

**A
Presentation
on**

“IOT Based Aquaculture Monitoring System”

**Bachelor of Technology
in
Department of Electronics & Communication Engineering**



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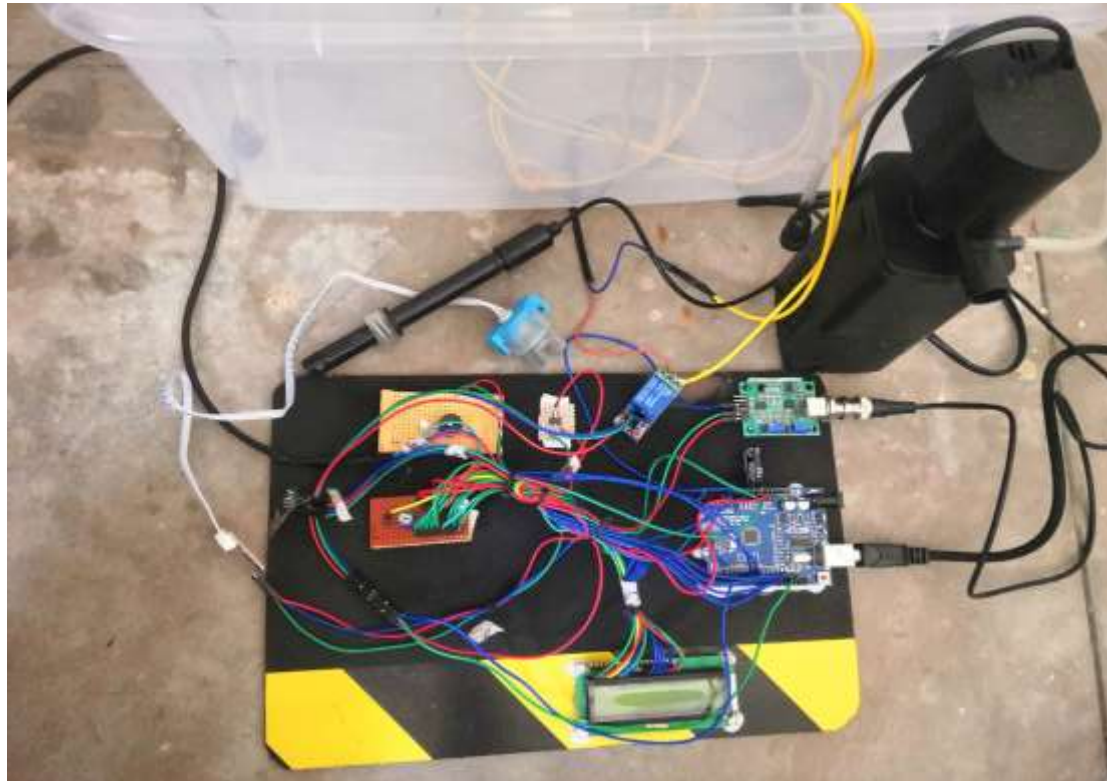
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IOT BASED AQUACULTURE MONITORING SYSTEM



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INTRODUCTION

- According to The United Nations Food and Agriculture Organization (UNFAO), "Worldwide yearly production of fishery items adds up to around 128 million tons".
- Commercial aquaculture is confronting numerous issues because of sudden climatic vacillation leading to the changes in water quality parameters.
- Manual procedures of monitoring are hectic and inaccurate so, modern technology should be brought to overcome this issue.
- Internet of Things(IoT) is a boon for such kind of issues as it provides direct integration of the physical world to computer based systems.
- It describes physical objects with sensors, processing ability software and other technologies that connect and exchanges data with other devices and systems over the internet or other communication network.

OBJECTIVES

❑ The objectives of our project is to design an Aquaculture Monitoring System by using IoT as given below :-

