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Research Article

AN ARTIFICIAL INTELLIGENCE BASED ADVANCED FISH FARMING

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Abstract

In current years, the advancement of innovation has been quickly improving and applying in hydroponics, otherwise called water cultivating. A flexible, progressed Fish cultivating dependent on Raspberry pi. A pH sensor, temperature sensor, water level sensor, turbidity sensor are utilized here to screen the abrupt strange change in the state of the FISH lake. Other than that, Raspberry pi is utilized as a worker to control all the sensor hubs in this framework. The framework additionally sends an alarm message through SMS administration to provoke the client when required or to screen the framework on the cell phone. Hence, time utilization, labor, endeavors of the rancher can be decreased. The proposed configuration has been effectively arranged with a reliable, quick reaction and simple to use with an amicable climate. It is fitting for little to moderate sized cultivating tasks as it doesn't need any renovating of the water front. In this work, a remote sensor stage is created, applied to the estimation of temperature, pH and water level in the climate FISH lakes. The control stage comprises of Raspberry pi to control all the framework. Then, at that point the man-made consciousness framework is created to accomplish information from sensor network anyplace through web application just as Android application. The framework is checked continuously and can be controlled physically or naturally.

Key words:- Raspberry pi, pH sensor, LDR, Turbidity sensor, Thermistor, Thing speak cloud, Twilio

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I. INTRODUCTION

Lately, the progression of development has been rapidly improving and applying in hydroponics, in any case called water developing. A versatile, low power course of action in noticing and control system reliant upon Raspberry pi. A pH sensor, temperature sensor, water level sensor, turbidity sensor are used here to separate the unforeseen strange change the condition of the FISH lake. Other than that, Raspberry pi was used as a worker to control all the sensor centers at this moment. The system also sends a prepared message through SMS organization to incite the customer when required or to screen the structure on a wireless. As such, a minimization of biological differences achieved by unforeseen changes similarly as work is decreased. The proposed system has been successfully arranged with a reliable, speedy response and easy to use with welcoming Conditions. It is sensible for little to medium estimated developing assignments as it doesn't need assessment of temperature, pH and water level in the earth FISH lakes. The control stage contains Raspberry pi and it controls all the system. By then, the agreeable structure is made to achieve coordinated sensor data from wherever through web application similarly as Android application.

A. pH metre board

Fig 1.1 pH meter

A pH Meter is an instrument utilized for estimating the corrosiveness and base substance. The fixation or the movement of hydrogen particles, of a fluid arrangement is the fundamental boundary utilized for estimating the pH esteem. The anodes utilized in it are dominatingly glass cathode in addition to a calomel reference terminal, or a blend of both the cathodes. [1] pH meters are typically used to gauge the fluids pH content, albeit some exceptional tests are here and there used to quantify the pH of semi-strong substances.

B. Water level Sensor

Level sensors distinguish the fluids and different liquids levels that show an upper free surface. Level sensors can be utilized to distinguish where a fluid falls under a base or transcends a greatest level. The sensors carried out here is interfaced with the raspberry pi .

The information will be shipped off the raspberry pi for the further examination.

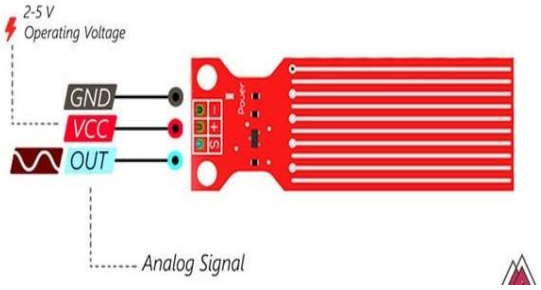

Fig 1.2 Water level Sensor

C. Thermistor

A NTC thermistor is a warmth delicate resistor whose obstruction capacities display a colossal, precise and unsurprising decrement as the center temperature of the resistor increases over the scope of working temperature. The data that is collected will be sent to the raspberry pi to take the further action.

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Fig 1.3 Thermistor

D. LIGHT DEPENDENT RESISTOR

Photograph conductivity is the rule behind working of a light reliant resistor. Photograph conductivity is an optical event where the materials leading ability (Hence resistivity) diminish when light is fascinated by the material.

