Fish Talk:An IoT-Based Mini Aquarium System

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***Abstract*: Many people feed pet fish in the aquarium tanks that need to be properly set up and maintained, or the fish will be destined to unpleasant and short life. Therefore it is critical to monitor water conditions closely and improve the water quality for the mini aquarium tanks. Based on an IoT solution called IoT Talk, this paper proposes the FishTalk system that utilizes the aquarium sensors to drive the actuators in real time. We describe the relationship between aquarium sensor and the actuators, and give concrete example varius water condition .As an example we implement an intelligent fish feeding mechanism such that the fish are neither over nor under fed, and at the same time, the fish owner can enjoy watching fish feeding remotely. We have also developed analytic model, simulation and measurement experiments to investigate the effect of IoT message delays and loss on water condition control.**

***Keywords*: Performance Evaluation, Aquarium, message lost, Internet of Things (IoT), NB-IoT.**

1. INTRODUCTION

It is module design with an arduino mega and a lot of I/O for a serious fish tank. Home automation with ESP8266 Wifi module .The project is an automated system to take care of fishes.The maintenance fish aquarium is a very difficult task itself.whenever you have to clean up your aquarium or you have to feed , you have to do a lot of things. You have to do a lot of things. you have to turn off your aquriums. Power head/air pump and feed manually and turn on.Tn the current system all equipments such as light, pump, filter, food feeder, temperature sensor etc.

The project with which we come up is a smart aquarium. The project will be more efficient than the system available in market. Nowdays, In addition to the efficiency it will be of lower cost as well the project is an automated system to take care of fish. It will replace the manual maintenance of fish aquarium with its automated functions.

1.1 Aim

The aim for this research is to develop fish feeder to automatically dispense flakes twice a day or more according to user interest every day. The system should also able to keep the flakes dry and should monitor the total amount if the flakes. The should able to send SMS notification to the owner if the flakes amount goes below preset minimum amount. The system should also monitor the overall environment of the aquarium using different sensors and update the user by SMS communications. The aquarium will perform all the steps automatically the temperature control, turbidity level control, water renewal etc. …The aim of our project is to replace manual maintenance of fish aquarium with an automated system by using IOT.

1.2 Motivation of the Project

Every day there are some new invention in almost every field, in the wold is become in very fast and automatic because of these inventions day by day. So we have decided very cheap alternative to make the process of maintaining the fish aquarium fully automatic.

1.3 Objectives

To design the develop automatic fish feeder for indoor aquarium.to monitor the environment of the aquarium and update the user by sending SMS. To evaluate the performance of the development mechanism.

The objective of proposed is to design and construct an automatic aquarium for those who cannot take care and keep an eye on their fish possible .The aquarium will perform all the step automatically like temperature control, automatic feeding, water changing LCD display.

2. LITERATURE SURVEY

Paper 1: Automated aquaculture system that regulates PH, temperature and ammonia.
Change water manually.ph scale is made up of material which does not disturb the solution which are testing.
Paper 2: Smart Water quality Monitoring System.
Power saver. Water maximization. Money saver
Paper 3: Automatic Aquarium Monitoring for the fish farm Aquaculture environment
Maintain oxygen level near saturation or even at slightly super-saturation at all times. It would be much easier to administer in year 2015.
Paper 4: An Embeddeed Fuzzy Decision System Aquaculture.
Similar to human reasoning. Based on linguistic model. High precision in year 2014.

3. ARCHITECTURE

3.1 Problem Statement / Definition

In large scale aquarium monitoring is done manually. A person may do mistakes due to the human nature. It is difficult to maintain aquarium for working people Unacceptable changes in the levels of water parameter values affect the life of aquatic animals. This motivated us to build a system which automatus the manual work to maintain the aquarium with minimum persons required using internet technology. So we design automatic system that maintains fishes needs like food water impurity, and clearing of aquarium. This project describes a system for the summarization of single and multiple documents. The system produces multi as well as single document summaries using data mining techniques for identifying common terms across the set of documents. For each term, the system identifies
Representative passages that are included in the final summary. Results of our evaluation are also presented.

3.2 Proposed Architecture

We are introducing system, Fish Talk which consist of sensor, Actuator and ESP8266 Wifi Module. In this Fish Talk system, An actuator are connected to ESP8266 Wifi module. The sensors are temperature, level TDS sensor etc.
The actuators are Pump1, Pump2, Passive filter and food feeder.
The actuators To control the dissolved gases and other factors that affect the health of fish etc.

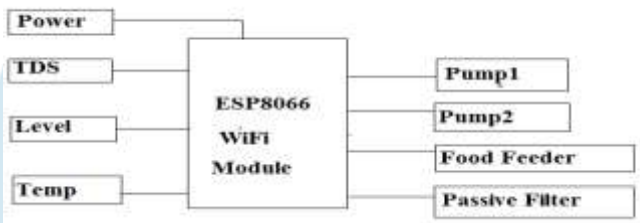

Fig 3.1:Proposed Architecture Diagram

A. TEMPERATUR SENSOR

Temperature sensor measure the amount of heat energy or even coldness that is generated by an object or system. For most fishes, the optimal temperature ranges from 25^c to 27^c Extreame changes in temperature are more harmful to fish than constant high or low temperatures. The water temperature also interact with factors such as elevated ammonia and decreased oxygen.