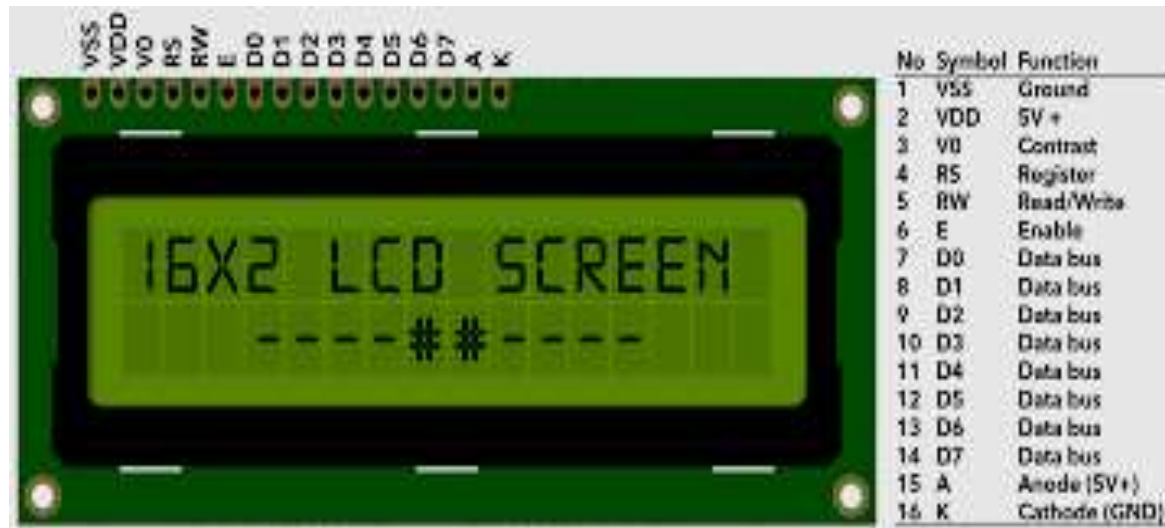
- To monitor the pH.
- To monitor temperature and turbidity

HARDWARE USED

- LCD 16*2
- ARDUINO UNO(AVR Atmega328PU)
- WI-FI MODULE(ESP8266)
- TEMPERATURE SENSOR(LM35)
- pH SENSOR
- TURBIDITY SENSOR(AZDM01)
- BUZZER
- RELAY
- PUMP
- LED INDICATOR
- JUMPING WIRES

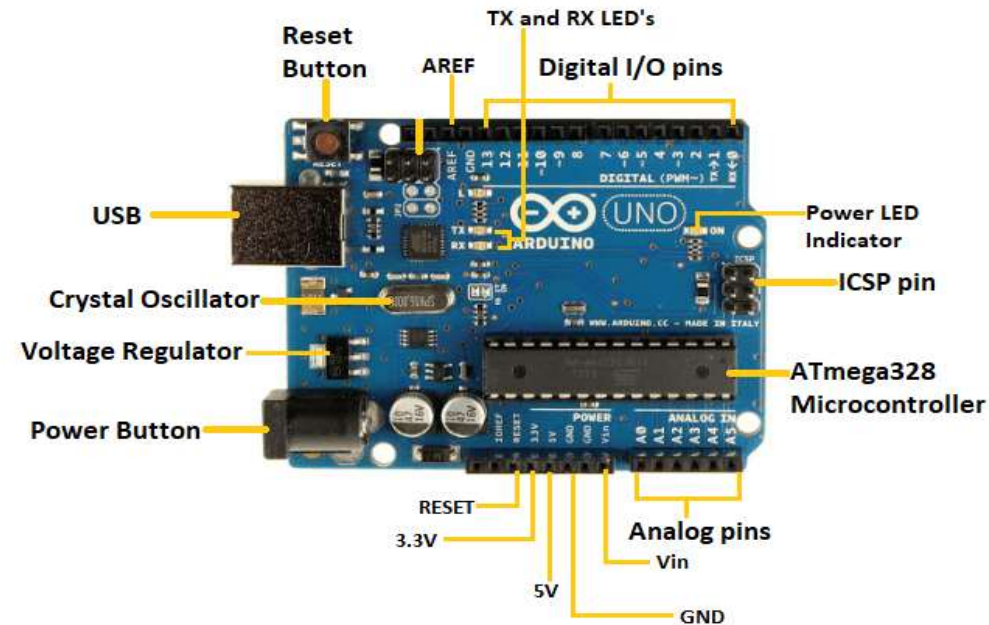
LCD(16*2)

- The LCD 16*2 is a popular display module used in various electronic devices.
- The module can display upto 32 characters at a time.



ARDUINO UNO

- Arduino Uno(AVR ATmega328PU)
- It is an open source electronic prototyping platform based on flexible easy to use hardware and software.



