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Smart Biofloc Fish Farming Using Machine Learning

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Abstract: This project is mainly on building an Aquarium Monitoring System using a single chip computer called Arduino. The main purpose of this project is to help those who are having difficulties in maintaining their indoor aquariums, especially those who are frequently outstation, thus unable to constantly monitor their aquariums. Through the use of this system, users can monitor and maintain their fish aquarium regularly via internet, using devices such as smartphones and laptops. The major role of this system is to enable users to monitor and maintain their fish aquarium through a server of database, which include tasks such as feeding the fishes on time, checking the water temperature, water level, and changing the water automatically, whenever the turbidity level of the water reaches a pre – determined unsafe point for the fishes. When there are emergencies such as water leakage in aquarium or the drop of the water level of aquarium to below normal levels, the system would trigger an alarm and send a message to notify the user to take any appropriate action. In order to continuously check the aquarium's status, the Arduino is chosen as central board to collect data from sensors and subsequently uploads the data to the database and to the own host website.

I. INTRODUCTION

The fish keeping is popular fad. Fish Keeping is itself an industry which comes in agriculture. The scope behind developing IOT based fish feeder is to reduce manual work. This device can provide regular feeding without disrupting the owners work, owners can monitor feeding process with their smartphone virtually. Fish feeder using wireless communication the system can be implemented by setting fish feeder feed fishes at a certain time you can command it for dispatched the food.

It will replace the manual maintenance of the fish aquarium. In this system we using two container (one big and one small container) big container is fish food storage and small container is dispatch container. Small container dispatch food in tank when users command to dispatch. The Fish feeder will be atomized and can be easily controlled from the mobile phone via web application anytime anywhere in just one click using a dashboard.

II. PROPOSED SYSTEM

The proposed IoT-based fish feeder integrates sensors for water monitoring, a microcontroller for processing data, and a motor-driven feeder. The system allows for remote operation via an app or web interface, ensuring automation and real-time control.

III. METHODOLOGY

Since water quality is an important aspect in human life, this project contributes in the direction of monitoring the quality of water. The system proposed here is a water quality monitoring system in the Arduino platform that measures the pH, conductivity, temperature, and presence of suspended items on the water bodies like lakes and rivers using sensors.

These sensed parameters are sent to the authorized person via GSM system in the form of messages, so that proper action can be taken by the authority in cleaning the water bodies to reduce the possible health problem that could occur.

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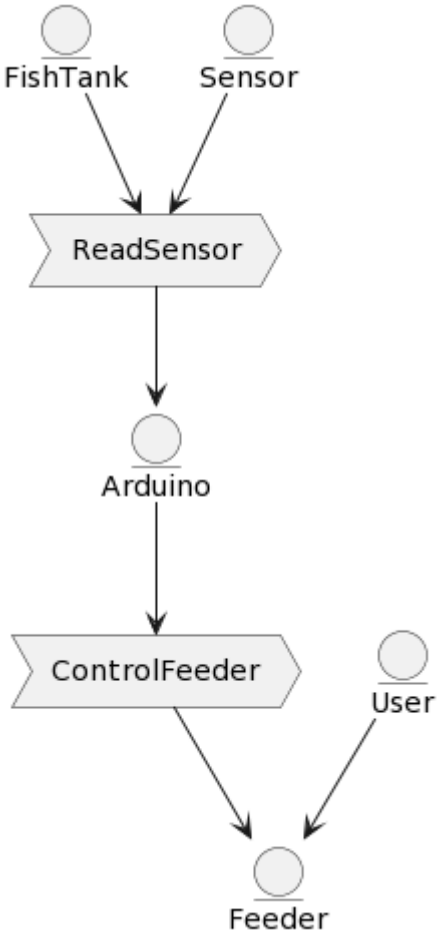
IV. SYSTEM ARCHITECTURE

- Project's basic principle of working is the sensing of data from the sensor .
- Convert the analog (voltage) data into digital form.
- Process the digital data and display it on LCD.
- Compare the threshold value and send to the IOT page.

DATA FLOW DIAGRAM



USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses.

This diagram illustrates the interactions between the User, the Sensor (measuring food level), and the Arduino board, which controls the fish feeder automation system. The system allows the user to configure feeding schedules, monitor fish feeding, adjust feeding settings, and receive alerts for low food levels.

ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. This diagram represents a basic activity flow for the fish feeder automation system. It starts with checking the status of the sensor. If the sensor detects the presence of fish, the system dispenses food, waits for a specified time, and then repeats the process by checking the sensor status again. If the sensor doesn't detect fish, the system does nothing and waits for the next sensor reading before checking the status again.

