensors are shown to work within the accuracy ranges that they were designed for. The measurement node can send data to the notification node via ZigBee for audio and visual display. The findings show that the system is capable of reading physiochemical parameters and processing, transmitting, and displaying the data. water quality monitoring system based on low-power is In three regions of the six sensor nodes for water quality monitoring in pisciculture have been installed. The sensor node is a piece of modular hardware that includes control, communication, and sensor module for measuring pH, conductivity, and temperature. All data is managed by a software platform built with opensource tools, which allows for the control of water pollution and its impact on pisciculture.

Water quality monitoring system based on Internet of Things Chengcheng Zhang, Jian Wu, Jiancheng Liu, Environmental Science, 2020 3rd International Conference on Electron Device and Mechanical Engineering (ICEDME), 2020

Abstract:- Aiming at the problems of the current water quality detection system, a new type of real-time online water quality monitoring system solution based on the Internet of Things is proposed. This solution integrates the design of STM32 singlechip microcomputer, sensors, WiFi wireless transmission and remote water quality management. The system uses sensors to monitor water quality turbidity, pH value, temperature and other parameters, and uploads the

data to the management center through wireless communication. According to the analysis results, the water environment quality was measured, and water quality problems were pre-warned to prevent further spread of pollution, improve the scientificity and efficiency of water quality monitoring and management, and provide relevant departments with response strategies and management measures. This system has good real-time performance and strong practicability, and can be promoted and used in the future to promote the development of water environment monitoring.

Study of IoT Based Smart Water Quality Monitoring System
S. Srivastava, Environmental Science, International Journal for Research in Applied Science and Engineering Technology, 2021

Abstract:-IoT based water quality parameter monitoring system is a significant interest in the field of cost-effective smart water quality monitoring systems. As we know that the population growth of your country is high in last few decades. In India, the demand for freshwater for drinking purposes, agriculture, and other activities is much higher than compared to other countries. The requirement of a smart water quality parameter monitoring system is necessary to reduce the time required in the traditional approach of water quality monitoring, and for real time monitoring. This literature survey work has been conducted in the field of smart water quality parameter monitoring systems. Sensor-based smart water quality parameter monitoring in past some research carried out which is deployed in the water.

Towards real time monitoring of water quality in river basins.
F. Ungureanu, R. Lupu, +2 authors C. Teodosiu, Published 2010, Computer Science, Environmental Engineering and Management Journal

Abstract:- The remote monitoring of river water quality plays an important role in the integrated water resources management. Among the most inconvenient features encountered in the development of a real time system for monitoring river water quality, there are: variability and uncertainty in river basins, the nonlinearity of the ecological systems, the problems of high costs and low reliability caused by online sensors deployment. A global monitoring system of a hydrologic basin has a distributed (in space and functionally) and hierarchical architecture involving different mobile or static devices, various types of communication, software applications, data base and friendly interfaces with the users. This paper presents a reliable solution for a real time monitoring system for a river basin, involving multiparameters measurement instruments with local data acquisition and processing embedded devices, wireless communication system and a central server for information management. Energy constraint, routing protocols, memory restriction, data accuracy, sensor localization and not at least the cost minimization were the most challenging goals of this research. Taking into account that in the next steps of the water resources management system development, all data should be integrated and visualized by using a Geographical Information System (GIS), the generated database was a special task of this work. The design hardware and software were tested and validated in laboratory and real deployment environment.

Water Monitoring System Embedded with Internet of Things (IoT) Device: A Review

N. S. Kamaruidzaman, Siti Nazahiyah Rahmat, Computer Science, IOP Conference Series: Earth and Environmental Science, 2020

Abstract:- Urbanisation and population growth lead to increased water demand and might affect the water sources. Hence, it is important to manage it effectively. This paper reviews the use of Internet of Things (IoT) device in monitoring water system to conserve and manage the precious resources. The IoT technology is most synonymous with the latest wireless system for data acquisition for real-time monitoring surveillances. The real-time monitoring process involves large distribution of monitoring sensor and network such as computing, wireless sensor network and cloud computing. Traditionally, water quantity and quality reading has been labour intensive and subsequently an expensive process. By application of IoT, human involvement shall be minimized and most procedural decisions in a normal process will be made by algorithms. Developing user-friendly IoT tools will be an excellent contender in real time water monitoring solutions and lead to efficient management.

Monitoring of groundwater quality in some vulnerable areas in botosani county for nitrates and nitrites based pollutants

V. Vasilache, C. Filote, +4 authors C. Maxim, Environmental Science, 2012

Abstract:- This paper emphasizes a groundwater quality assessment using thirty-seven hydro-geological drillings, located in vulnerable and non-vulnerable areas in Botosani County as regarding nitrate and nitrites based pollutants and also phosphates and ammonium, during 2001-2008. The groundwater quality from vulnerable areas is within allowed limits. It was observed a decrease of nitrates and nitrites concentration in four locations designated as vulnerable zones regarding nitrates. In non-vulnerable areas, the groundwater quality deteriorated between 2006-2008, in terms of ammonium, nitrites and nitrates content. In some hydro-geological drillings, like Sadoveni and Stefanesti, the nitrites concentration (1.54 mg/L, 1.37 mg/L respectively) exceeded the legal accepted limit. The ammonium concentration in non-vulnerable areas also exceeded the limit of 0.5 mg/L. By token of the results of this monitoring activity the risk of groundwater pollution with nitrates was reassessed. MMDD Order 1552/743/2008 approved a new list of localities where sources of nitrates exist from agricultural activities; in Botosani County seventy-seven new localities were designated as vulnerable areas regarding nitrates pollutants.

Water quality monitoring using wireless sensor networks: Current trends and future research directions

KS Adu-Manu, C Tapparello, W Heinzelman… - ACM Transactions on …, 2017 - dl.acm.org

Abstract:- 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.

Sensor based water quality monitoring system
B Paul - 2018 - dspace.bracu.ac.bd

Abstract:- 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 them.

The real time monitoring of water quality in IoT environment
N. Vijayakumar, R. Ramya, Computer Science, 2015 International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS), 2015

Abstract:-In order to ensure the safe supply of the drinking water the quality needs to be monitor in real time. In this paper we present a design and development of a low cost system for real time monitoring of the water quality in IOT(internet of things). The system consist of several sensors is used to measuring physical and chemical parameters of the water. The parameters such as temperature, PH, turbidity, conductivity, dissolved oxygen of the water can be measured. The measured values from the sensors can be processed by the core controller. The raspberry PI B+ model can be used as a core controller. Finally, the sensor data can be viewed on internet using cloud computing.

The use of artificial neural networks for the prediction of water quality parameters
HR Maier, GC Dandy - Water resources research, 1996 - Wiley Online Library

Abstract;- This paper presents the use of artificial neural networks (ANNs) as a viable means of forecasting water quality parameters. A review of ANNs is given, and a case study is presented in which ANN methods are used to forecast salinity in the River Murray at Murray Bridge (South Australia) 14 days in advance. It is estimated that high salinity levels in the Murray cause $ US 22 million damage per year to water users in Adelaide. Previous studies have shown that the average salinity of the water supplied to Adelaide could be reduced.