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Team 7 Proposal for IoT Dataset and Application

1. What is the source of your dataset?

The dataset used for this project is from the study, "Real-time evaluation of water quality for aquaculture applications"

(<https://www.sciencedirect.com/science/article/pii/S2352340920313391#bib0001>). The data is publicly available on Mendeley Data

(<https://data.mendeley.com/datasets/34rczh25kc/4>)

2. How was the data collected?

The data was collected using an IoT-based water quality monitoring system for aquaculture. Sensors were deployed at two depths (30 cm and 60 cm) in a controlled aquaculture environment to measure key parameters at regular intervals. The system recorded real-time data relevant to water quality assessment and aquaculture management.

3. How many observations are in the dataset?

Each dataset (30 cm and 60 cm depths) contains 9,623 observations, resulting in a total of 19,246 observations across the two datasets.

4. What variables are in the dataset?

30 cm Dataset:

Date and Time

Temperature (°C): Water temperature at 30 cm depth.

pH: Acidity or alkalinity of the water.

Turbidity (NTU): Water clarity, measured in nephelometric turbidity units.

60 cm Dataset:

Date and Time

Temperature (°C): Water temperature at 60 cm depth.

Turbidity (NTU): Water clarity, measured in nephelometric turbidity units.

5. What is your IoT application/system? Who will use it?

Our IoT application is a Smart Aquaculture Water Quality Monitoring and Control System. This system will:

- Monitor water temperature, pH, and turbidity in real-time.
- Provide automated alerts when parameters deviate from optimal ranges for aquatic life.
- Predict future water quality trends using machine learning which can enable proactive maintenance.

- Integrate with actuators to control heaters, aerators, and filtration systems for temperature, oxygen, and clarity management. However, this integration may need to incorporate simulated data from those sensors for use in this project.
- The primary users are aquaculture operators, researchers, and environmental agencies seeking to optimize water quality, ensure sustainability, and prevent adverse conditions in aquaculture systems.

6. What industry does your IoT application/system fit into?

This IoT application fits into the Industrial IoT sector, specifically within the aquaculture industry. It focuses on enhancing water quality monitoring and management for improved productivity and sustainability in aquaculture operations.