JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

WATER QUALITY PREDICTION FOR SMART MARICULTURE

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Abstract: Water is one of the major compounds that profoundly influence ecosystem. But, nowadays it is been exploited heavily due to rapid industrialization, human waste and random use of pesticides and chemical fertilizers in agriculture, which leads to water contamination. Thus, a water monitoring system is necessary to observe the water quality in a large area such as lake, river, and aquaculture. As per the current world situation, Internet of Things (IoT) and remote sensing techniques are used in heterogeneous areas of research for supervising, congregate and analyzing data from the remote locations. In this paper, the suggested system is a minimal price real time water quality monitoring system in IoT environment. This system comprise of numerous sensors for assessing the physical and chemical parameter. The factors of water that can be assessed using these sensors are pH, turbidity, conductivity, dissolved oxygen. Using this system the real time quality of water bodies can be determined and the data uploaded over the Internet are analyzed.

Keywords : water monitoring system, Iot (Internet of things), Remote monitoring technique, Remote monitoring Sensors, pH, Turbidity, Conductivity Dissolved oxygen, Data Analysis.

I. INTRODUCTION

Water is one of the major compounds that profoundly influence ecosystem. But, nowadays it is been exploited heavily due to rapid industrialization, human waste and random use of pesticides and chemical fertilizers in agriculture, which leads to water contamination. Thus, a water monitoring system is necessary to observe the water quality in a large area such as lake, river, and aquaculture. As per the current world situation, Internet of Things (IoT) and remote sensing techniques are used in heterogeneous areas of research for supervising, congregate and analyzing data from the remote locations. In this paper, the suggested system is a minimal price real time water quality monitoring system in IoT environment. This system comprise of numerous sensors for assessing the physical and chemical parameter. The factors of water that can be assessed using these sensors are pH, turbidity, conductivity, dissolved oxygen. India is facing a major issue of natural resource exiguity, especially in case of water due to population growth and economic development Most of the water bodies are contaminated due to the superfluous pollutants, which are mostly human-made. Thus certify the cleanliness of water is a major challenge. Rapid industrialization and greater emphasis on agriculture growth with latest technology, usage of more fertilizers and pesticides caused large impurity in aquatic surroundings directing to debasement of water quality and depletion of aquatic life. Water bodies are contaminated due to point and non-point sources of pollution, which include sewage discharge, discharge from industries, run-off from agricultural fields, urban run-off and even due to floods, droughts and lack of education and awareness amid users The tonicity of lakes, rivers and other water bodies and their biological diversification are directly linked with the health of nearly every element of the ecosystem. The framework additionally gives a constant examination of the gathered information and recommends reasonable medicinal measures to slacken the water pollution. The aim of this paper is to deliver survey of functions held in smart water quality monitoring system with respect to application, communication technology used, sensors used etc. and to portrayal minimal price periodic smart water quality monitoring system using a arduino microcontroller with Wi-Fi module to examine parameters like pH, turbidity, temperature, water level, conductivity.

II. LITERATURE REVIEW

1.JUNTAO LIU, CHUANG YU ZHUHUA HU(2020) Accurate Prediction Scheme of Water Quality in Smart Mariculture With Deep Bi-S-SRU Learning Network by using IoT and machine learning to provide good robustness, high fault tolerance and sufficient fitting of complex nonlinear relations.