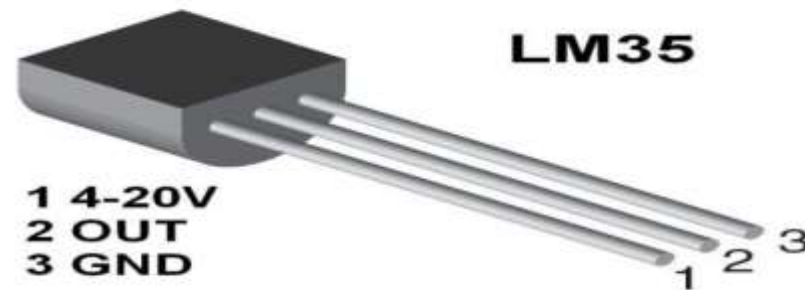
WI-FI MODULE(ESP8266)

- The ESP8266 Wi-Fi Module is a self-contained SOC with an integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network.
- The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.



TEMPERATURE SENSOR(LM35)

- LM35 is a three terminal device
- It can measure temperature from -55 degree Celsius to +150 degree Celsius.
- It can be operated from a voltage 5V supply and the standby current is less than 60uA.



pH SENSOR

- Used to measure the amount of alkalinity and acidity in water.



TURBIDITY SENSOR

- AZDM01 has a built-in photoelectric sensor.
- The turbidity of the liquid is calculated by detecting the change in the voltage signal at the output terminal



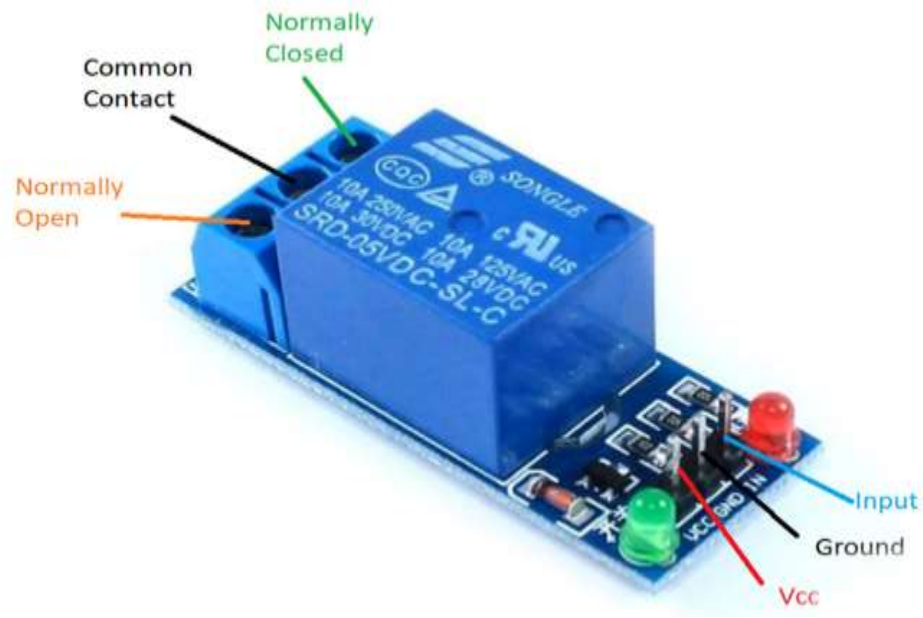
BUZZER

- A buzzer is an electronic device that produces a sound or tone when a voltage is applied to it.



RELAY

- A relay is an electronic switch that allows a low power signal to control a high power circuit.



PUMP

- A pump is a device that moves fluid by mechanical action ,from one place to the other.
- It is used to filter and circulate water.
- It is essential for maintaining the clean and healthy water and they came in a variety of sizes and capacities to meet different needs



