Team

ALPHA

Nathanael Ng Hua Ern
Ng Lin Jie
Tan Jun Wei Gabriel Grantt

PROBLEM STATEMENT

Aquaculture requires the user to periodically monitor the pH, dissolved oxygen level, and temperature of the water to create an optimal environment for the aquatic life to thrive in. However, manual monitoring is labourious, time-consuming and requires attention from the users.

Furthermore, intervention might sometimes be too late should monitoring periods be too far apart, causing huge losses for the farmers. When they are away from the aquaculture, users have to live with the worry that the environment created for the aquatic life might be disrupted anytime

UNDERSTANDING THE COMMON MEASUREMENTS OF AQUACULTURE

pH Level

Without proper pH levels, aquatic life might die due to high toxicity

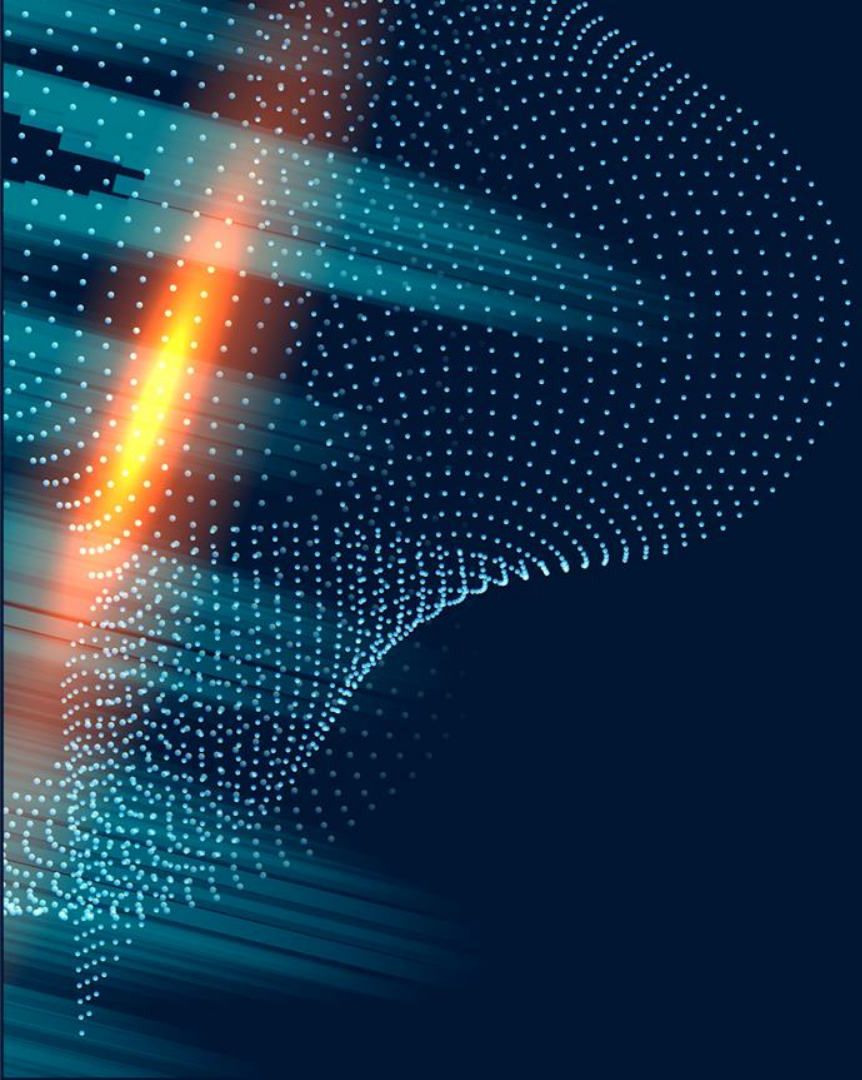
Oxygen Level

Inadequate oxygen level will cause oxygen stress in aquatic lives

The higher the temperature, the lower the oxygen

Temperature

Aquatic Lives are highly sensitive to temperature which may result in unnecessary stress and inhibit growth



Introducing

PONTUS

Real-Time Smart Aquaculture
Measurement System

What is PONTUS?

- The Pontus System is named after the ancient, pre-Olympian Greek God of Sea, Pontus.
- It automates the monitoring process in the aquaculture through cloud technology and Internet-Of-Things System. It measures the pH level, dissolved oxygen level and the temperature of the water in real-time and returns these measurements periodically. Should the measurements reach the threshold, the user will be notified promptly for timely intervention.
- This Smart Measurement Monitoring System for Aquaculture relieves the farmers from the laborious and time-consuming manual monitoring process through a low-cost yet effective system.

Key Features

Ease of Use

All you need is a mobile phone and Telegram to start off with Pontus!

24/7 Real-time Measurements

pH, Dissolved Oxygen and Temperature Measurements are fed into Pontus at your preferred intervals. Set your own threshold too!

Data at a Glance

Dashboard shows the different measurements and allows the users to download the data for analytics purposes

Real-Time Notifications with Telegram

Once the level exceeds the threshold, the user will receive a notification via Telegram Bots

Target Users

Hobbyist

Small Scale Commercial Farmers

Potential Market Size & Opportunity

The IoT in agriculture market size was valued at $ 16,330 million in 2017, and is projected to reach $48,714 million by 2025, growing at a CAGR of 14.7% from 2018 to 2025.

Retrieved from IoT in Agriculture Market Size, Share & Growth Analysis | Forecast 2025 (alliedmarketresearch.com)


•Ease of Access
•Cheap to Setup
•24/7 Data Available
•Save resources on monitoring
•Securities Vulnerabilities
•Connectivity and Power Disturbance
•Data Corruption
Strength
Weaknesses
Opportunities
Threats
•AI + Machine Learning for Prediction Model to regulate measurements during cyclical seasons
• Hackers
• Future IoT Competitors
• Labour Costs

Roadmap of PONTUS

Phase 0

- Design Thinking
- Role Delegation
- Discovering pain points
- Understanding Aquaculture

Phase 1

- Idea Finalisation
- Creating Website with HTML/CSS & BootStrap

Phase 2

- Procurement of Sensors
- Prototyping & Tinkering
- Integration of Hardware & Software

Phase 3

- Minimum Viable Product

Bills of Materials

Product Name	Quantity Type	Cost
ESP32	1	$10.45
pH level sensor	1	$39.50
DO sensor	1	$169
Waterproof Temperature Sensor	1	$12
Jumper Wires	1	$10
Breadboard	1	$4.55
	Total Cost	$245.50

User Interface

Showcase of PONTUS Prototype


PLEASE STAND BY
325
50
575
300
35
45
30
20

Thank you

Connect with us on LinkedIn

Nathaniel Ng Hua Ern

Ng Lin Jie

Tan Jun Wei Gabriel Grantt