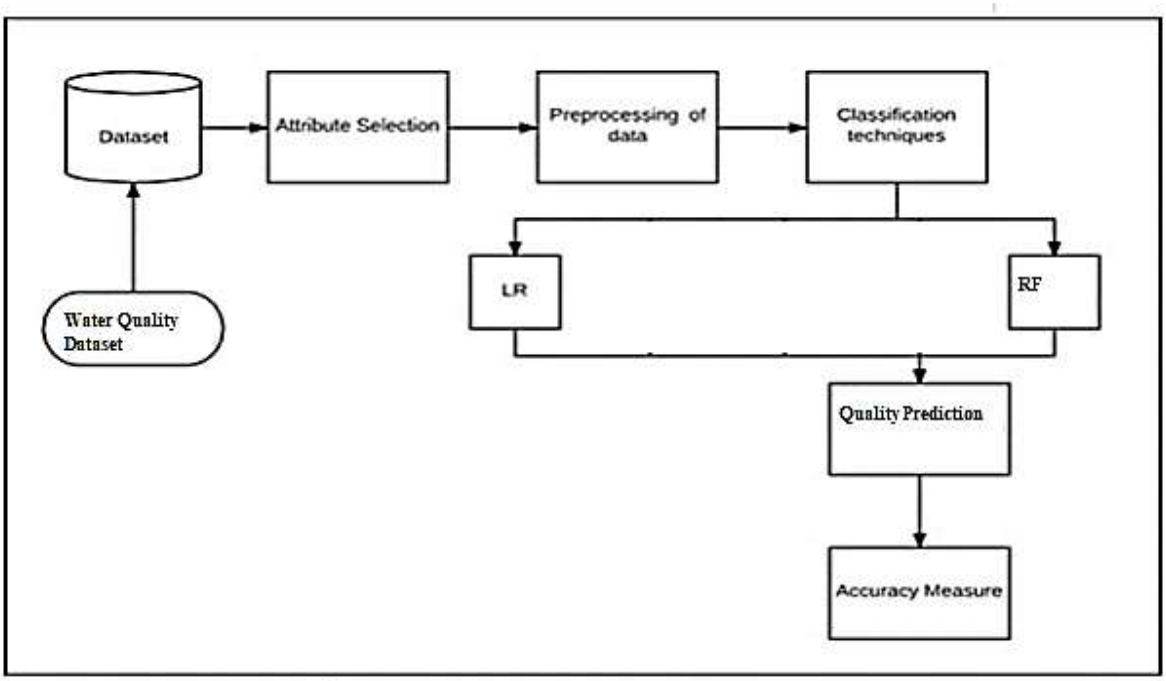
2. Maxime Lafont, Samuel Dupont, Philippe Cousin (2019) back to the future: IoT to improve aquaculture by using machine learning, Deployment of IoT Sensors Real monitoring .To Digitization and efficiency enhanced profitability Iot.

3. D VICTOR HUGO C. DE ALBUQUERQUE (2021) Internet of Water Things: A Remote Raw Water Monitoring and Control System by using IoT Architecture Development, Analogous Methods, prototype system To Resource Efficiency, Accessibility, Data-Driven Decision Making

4. Aljay R. Lorenzo, Allysa Y. Dula (2020) Dissolved Oxygen (DO) Meter Hydrological Modelling Using Predictive Algorithms by using Machine learning algorithms to provide Resource Efficiency, Accessibility ,Data-Driven Decision Making

5. Thekra Abbas Ahmed Mahfooth Mkelif Asraa Khtan Abdulkareem (2019) Web-Based Management System of water pollution using Classification Techniques by using Data Acquisition stage, Data Pre-Processing and Benefits of data mining lie in the Extraction of new knowledge automatically from the raw data to progress decision making

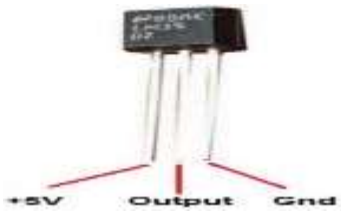
III. PROPOSED SYSTEM



A representation of a system, including a mapping of functionality onto hardware and software components, a mapping of Software architecture onto the hardware architecture, and human interaction with these components.

Temperature Sensors:

Temperature Sensor: Temperature sensors are devices used to measure temperature. They can vary widely in technology and application, but common types include thermocouples, resistance temperature detectors (RTDs), and thermistors. These sensors detect changes in temperature and convert them into electrical signals that can be read and interpreted by electronic devices.



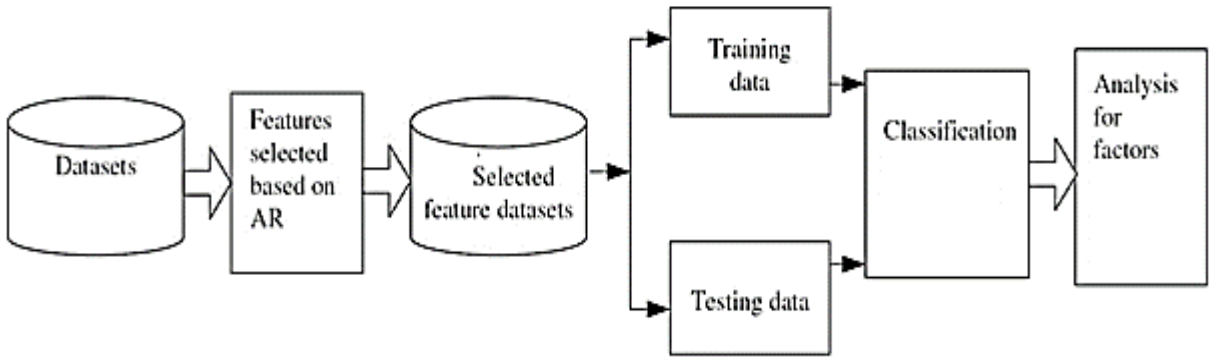
pH Sensor: pH sensors are devices used to measure the acidity or alkalinity of a liquid. They typically consist of a pH-sensitive electrode and a reference electrode. The pH-sensitive electrode generates a voltage proportional to the hydrogen ion concentration in the solution, which is then converted into a pH value.