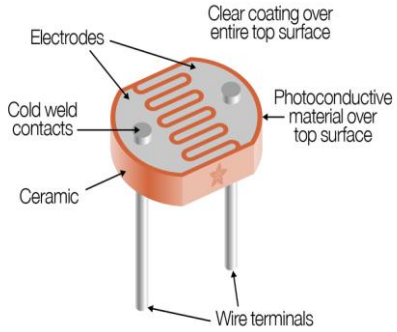

Fig. 1.4. Light Dependent Resistor

E. Turbidity sensor

The turbidity sensor coordinates a shaft into the water portion under test. The particles in the water get mirrored by light bar and the last light power is estimated by the turbidity sensor's photodetector situated at 90 degrees to the light bar. It gives the simple qualities as the yield.

Fig. 1.5. Turbidity Sensor

II. LITERATURE REVIEW

From past related works refreshing the sensor data and mirroring the genuine components of natural FISH cultivating isn't examined. This framework will be work putting something aside for the rancher and report natural changes right away. The investigation results in [2] show that the data combination calculation proposed in the paper works with high exactness and it can appraise multi-record of water quality.

This model in [3] focuses on giving the arrangement, for example, which medication ought to be applied or fundamental move to be made as an alarm message when the boundaries showing the nature of water changes. The testing result in [4] shows that the level of blunders are little and sensor information has been effectively shipped off cloud worker.

III. HARDWARE IMPLEMENTATION

In this work, a remote sensor framework is created, applied to the estimation of temperature, pH and water amount level in the FISH lakes. The control stage comprises of Raspberry pi to control all the framework. Then, at that point the amicable framework is created to accomplish information from sensor network anyplace by means of web application. The framework is observed constant and can be controlled manual or consequently.

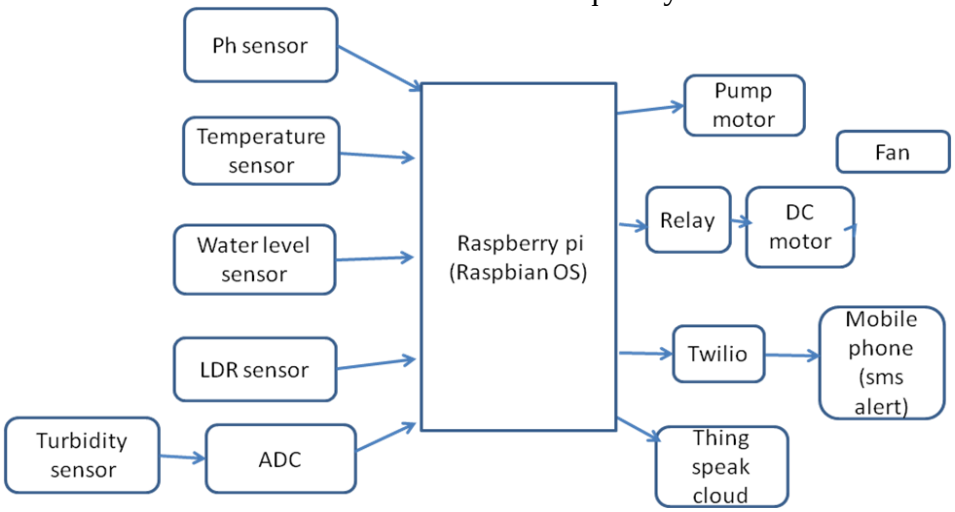

Fig 1.6 Block diagram

Here the pH sensor sheets itself comprises the sensors like thermistor, LDR, water level sensor. These sensors are connected with Raspberry pi. Since the turbidity sensor gives simple qualities it is associated with the ADC to change over them into advanced qualities. Raspberry pi is utilized to store and dissect the qualities and furthermore it will control the actuators to deliver some yield.

