

ECE 153B  
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# Project Proposal

## Overview

The aim of this project is to develop a smart fish tank that can automate the feeding process and monitor water temperature to ensure the well-being of fish. The proposed system will use temperature sensors, microcontrollers, and motors to automate the feeding process and monitor the water temperature. The smart fish tank will also support bluetooth to enable the user to control and monitor the system remotely.

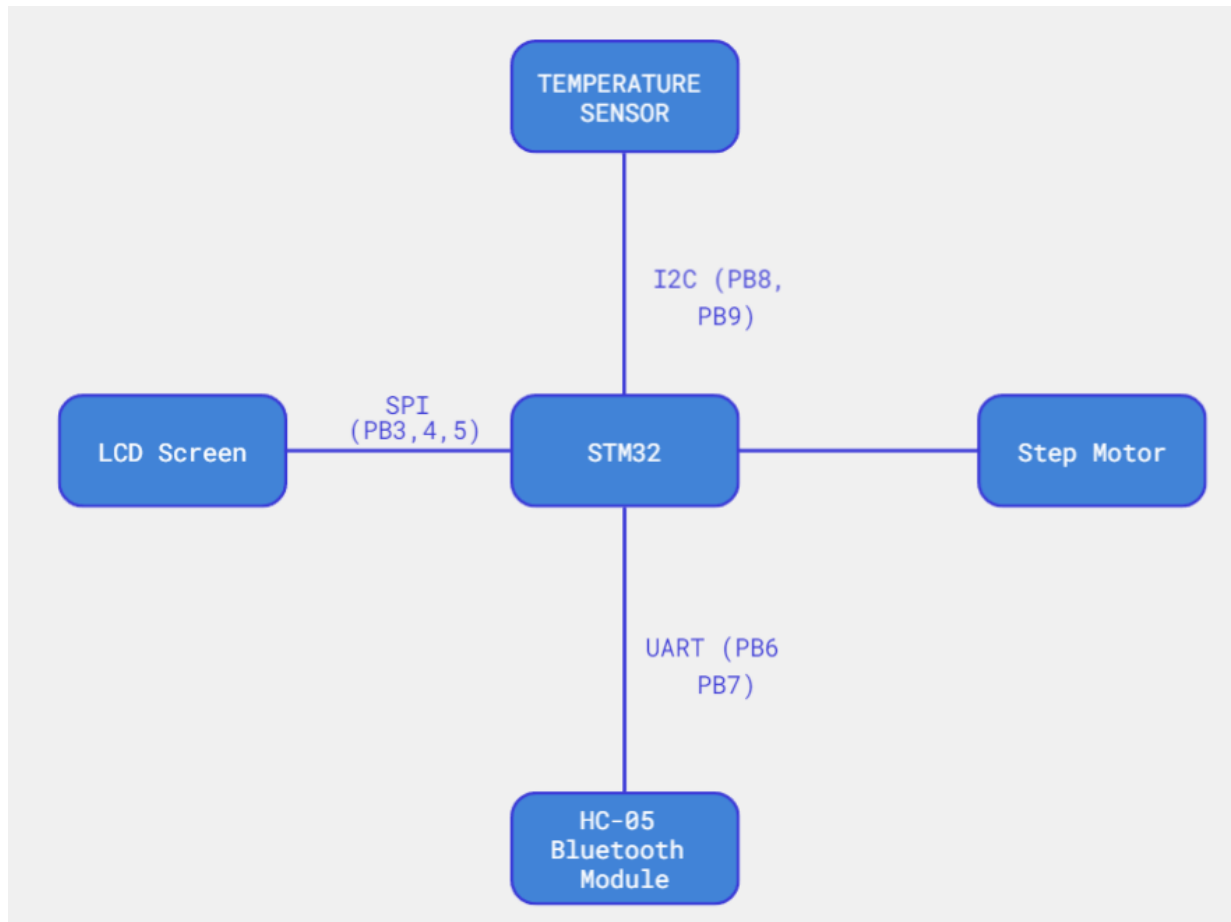
## Peripherals

Temperature sensor  
HC-05 Bluetooth Module  
Motor  
LCD

## Protocols

UART  
I2C  
SPI

## Block Diagram



## Responsibility

Yufei will configure Step Motor and Temperature Sensor.

Yubin will configure the Bluetooth Module and LCD display.

## Software Structure

We will use GPIO PB6 and PB7 as USART transmit and receive pins to connect with bluetooth. When it receives command from the user, it will return the current water temperature or feed the fish.

We will use GPIO PB8 and PB9 for I2C SCL and SDA lines to interact with the temperature sensor. When the temperature detects abnormal temperature, it will generate an interrupt to alarm the user via bluetooth.

We will use PWM to generate a pulse in a fixed time interval, and use it to control the motor, which releases fish food.

## Goal

1. Design and build the tank and install the temperature sensors and mechanical device to feed fish.
2. Set a timer to feed fish every a fixed amount of time by rotating the mechanical device using a motor.
3. Integrate sensors to monitor water temperature and program the microcontroller to send alerts if the temperature is outside the acceptable range.
4. Send instruction via Bluetooth to feed fish or check water temperature

## Website

<https://sites.google.com/view/smart-fish-tank/home>