CPE 301, Section 1102

Final Project – Swamp Cooler

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Project overview:

The objective of this lab is to create an evaporation cooling system, based on the previous labs we have done so far (GPIO, ADC, Timers, and UART). To build this, we need to monitor the water level and display the air temperature and humidity on the LCD screen. When the water is too low, the red LED in the circuit should light up. When the water fulfils the requirements, the blue LED should turn on along with the fan motor when the temperature is out of the desired range. We are also required to turn on/off the button of the system as a user desires when to use it. The power requirement of the fan, is as the fan motor requires, 3-6 V to make it spin.

State and LED conditions:

At all states: realtime clock is used to report the time of each state

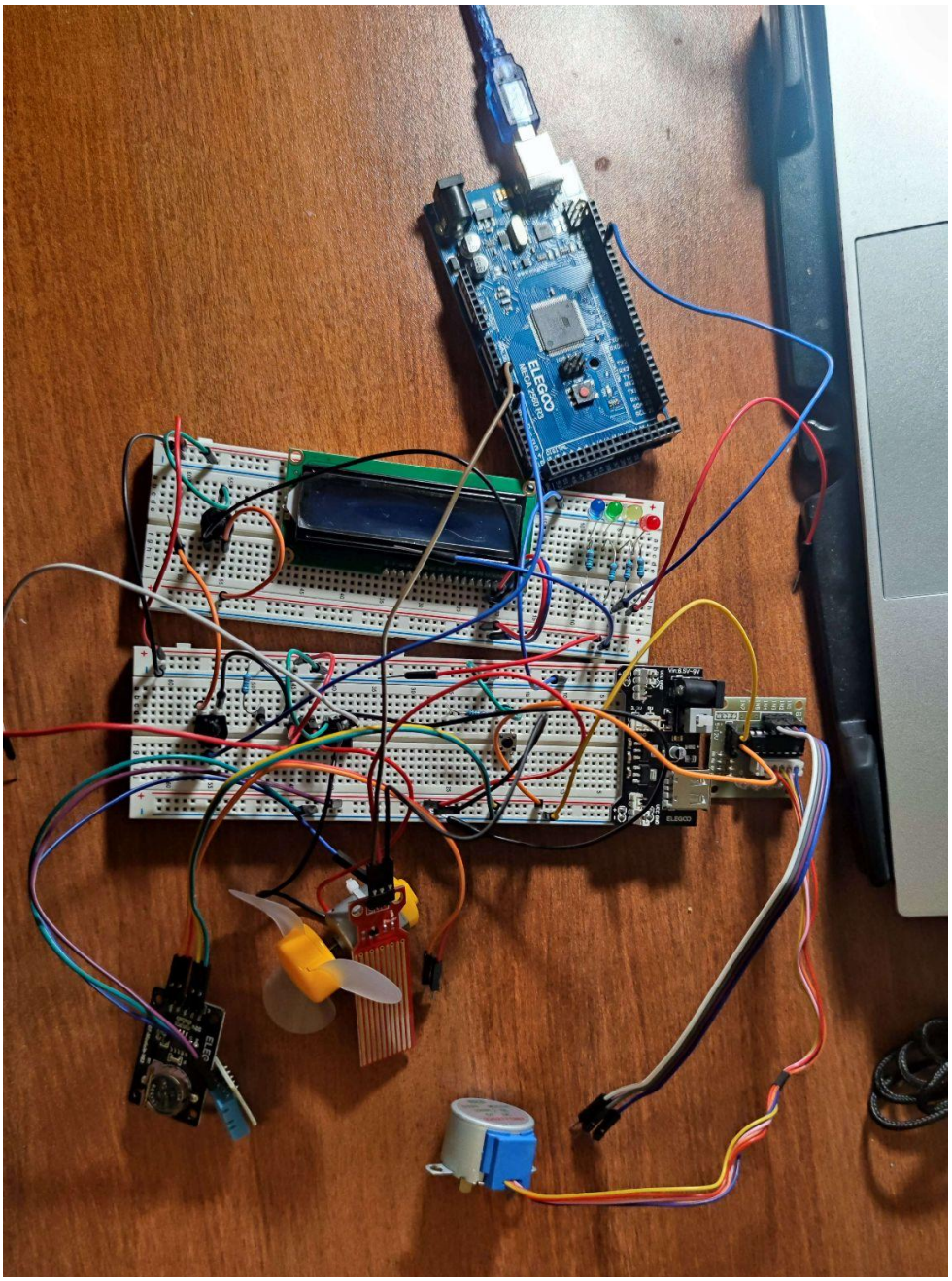
All states except disabled: Humidity and temperature are monitored, the stop button should turn the fan motor off and go to a disabled state

- At disabled state: yellow LED is on, and no monitoring should happen
- At idle state: green LED is on, records transition time and water level
- At error state: red LED is on, error message displayed on LDC, and motor is off
- At running state: blue LED is on, fan motor is on, goes to idle state if temperature drops below threshold and goes to error if the water level is too low

Materials used for this project:

- Breadboard
- Arduino ATmega2560
- Jumper kits
- Computer/laptop with downloaded Arduino IDE
- Water Level Detection Sensor Module
- Fan Blade and 3-6V Motor
- DHT11 Temp and Humidity Module
- DS1307 RTC Module
- Power Supply Module
- LCD1602 Module
- Female-to-Male Dupont Wire
- USB cable
- Potentiometer 10k
- L293D
- Stepper Motor
- ULN2003 Stepper Motor Driver Module
- 330 ohm resistors

Picture of the final system:



Link to the video:

CPE301_FinalProjectVideo_Derrel and Ezra.mp4

Link to the github:

https://github.com/CPE301-FinalProject-Derrel-Ezra/Final-Project-Derrel-Ezra.git

Picture of the Schematic: