

# Knowledge Based Real Time Monitoring And Control System For Aquaculture Using IOT

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**Abstract-** In past years, the most important predicted problem that is water scarcity. Due to pollution of water bodies, drinking water, water for agriculture, water use to lock surface humidity, and healthy fisheries have been severely impaired. Over five million people die annually from water-borne diseases. It has also lead to contamination of marine ecosystems and a decrease in crop yields. Unavailability of easy water quality detector has been a major cause which has led to all above-mentioned problems. The objective is to monitor a quality water level and monitoring the level of water using IoT. The main motive of this paper is used to cover the parameters of water like ph level, level of water a distance of water flow, and water flow illumination level whether water is contaminated or not, all these parameters are covered to save water and to avoid wastage of water.

**Keywords-** Aquaculture, IoT, ph, Temperature

## I. INTRODUCTION

Water is a precious natural resource with fixed quantum of Availability. This number is decreasing every year which is evident as it was 1816 m<sup>3</sup> in 2001 and 1545 m<sup>3</sup> in 2011. We lack the incentive to invest in the installations and implementation of technologically advanced systems for the organized distribution of water. Water quality suggests the synthetic, physical and natural traits of water. It is a measure of the condition of water as for the necessities of biotic creature and in addition to any human need or reason. It is most frequently used by the reference to a set of standards against which compliance can be accessed. Principles are utilized to get water quality identified with wellbeing of biological community, security of human contact and drinking water. Water is an essential need for human survival but due to rapid pace of industrialization and greater emphasis on agricultural growth combined with latest advancements, agricultural fertilizers and no enforcement of laws have led to water pollution to a large extent. Our objective is to check the quality of water. It will be monitored in Real time through using IOT.

Currently, water quality real-time monitor and water bloom prediction has been one important research task in water environment protection field. Most sample equipment's, such as sampling instruments of bottle type, horizontal type and extraction type, are used to sample water quality via watercrafts, cableways, or bridges in China now. Besides ph, water temperature and some other values which will change easily should be measured on site; water sample of other measure values should all be added preservative agent on site and sent to be measured in laboratory in specifically time. The localization of workers' technical merit and equipment's will determine the work efficiency which cannot realize monitor of moving and multiple points and will lead to shortcomings of limited monitor data and low efficiency.

In addition, the toxins aroused by itself would directly threaten human's health through the food chain. In China, water bloom phenomena occurs frequently, such as Taihu Lake, Dianchi Lake, even the Hankou River which is the biggest branch of the Yangtze River has broken out. Consequently.

## II. LITERATURE SURVEY

**Automatic Measurement and Reporting System of Water Quality Based on GSM**, 2012 International Conference on Intelligent Systems Design and Engineering Application. With the rapid development of the economy, more and more serious problems of environment arise. Water pollution is one of these problems. Routinely monitored parameters of water quality are temperature, ph, turbidity, conductivity, dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia nitrogen, nitrate, nitrite, phosphate, various metal ions and so on. The most common method to detect these parameters is to collect samples manually and then send them to laboratory for detecting and analysing. Sensor is an ideal detecting device to solve these problems. Characteristics and advantages of sensors, automatic measurement and reporting system of water quality is designed and developed. It bases on SMS (Short Messaging Service) in the GSM (Global System for Mobile Communications) network to instantaneously transfer the collected data. It also can remotely monitor the water quality

on line. The system implements automation, intelligence and network of water quality monitoring, and uses manpower, material and financial resources sparingly. But this system only measure water quality, it does not measure temperature and further critical parameters.

**An Intelligent System on Water Quality Remote Monitor and Water Bloom Prediction, 2010** International Conference on Measuring Technology and Mechatronics Automation. Currently, water quality real-time monitor and water bloom prediction has been one important research task in water environment protection field. Most sample equipment, such as sampling instruments of bottle type, horizontal type and extraction type, are used to sample water quality via watercrafts, cableways, or bridges in China now. Besides ph, water temperature and some other values which will change easily should be measured on site; water sample of other measure values should all be added preservative agent on site and sent to be measured in laboratory in specifically time. The localization of workers' technical merit and equipment's will determine the work efficiency which cannot realize monitor of moving and multiple points and will lead to shortcomings of limited monitor data and low efficiency. In addition, there are many factors leading to water bloom and the occurrence principle of water bloom is also very complex, uniform mathematical prediction model has not yet set up in the world.

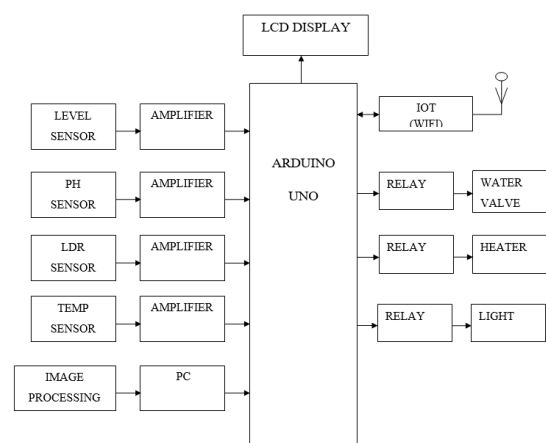
**The Lake Water Bloom Intelligent Prediction Method and Water Quality Remote Monitoring System, 2010** Sixth International Conference on Natural Computation (ICNC 2010). As a manifestation phenomenon of eutrophication, the harm of water bloom not only results in seriously polluting scarce fresh water resources, but also has bad effect on water quality and ecological environment. In addition, the toxins aroused by itself would directly threaten human's health through the food chain. In China, water bloom phenomena occurs frequently, such as Taihu Lake, Dianchi Lake, even the Hankou River which is the biggest branch of the Yangtze River has broken out. Consequently, it is clear that the advanced technology of water bloom prediction and water quality remote monitoring is imminent.