IV. SOFTWARE IMPLEMENTATION

A. Thing speak

ThingSpeak is an IoT examination stage administration that permits you to summate, conceive and explore live information streams in the cloud. ThingSpeak gives moment imagines of information presented by your sensors on ThingSpeak. The capacity to execute MATLAB® code in ThingSpeak facilitates the way toward performing on the web investigation and preparing of the information as it comes in. It utilizes RESTful API

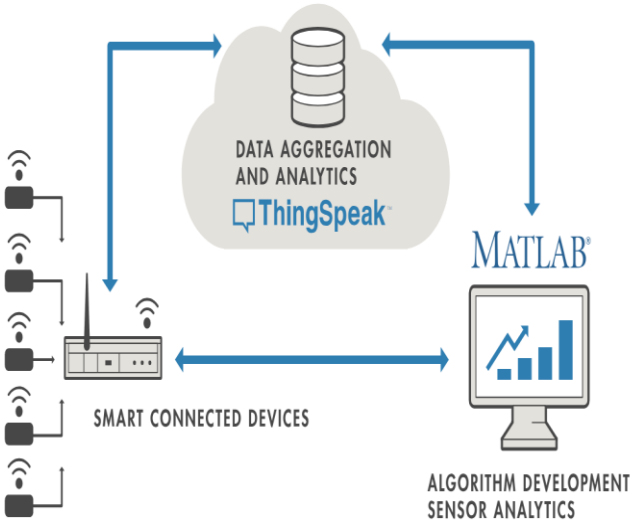

Fig. 1.7. Think Speak Framework

Sign In to ThingSpeak using your MathWorks Account. Click Channels My Channels. On the Channels page, click New Channel. Click the boxes next to Fields 1–3. Enter the following preset values.

Name: FISH pond conditions

- Field 1: ph level
- Field 2: water level
- Field 3: light intensity
- Field 4: temparature

B. Twilio

Any gadget associated by a Twilio SIM can send and get Programmable SMS messages. SMS informing support is compulsory for the gadget. The SMS cost additionally needs to done by the

instrument. SMS messages to or from an instrument are controlled utilizing TwiML program highlight. For machine-to-machine (m2m) SMS, explicitly for cloud-to-gadget and gadget to-cloud interchanges the API orders are utilized.

Correspondences APIs empower voice, informing, and video discussions inside web and portable apps.Programmable availability alternative offer certain telephone numbers, SIP trunking, informing associations, and cell association foundation inside gadgets. Use-case APIs power more elevated level reflection for tasks, for example, verification include, call directing, and message control.

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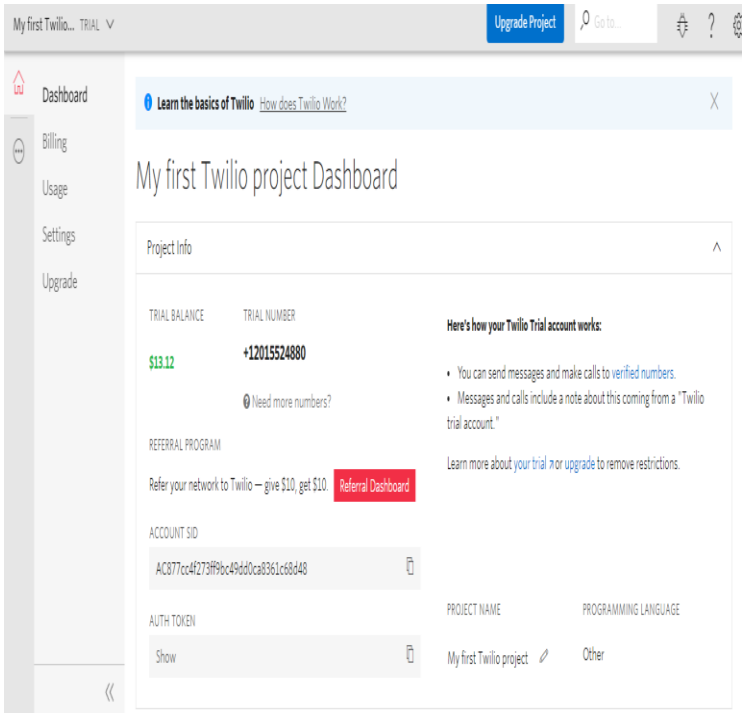

Fig. 1.8. Twilio Project Dashboard

V. RESULTS

States of the FISH lake are checked by utilizing the sensors and the information is broke down by utilizing the raspberry pi.Immediate ready message is shipped off the rancher utilizing twilio cloud.All the information will be put away in the thing talk cloud and can be utilized for the future reason. By utilizing the actuators prompt move is made if there should be an occurrence of providing oxygen by pivoting fans. Coming up next are the grouping of steps engaged with estimation.

