2023-2-19 first meeting

Creating GitHub project file to discuss the required features for our smart aquarium.

Feature modules:

1.Water temperature control

Components: Temperature sensor, heater with driver

Logic: IO port collects temperature sensor data, compares it with the set value, uses the difference for PWM control, and controls the heater

Algorithm: Available filtering for data collection, PID control for temperature control

Indication: A red light indicates when the heater is on, a green light indicates when the set temperature is reached, and an alarm will sound if the set temperature is not reached for an extended period.

2.Oxygen content control

Components: Water dissolved oxygen sensor, pump with driver

Logic: IO port collects water dissolved oxygen sensor data, compares it with the set value, uses the difference for PWM control, and controls the pump

Algorithm: Available filtering for data collection, PID control for oxygen control

Indication: An alarm will sound if the oxygen content is too low for an extended period.

3.Feeding system

Components: Servo, optoelectronic sensor

Logic: Controls the rotation of the servo to control the amount of food, optoelectronic sensors detect any remaining food.

Algorithm: Mechanical structure

4.Water quality control

Components: Turbidity sensor

Logic: IO port collects water dissolved oxygen and turbidity sensor data, uses it as a reference variable for water pump control.

Algorithm: Available filtering for data collection

Indication: An alarm will sound if the water quality is not up to the set standard for an extended period.

5.Flow rate control

Components: Water flow rate sensor, pump with driver

Logic: IO port collects water flow rate sensor data, compares it with the set value, uses the difference for PWM control, and controls the water pump

Algorithm: Available filtering for data collection

6.Lighting effect

Components:

Logic:

Algorithm:

Due to the Raspberry Pi provided by the school being unable to connect to Bluetooth and its slow processing speed making it difficult to operate, we are seeking ways to purchase the latest generation of Raspberry Pi. Eventually, we discovered that it was not possible to buy one at a reasonable price in the UK, so we purchased a Raspberry Pi from China. This also allowed us to buy components at a lower price from China.