**The Water Quality Emergency Monitoring System Based On GIS And RS For Urban Drinking Water Source, 2010** 2nd International Workshop on Intelligent Systems and Engineering Application. Water quality monitoring is the primary basis of water quality evaluation and water pollution prevention. With the rapid development of agriculture and industry in China, kinds of pollutants including organic and inorganic go into the water, causing water quality increasing deteriorating and threatening people's health and further economic development. The environment of urban drinking

water source has been affected by population growth and rapid industrialization. Strengthen water environment planning and management is an important task of environmental protection in China. The monitoring and risk evaluation has been gaining more and more attention as a result of the frequent occurrences of natural disasters on our planet, especially, after the emergence of the Indian Ocean tsunami. In order to improve the power to defence disasters, it is necessary to establish the warning mechanism for various natural and human disasters.

**Smart Aquaculture System For Water Quality Management And Control Using Iot**, K.N. Power and L.A. Nagy, Relationship between bacterial regrowth and some physical and chemical parameters within Sydney's drinking water distribution system, in Water Research, Issued in Vol-5 Issue-2 2019 in IJARIE. The monitoring of physical and chemical variables such as: oxygen, temperature and ph in water are vital to maintain adequate conditions and avoid undesirable situations that may lead to the collapse of aquaculture systems. Among the technologies that can support this problem in aquaculture are the wireless sensors networks(WSN) composed of a large number of self-organized sensors deployed in a monitoring region that perceive, collect, transmit and process information from supervised objects from the area covered in a coordinated manner.

### III. PROPOSED SYSTEM



**Figure 1.**Block Diagram

The working our project is IOT based Real time water quality monitoring system. Initially the ph sensor is used to monitor the water quality and level sensor is used to check the level of water. In case the level of water or PH value is going abnormal water filter valve is activated and it will be monitored real-time by IOT App. Initially the monitor sensor

is used to monitor the level of the water and the sensor level the water is distributed and message sent user via IOT App. The temperature sensor is used to monitor temperature level of water. The valve open and close by user mobile and intimates a level of water. The ph sensor monitor or tests the water quality based on water salt content. The water flow illumination level whether water is contaminated or not using LDR sensor. Fisher thesis detection using image processing and thesis detect to message sent user via IOT App.

All these parameters are covered to save water and to avoid wastage of water. All these sensor status are monitored IOT server or android app by user. Using this project we can a test the quality of water and avoiding water wastage.

## Image Processing

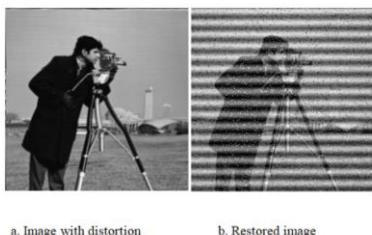
### Introduction

Image processing is computer imaging where application involves a human being in the visual loop. In other words the images are to be examined and acted upon by people. The major topics within the field of image processing include:

- ✓ Image Restoration
- ✓ Image Enhancement
- ✓ Image Compression

### Image Restoration

Image Restoration is the process of taking an image with some known, or estimated degradation, and restoring it to its original appearance. Image restoration is often used in the field of photography or publishing where an image was somehow degraded but needs to be improved before it can be printed.



**Figure 2.** Image Restoration

### Image Enhancement

It involves taking an image and improving it visually, typically by taking advantages of human Visual Systems

responses. One of the simplest enhancement techniques is to simply stretch the contrast of an image. Enhancement methods tend to be problem specific. For example, a method that is used to enhance satellite images may not suitable for enhancing medical images. Although enhancement and restoration are similar in aim, to make an image look better, they differ in how they approach the problem. Restoration methods attempt to model the distortion to the image and reverse the degradation, where enhancement methods use knowledge of the human visual systems responses to improve an image visually.

### Image Resolution

The resolution has to do with ability to separate two adjacent pixels as being separate, and then we can say that we can resolve the two. The concept of resolution is closely tied to the concepts of spatial frequency. Spatial frequency concept, frequency refers to how rapidly the signal is changing in space, and the signal has two values for brightness-0 and maximum. If we use this signal for one line (row) of an image and then repeat the line down the entire image, we get an image of vertical stripes. If we increase this frequency the strips get closer and closer together, until they finally blend together. In image we observe many brightness levels and the vision system can adapt to a wide range. If the mean value of the pixels inside the image is around Zero grey level then the brightness is low and the images dark but for mean value near the 255 then the image is light.

## IV. RESULT AND DISCUSSION

In this effective way we are monitoring a quality of water and monitoring level water. Water is main needed source of human and environment. Most of the diseases spread through the bad quality of water. For this reason we are creating this project to drink quality of water and using a quality of water for agriculture environment. Using our project we can easily find the water quality and level of water. The main feature of this project is we are using IOT based monitoring system and based on water level we can automatically turn on the pump.

## V. CONCLUSION

The status ph sensor monitoring the water the quality it will be display in IOT server and level sensor status also displayed in IOT server. Using these project we are drinking a quality of water and it will used for different applications like agriculture.

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