Embedded System Lab

Final Project (Spring 2022)

Internet of Thing - Smart Greenhouse

By

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Members

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Presented To

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Project Overview

Project Name

Smart Green House

Description of the project

        IoT system to control water in the plant and turn on the light automatically depending on temperature, soil moisture and light using various sensors with STM and ESP boards.

Sensor/Equipment Used in the Projects

1. Light Intensity Sensor (BH1750)

2. Digital temperature sensor (DS18B20)

3. Soil Moisture Sensor Module

4. STM32 Board

5. ESP8266 NodeMCU V3

6. Relay 5 V.

7. Water Pump

8. Light Bulb

Remarks

We use Firebase as our cloud service.

My Resources

https://github.com/TeerapatChan/Embedded-System-Project

Responsibilities - Tayanon Nuntiya

Role : Embedded System Development & System Architecture

- NodeMCU ESP8266
  - Connection with STM
  - Connection with cloud (Firebase)
  - Pull sensor data from the STM to control the Pump and light bulb.
  - Programmed water and light control

- Cloud (Firebase)
  - Setting up realtime database
  - Push sensor data received from STM to firebase via UART

- System Architecture
  - Design feature and architecture components
  - Planning how each components will work with each other

Responsibilities - Yatawee Boonpeng

Role : Embedded System Development & Team Management

- Project Manager
    - Schedule a meeting
    - Asking teammates for updates
    - Prepare equipment for project
    - Making Discord group to easier management

- STM
    - Connect circuitry and programmed stm32 to read value from Sensors (BH1750, DS18B20, Soil moisture Sensor) and send through UART

- NodeMCU ESP8266
    - Connection with STM
    - Connection with cloud (Firebase)

- Integrate the invention

Responsibilities - Teerapat Chantaramanee

Role : Embedded System Development & UX/UI Designer and Development

- NodeMCU ESP8266
  - ○ Connection with STM
  - ○ Connection with cloud (Firebase)
  - ○ Pull sensor data from the STM to control the water pump and light bulb.
  - ○ Programmed water and light control

- STM
  - ○ Find useful information to connect the sensors
  - ○ Connect circuitry and programmed stm32 to read value from Sensors (BH1750, DS18B20, Soil moisture

Sensor) and send through UART

- UI/UX Designer and Development
  - ○ Design first look of website using Figma
 - ○ Design how User will interact with Web App

- Integrate the invention

Responsibilities - Sirivimol Saiyued

Role : System Architecture & UX/UI Designer and Development

- NodeMCU ESP8266
  - Connection with cloud (Firebase)
  - Pull sensor data from the STM to control the Pump and light

- System Architecture
  - Design feature and architecture components
  - Planning how each components will work with each other

- UI/UX Designer and Development
  - Design how User will interact with Web App
  - Create Web App using React
  - Connect Web App to Firebase
  - Deploy Wep App

System Structure
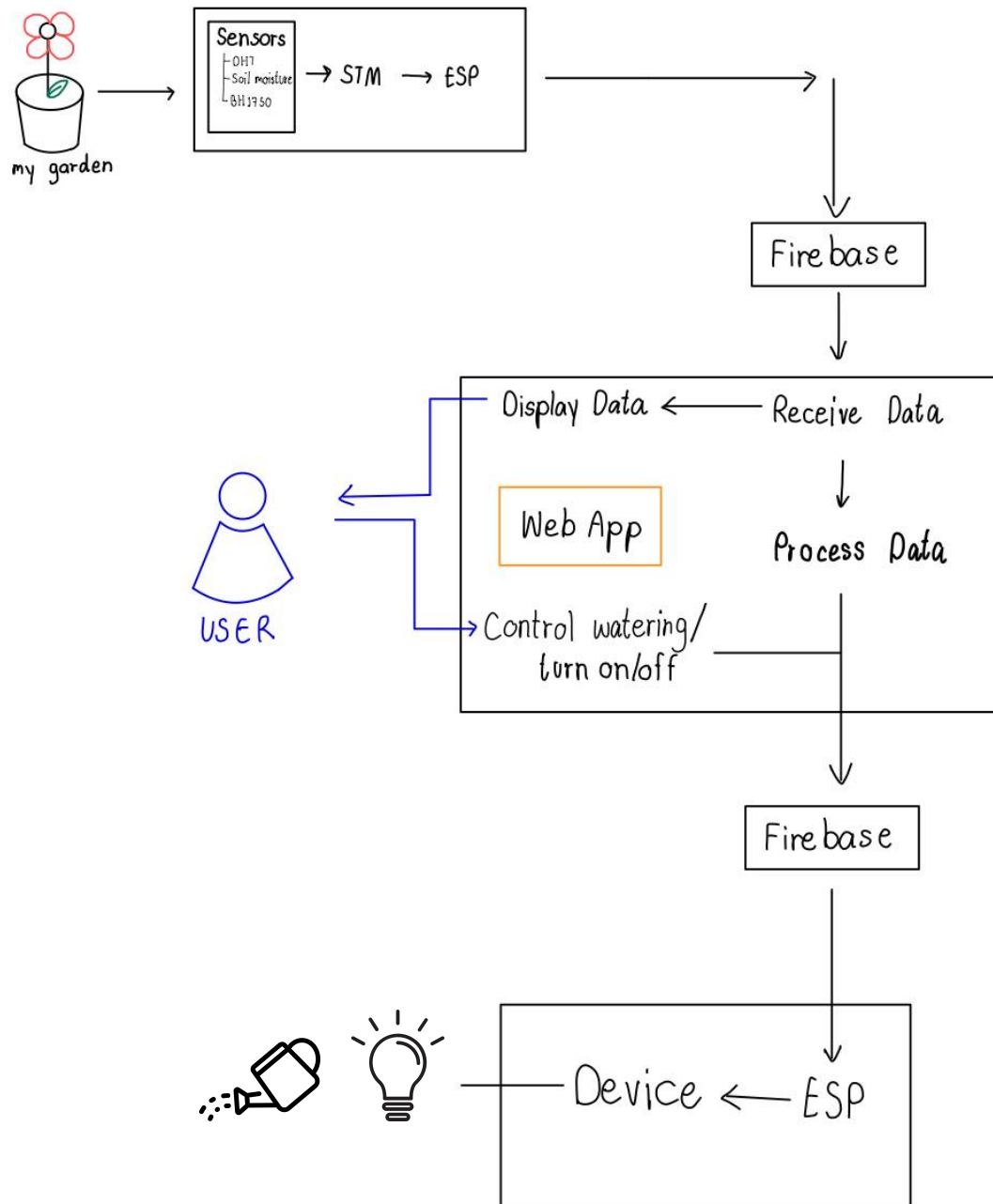
1. Sensor Board : Gather data from sensor and sent to Firebase

2. Web App : Received data from Sensor Board, interact with user and control light on/off and water the plant by Firebase

3. Device Board : Received the data from Firebase and control the device

Web App

● Display Data from sensors from Firebase Database

- Data will update automatically

- Latest Update time will be displayed

- Data from sensors are following

  - Temperature in Celsius Degree (100% (25 C))

  - Soil Moisture in Percentage (100%)

  - Light in Percentage (100% (5000 lux))

- Manual Mode to control light on and water the plant

  - ON : You can manually control turn on the light and water the plant by click on the button

  - OFF : You can manually control turn off the light and stop water the plant by click on the button

- Auto Mode to water the plant

  - Watering the plant will be controlled by the data from sensors