CSCI 4287: EMBEDDED SYSTEMS

FINAL PROJECT

APRIL 26, 2023

HOME AUTOMATION

Team Name: WannaBe Engineers

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PRESENTATION HIGHLIGHTS

FOCUS AREAS

- Project Motivation
- Project Description
  - Components & Features
- Demo
- Challenges
- Discussion

MOTIVATION

- Increase home comfort and convenience through automation.
- Ensure efficient watering of plants with a smart irrigation system.
- Enhance home security with a motion sensor.
- Improve lighting control and ambiance with smart LED and RGB lights.
- Create a customized home automation system that meets specific needs and preferences.

DESCRIPTION

- Utilizing Arduino as the microcontroller for the system.
- The ESP is utilized to connect the Arduino with mobile using the RemoteXY UI library.
- Integration of smart LED and RGB LED, enabling remote control through mobile devices.
- Implementation of a home intrusion system, featuring motion detection and display of messages.
- An automatic irrigation system is incorporated into the overall design using moisture, a water level sensor, and a water pumping motor.
- Constant display of thermometer reading on an LCD screen using timer interrupt to display every 3 seconds.

COMPONENTS & FEATURES

SMART LED & TEMPERATURE READING

- Normal and RGB LEDs
- Thermistor
- LCD Display
- Timer Interrupt for Temperature reading

HOME INTRUSION SYSTEM

- PIR Sensor

SMART IRRIGATION SYSTEM

- Soil Moisture Sensor
- Water Level Sensor
- Mini water pump with small pipe
- 5V Relay module
- I2C Module
- AA Battery and Battery Holder