Turbidity Sensors : Turbidity sensors measure the cloudiness or haziness of a fluid caused by suspended solids. They work by emitting light into the fluid and measuring the amount of light that is scattered or absorbed by the suspended particles.

Conductivity Sensors: Conductivity sensors measure the ability of a solution to conduct electric current. They are commonly used to monitor the concentration of dissolved solids or ions in a solution

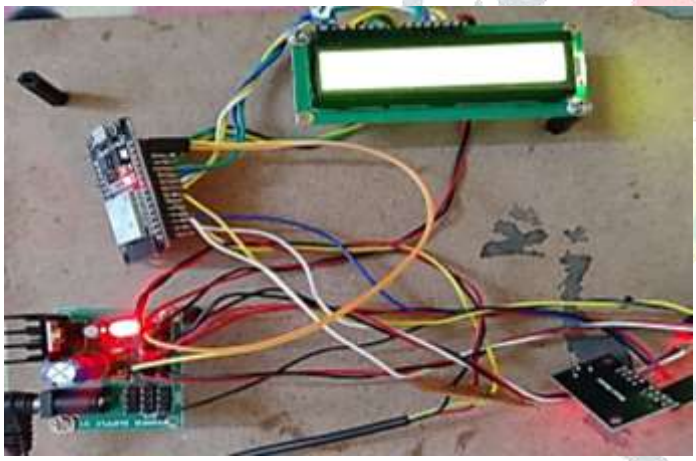
LDR (Light Dependent Resistor) Sensors: LDR sensors also known as photoresistors, are light-sensitive devices whose resistance changes in response to the intensity of light incident upon them. They are often used in light-sensitive circuits to detect ambient light levels. When light falls on the LDR, its resistance decreases, and vice versa.

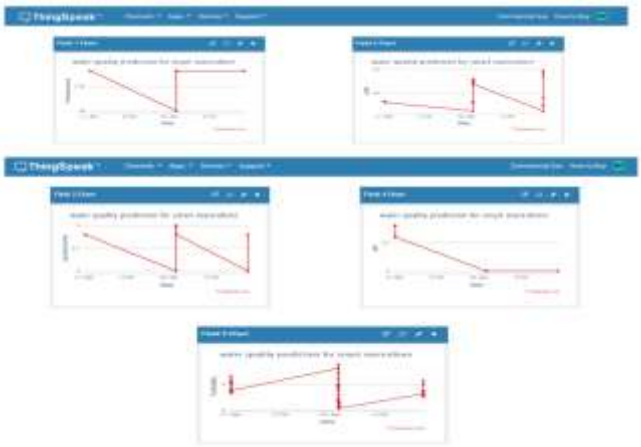
Working Flow



Working flow of Smart Mariculture System

I. **RESULT0000000**





Working and results of Smart Mariculture System

Smart Mariculture System Collects the data using sensors i.e. temperature, humidity, pH, LDR, Turbidity sensors based on the data collected and data will display through LCD display the same data will display in webpage based on the sensors data it will show the weather the water is suitable for mariculture are not based on that result we change the level of water and improve the growth rate of fishes.

Conclusion

Overall, the proposed system represents a holistic approach to water quality monitoring and management, offering tangible benefits in terms of improved environmental sustainability, reduced production costs, and enhanced productivity in aquaculture .By monitoring key parameters such as temperature, salinity, pH, and dissolved oxygen levels, the system enables precise control and optimization of aquaculture conditions. This, in turn, fosters enhanced fish growth, feed utilization, and overall production efficiency, while mitigating risks associated with environmental fluctuations. By leveraging advanced technologies and analytical techniques, it presents a proactive solution to safeguarding water resources and ensuring their continued viability for future generations.

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