Agar cultivation monitoring

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Technical report

This report details the development of a monitoring system for Microorganisms:

Hardware section:

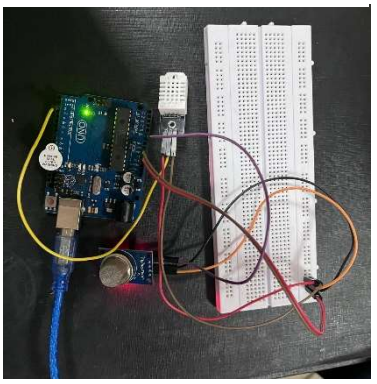
The system is designed to be suitable for the survival of mycelium fungus by measuring temperature, humidity, and CO2 concentration using 2 sensors which are DHT22 for temperature and humidity, and MQ-135 sensors for CO2 concentration.

The connections of the sensors can be shown in Fig (1).

- **The DHT 22 sensor** will be utilized to measure humidity and temperature.
- **The MQ 135 sensor** will be utilized to measure CO2 concentration.
- **The buzzer** will be activated when the threshold for the temperature and humidity has been reached.

Figure 1:

Sensors connections



It was concluded that the relation between temperature and humidity is an inverse relation.

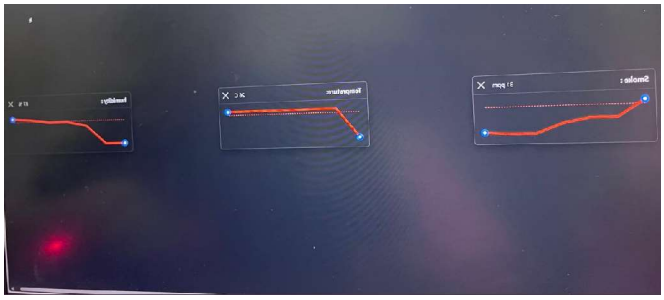
Software section:

The programming languages for the system are JavaScript and python.

The system contains two main parts: the front-end which is the dashboard which is made by libraries such as React and React bootstrap that can be shown in Fig (2).

Figure 2:

Dashboard readings

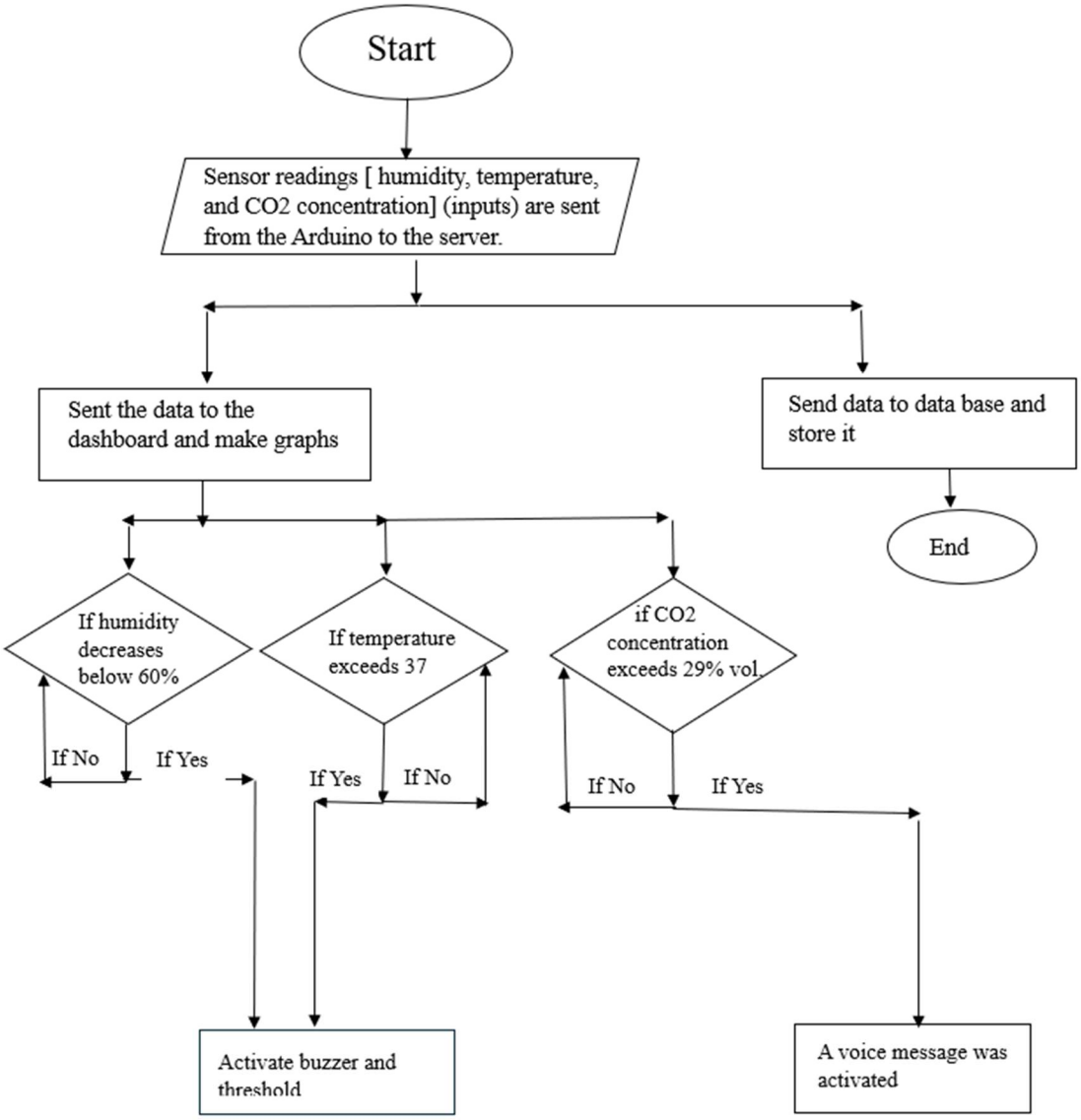


The backend, which is the server and the database, the server is made by an Express Library, while Sequelize is used to make the database.

Node serial port is used to connect between the Arduino and the Server, and Socket.IO is used to connect between the server and the dashboard.

Figure 3:

Flowchart



Note: Figure 3 indicates the flowchart summarizes the action of each sensor and the alert system.