ESP 32 REMOTEXY LIBRARY

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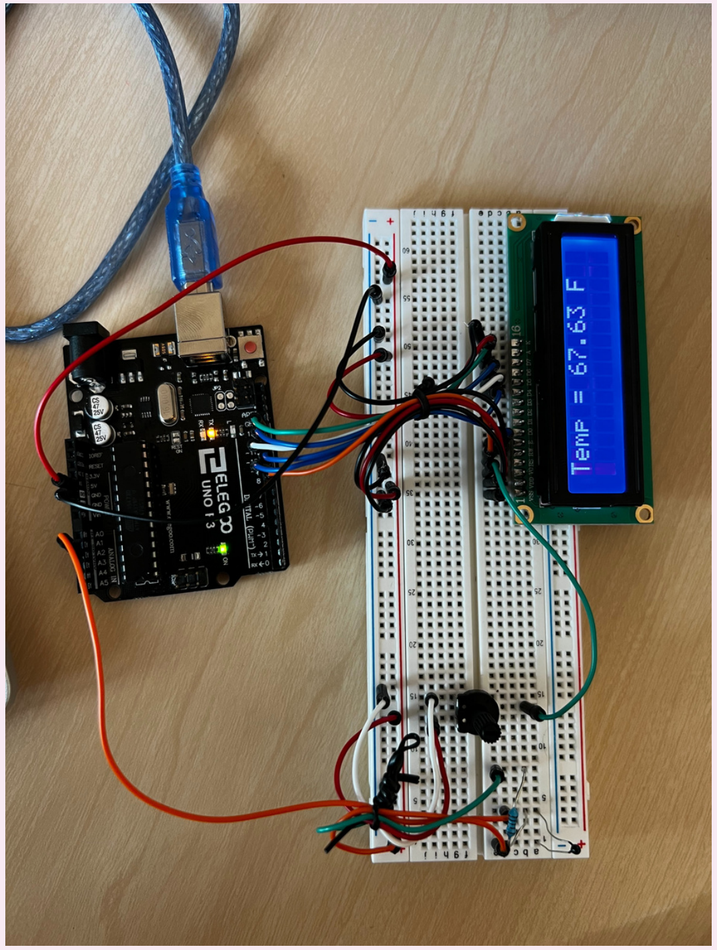
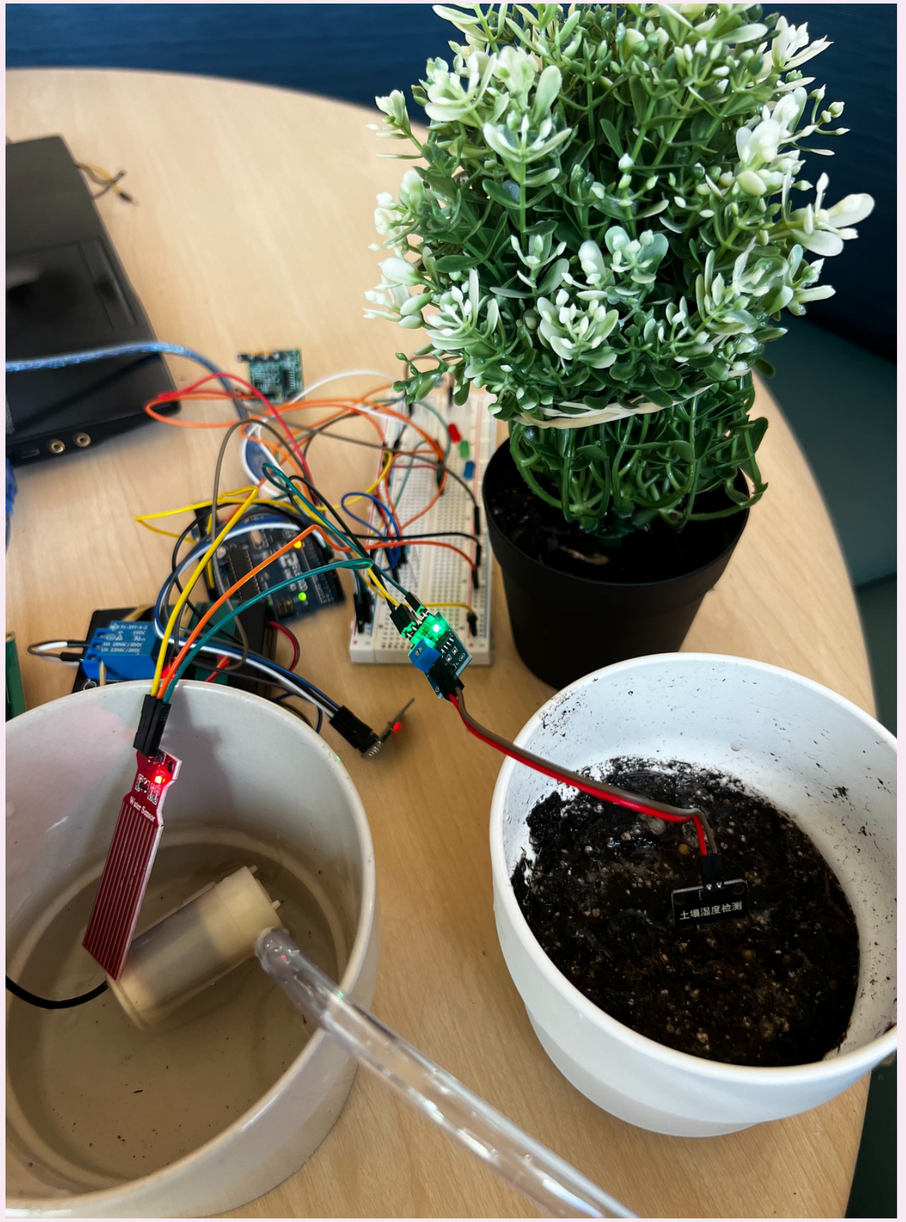