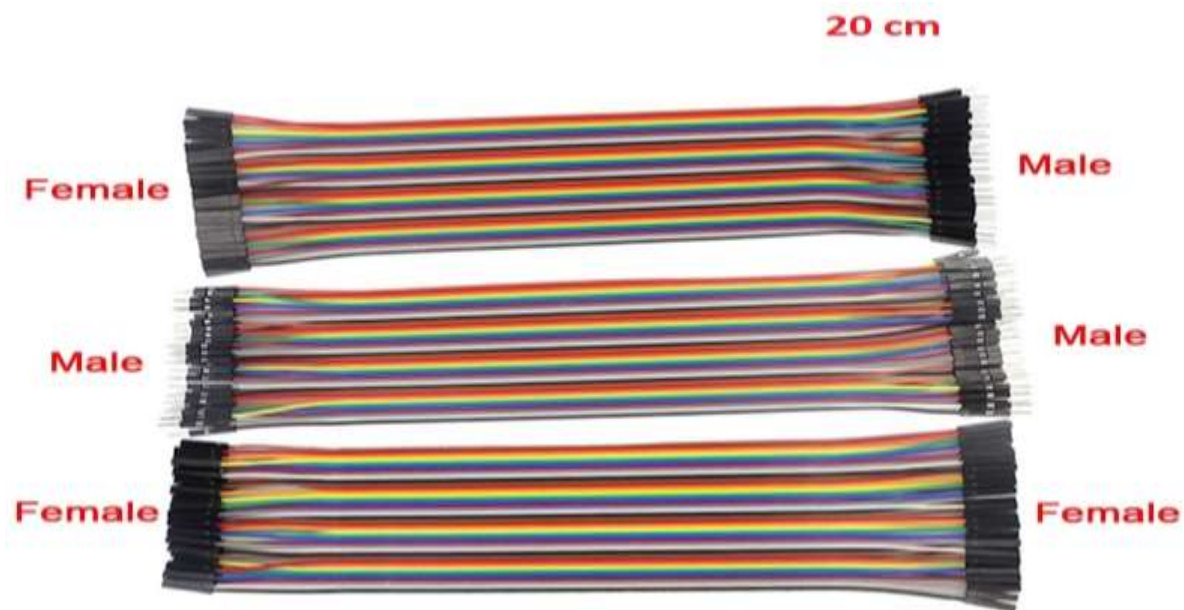
LED INDICATOR

- A LED indicator is a small light on your device that indicates the status of certain conditions.



JUMPING WIRES

- A jumper is a tiny metal connector that is used to close or open part of an electrical circuit. It may be used as an alternative to a dual in-line package (DIP) switch. A jumper has two or more connecting points, which regulate an electrical circuit board.



SOFTWARE USED

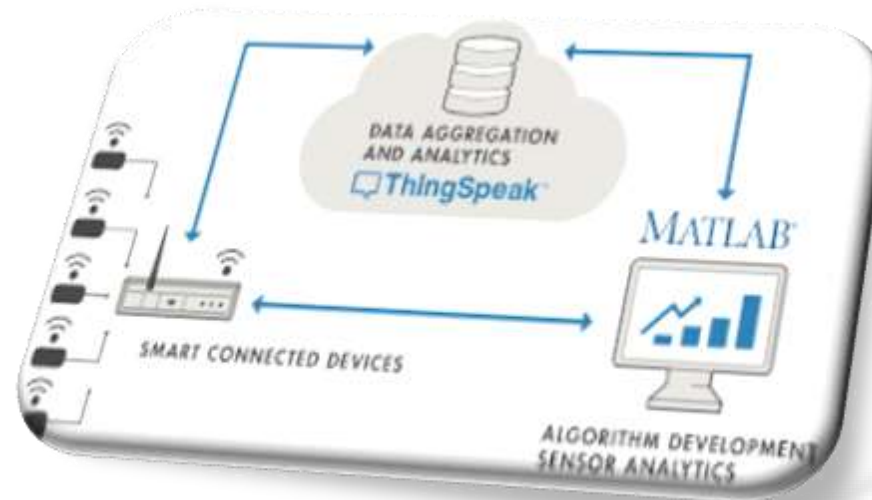
- ARDUINO INTEGRATED DEVELOPMENT ENVIRONMENT (IDE)
- MICROCONTROLLER PROGRAMMING LANGUAGE : EMBEDDED C
- IOT ONLINE OPEN SOURCE DEVELOPMENT PLATFORM(THING SPEAK)
- MATLAB