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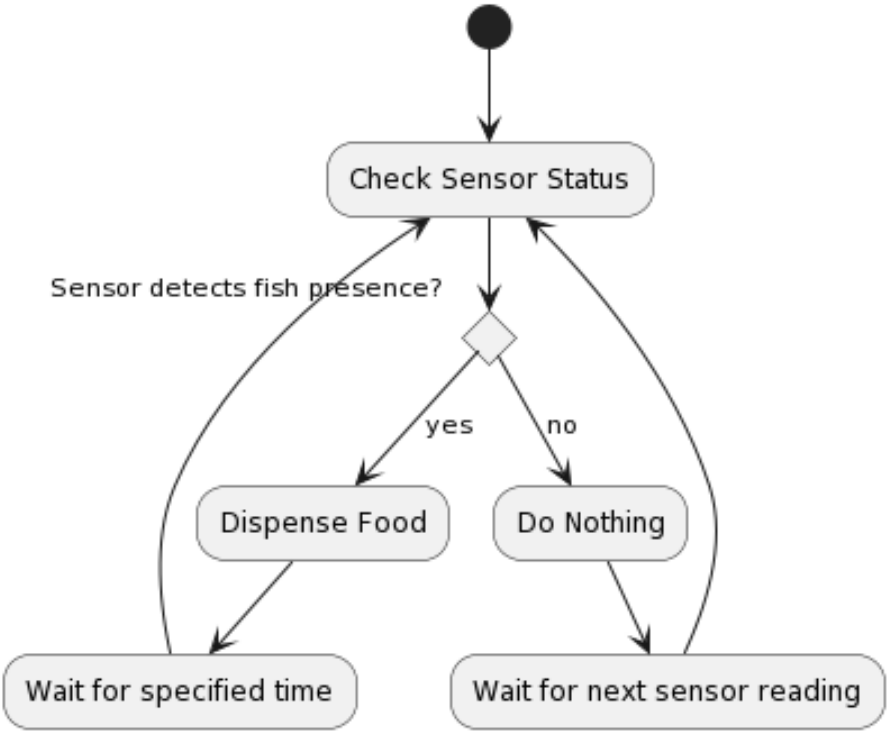