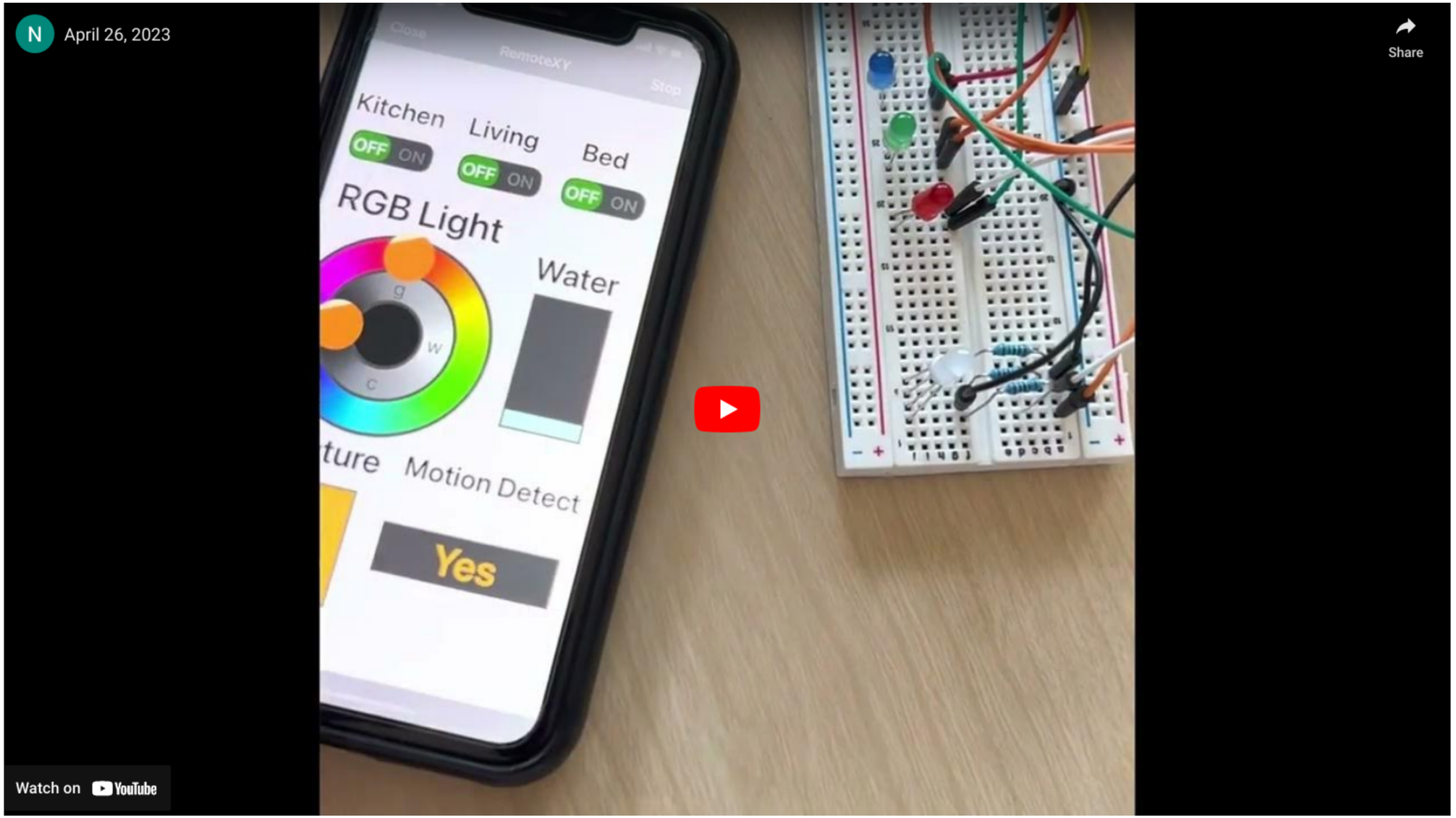


OVERALL SYSTEMS SETUP

- Smart LED
- Home Intrusion System
- Room Temperature reading
- Smart Irrigation System

DEMO

Link to the Video : https://www.youtube.com/watch?v=W_zp3WBXHus



CHALLENGES

- High power consumption of the water pump has resulted in intermittent ESP connection issues with the Arduino.
- The use of TX and RX pins by the ESP module prevents two Arduinos from functioning simultaneously.
- Irregular transmission of water level sensor readings to the ESP module.

ANY QUESTIONS?

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