STEP 1: This is the initial step where all connections are given.

STEP 2: In this step the pH sensor and the turbidity sensor are placed in the water for testing the parameters present in the water. Here pH sensor is directly connected to the raspberry pi. where the turbidity sensor is connected with the ADC to convert the analog values to digital.
STEP 3: When the required power supply is given to the raspberry pi, if LED glows which indicates that the setup is properly connected.
STEP 4: With the remote view option present in the laptop the raspberry pi will be connected and the Raspbian OS will be viewed in the laptop.
STEP 5: The folder is opened where the required program is selected for execution.
STEP 6: The threshold necessary for maintaining the normal values is set using python program.
STEP 7: The terminal window is opened for executing the program.
STEP 8: The terminal window will have the current parameters of the pond that is monitored.
STEP 9: All the data is also stored in the ThingSpeak cloud and also the level increase or decrease will be denoted in the form of charts and also data can be collected in the form of excel sheet.

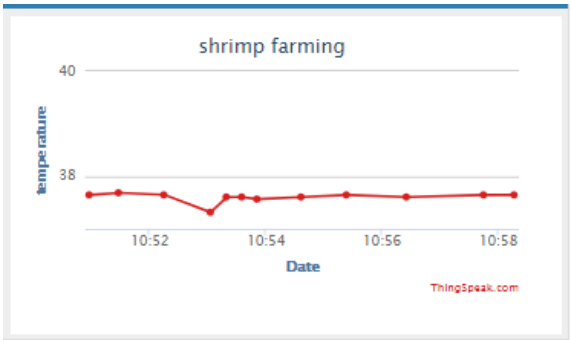

Fig 1.9 Temperature Output

Fig 1.10 Light intensity Output

Fig 1.11 Water Level Output

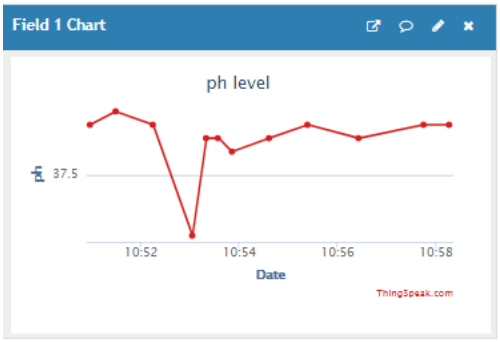

Fig 1.12 pH Level Output

Fig 1.13 Turbidity Level Output

The outputs from the sensors are directly linked with the network available through Raspberry Pi and the dats are instantaneously available to the users through SMS.

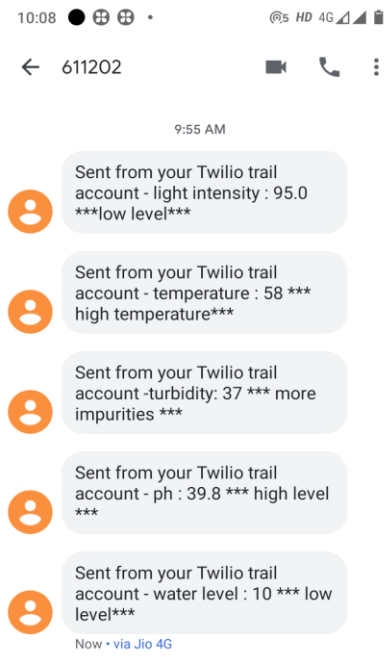

Fig. 1.14. SMS Alert in Mobile

VI. CONCLUSION

This endeavor will help the water farmers whose huge work is the FISH developing. For them, it will be amazingly hard to industriously screen the lake which incorporates a package of money, time and the undertakings of the farmers. From this undertaking we will screen the state of the FISH lake by utilizing the Raspberry pi. Likewise the time, cash and the endeavors of the ranchers are diminished and the creation of the FISH will be expanded. Later on for precise outcomes the oxygen sensor to gauge the oxygen broke up in the water can be incorporated. Additionally the salt sensor can be utilized to get the salt substance present in the water precisely and furthermore the blending of the salt into the water at right extents can be made consequently

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