B. FOOD FEEDER

Aquarium fish feeders are electric or electronic devices that are designated to feed aquarium fish at regular intervals. They are often used to feed fish when the aquarist. Is on vocation or is too busy to maintan a regular feeding schedule.
The automatic feeders can be successfully used to feed fish.

C. TDS SENSOR

TDS meter scan measure all of the organic and in organic material in molecular form in your water. This include nitrite, kH etc. They are in a molecular form, TDS or total dissolved solving. High concentration of TDS scan reduce water clearity and decrease photosynthesis in aquatic plants. It can also combined with toxic compounds and havy mettle leading to an increase in water temperature. TDS meter to keeps track how face your TDS fluctuates.

D.CARBON DIOXIDE

Fish CO2 required by this plants to balance the aquarium otherwise algae can quickly take over the tank. It is importants to remember CO2 can cause pH swings the aquarium at carbon dioxide when dissolved in water is acidic. In the same way as garden plants, at aquatic plants, need lighting , fertilizers and CO2. This are essential factors governing the speed of the growth and health.CO2 is required by these plants to balanced the aquarium otherwise algae can quickly take over tank.

E.OXYGEN

Filter go a long way toward increasing oxygen in the water, as because water movment as the surface near oxygen exchange occure. Filter also move water from the top to the bottom at the tank, thus distributing oxygen throughtout.

F.AMMONIA

Free Ammonia is extremely toxic to fish. High ammonia concentration can cause a decrease in blood serum ATP and lead to tissue necrosis. This further increases the energy demands on the gill organism. Ammonia poisoning also occurs if the water is not changed

regularly or if bacterial colonies die off due to a sudden change in water conditions or the use of medications.

CONCLUSION

The Conclusion of this project relationship between aquarium sensors and the actuators.We showed hoe to intelligently feed the fish through a combined automate and manual control mechanism such that the fish are neither over nor under fed, and at the same time, the fish owner can enjoy watching fish feeding remotely.

Our solution allows the designer to quickly deploy intelligent control for various water conditions. We have developed analytic model, simulation andλ measurement experiments to investigate the effects of IoT message delays and loss on the water condition control.

REFERENCES

[1] Mohamad Abdurrazzaque, Marijamilojevic-Jevric, Andrei Palade, And SiobhánClarke,Middleware For Internet Of Things: A Survey,

[2] A Novel Design and implementation of automated feeding mechanism in fish Aquarium Mohammad abdulhye; MdManjurulAkter; Atiq Mohammad Jahangir; Hasan U. Zaman 2018 2nd international conference on electronics, Materials Engineering and Nano-technology (IEMENTech). Year: 2018, IEEE conferences.

[3] Automated aquaculture system that regulates pH, temperature and ammonia. Aaron Don M. Africa; Jeremy Czar Christian A. Aguilar; Charles Martin S. Lim; Paulo Arnel A. Pacheco; Steven Edward C. Rodrin, 2017 IEEE 9th international conference on humanoid, nanotechnology, information technology, communication and control, environment and management(HNICEM). Year:2017, IEEE conferences.

[4] NurlianiHidayahRitonga; AgungNugrohoJati; RifkiWijaya, 2016, May. Automatic Arowana Raiser Controller Using Mobile Application Based on Android. In 2016 IEEE Asia Pacific Conference on Wireless and Mobile (APWiMob) (pp.86-87).IEEE.

[5] Prasad, A.N., Mamun, K.A., Islam, F.R. and Haqva, H., 2015, December. Smart water quality monitoring system. In 2015 2nd Asia-Pacific World Congress on Computer Science and Engineering (APWC on CSE) (pp. 1-6). IEEE.

[6] Automatic Aquarium Monitoring for the fish farm Aquaculture environment Jui-Ho Chen ; Wen-Tsai Sung ; Guo-Yan Lin 2015 IEEE International Conference on systems, man and cybernetics. Year: 2015, IEEE Conferences

[7] TaotaoXu ,Feng Chen , 2014 August. An Embedded Fuzzy Decision System for Aquaculture. In 2014 2014 IEEE Workshop on Electronics, Computer and Applications.(pp.351-353).IEEE Conference Publications.

[8] Noor, M.Z.H., Hussian, A.K., Saaid, M.F., Ali, M.S.A.M. and Zolkapli, M., 2012, July. The design and development of automatic fish feeder system using PIC microcontroller. In Control and System Graduate Research Colloquium (ICSGRC), 2012 IEEE (pp. 343- 347).IEEE.

[9] Chiu, M.C., 2010. A Multi-functional Aquarium Equipped with Automatic Thermal Control/Fodder-Feeding/water Treatment using a Network Remote Control System. Information Technology Journal, 9(7), pp.1458-1466.