V. RESULT

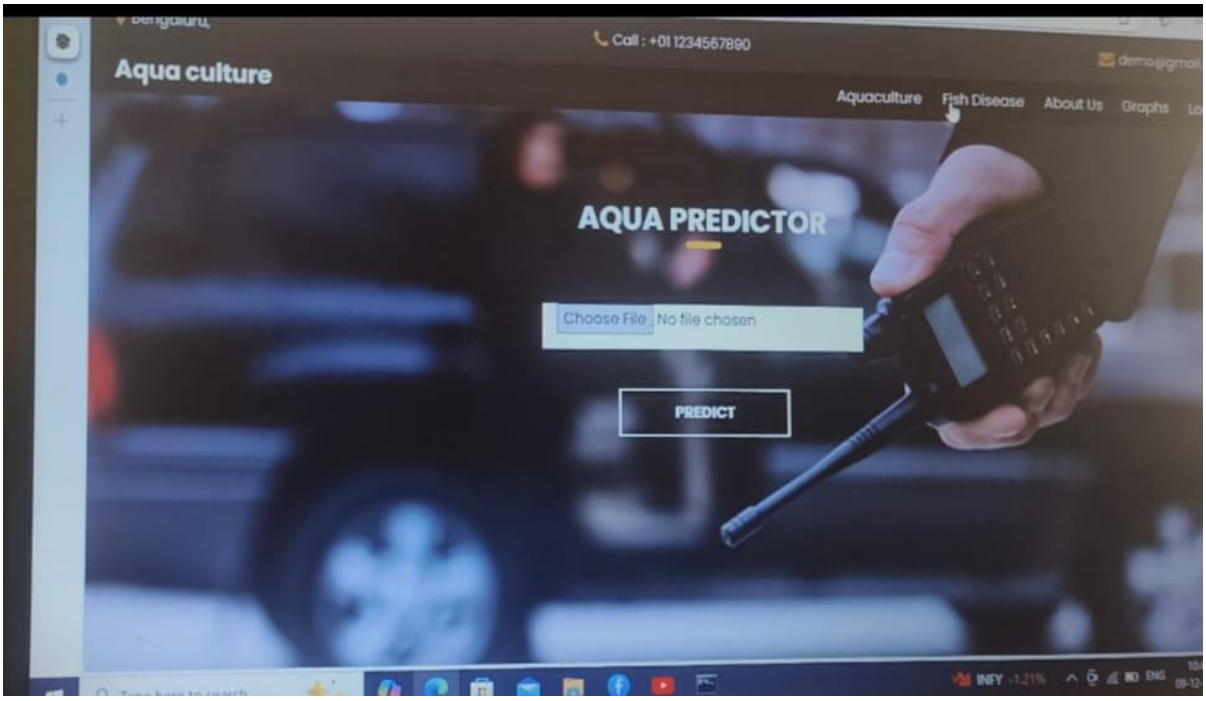

FIG 01:PAGE FOR FISH DISEASE PREDICT

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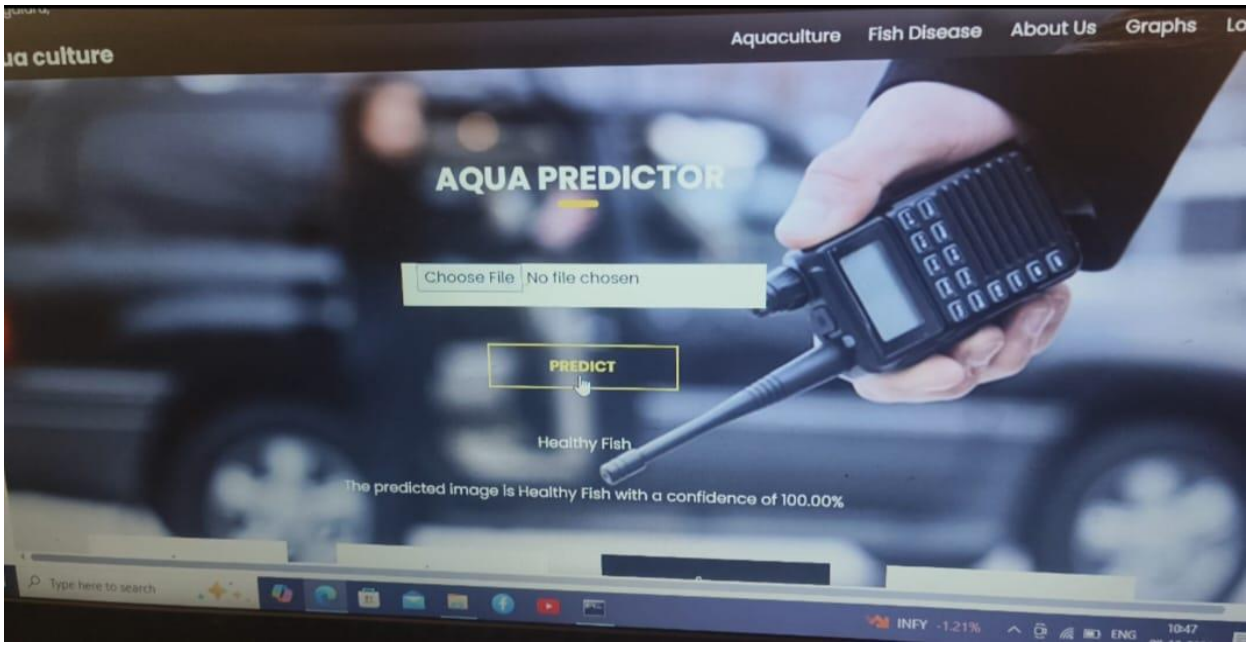

FIG 02: PREDICTED PAGE

FIG 03:TURBIDITY DETECTION

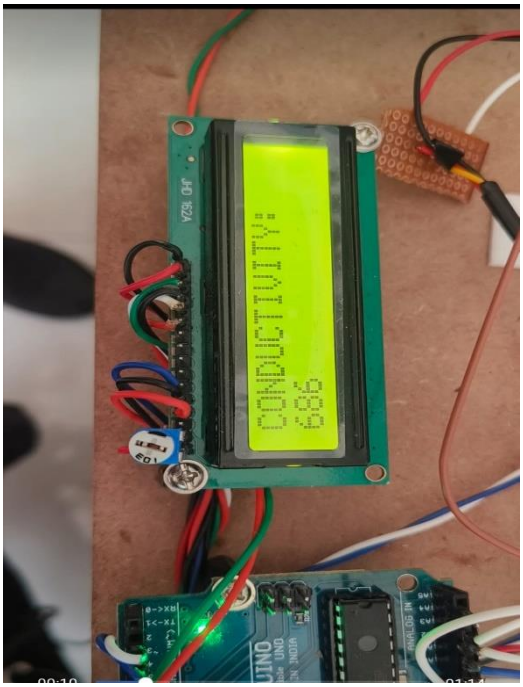

FIG 04:CONDUCTIVITY DETECTION

VI. CONCLUSION

In the present world everything is moving towards automation to reduce work pressure of human. As per the literature review previously designed systems over not so efficient at their working and also not economically reliable in the view of usage. Particularly microcontroller based embedded systems has less memory size along with the limit in interfacing peripherals this leads to lag in the deployment of the systems. Therefore here proposed and automated Arduino based aquarium monitoring system that enables easy control over the several issues of aquarium such as temperature variations, feeding schedule, turbidity level, lighting system which contains sensors to gather the information required for desired actuation using Arduino controller. Which provides efficient automated control over the issues.

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