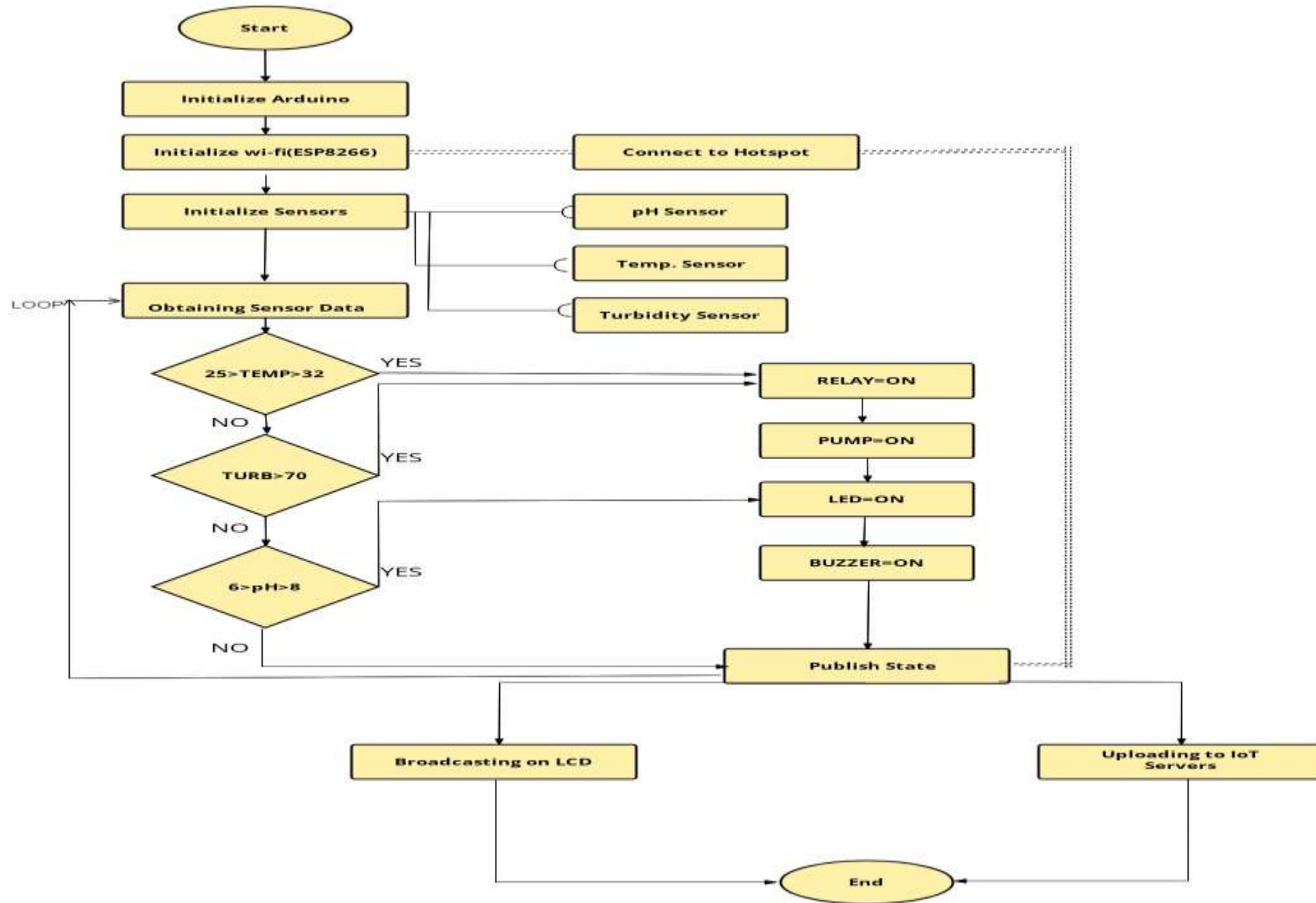
Arduino IDE



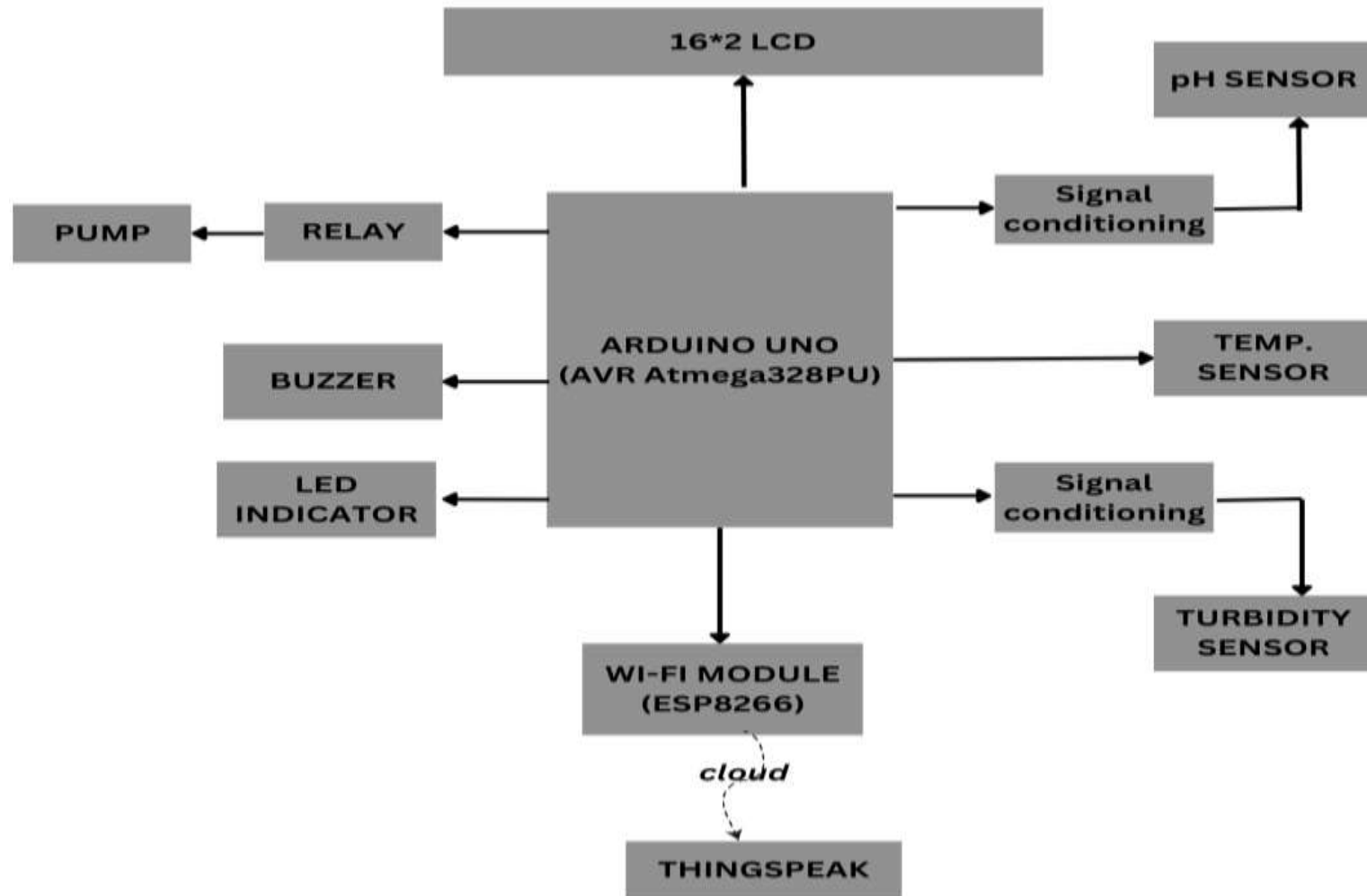
Embedded
C
Programming



FLOWCHART



BLOCK DIAGRAM



❑ Fish Farming Water Quality Parameters Classification-

➤ TURBIDITY:

less than 25 ::low turbidity
25 -100 ::medium turbidity
over 100 ::high turbidity

➤ PH:

most suitable :: 6 to 8

➤ TEMPERATURE:

most suitable ::25 to 32



RESULT

➤ pH



➤ TEMPERATURE



➤ TURBIDITY



BENEFITS

- Real time monitoring
- Automation and control
- Data driven insights
- Early detection of issues.
- Environmental sustainability
- Remote management and scalability

❑ Overall an IoT based aquaculture monitoring system can enhance productivity, efficiency, and sustainability in aquaculture operations by providing real-time insights, automation, and remote management capabilities.

FUTURE SCOPE

- Though we have created a system to control a demo aeration system.
- More actuators such as heating rods, fish feeder etc. will be integrated to this system.
- We will develop a better way to capture image and use better image processing techniques to provide better result
- .
- Further, we will also add a module which will suggest farmers about the nutrition values to be given to the species.

CONCLUSION

- This work designs and implements a unique aquaculture monitoring system based on IoT .
- This work finds a way to give a better results with low cost than other available system.
- Aquafarmers can avoid time consuming manual testing and thus, will help aquafarmers to produce more no. of fishes which will help to fulfill the demand for fishes in the market.
- It also helps to take necessary proactive measures before the damage is done.

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