CPE 301 Final Project Summary

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GitHub Repository: https://github.com/1105-Braum-Tristan/Swamp-Cooler-301-Final.git

Components:

- Arduino Atmega 2560
- Breadboard
- Various Jumper Cables
- USB Cable
- Fan Blade
- 3.6 V Motor
- DHT 11 Temperature and Humidity Module
- Power Supply Module
- Green LED
- Yellow LED
- Red LED
- Various Resistors
- Liquid Crystal Display (LCD)
- Water Level Detection Sensor Module
- Potentiometer

Operation:

The cooler runs with the fan motor on until the temperature drops below the set temperature threshold of 24 Celsius during normal operation. Once the threshold is reached, the system is set to idle. While the cooler is idle, the water level will continue to be monitored, and an error state reached of the water drops below the required water level threshold. The disabled state is reached when the system is brought to a completed stop, no monitoring of humidity, temperature, or other data occurs. The LEDs on the breadboard reflect the current state of the cooler. Each color represents a different state. They are as follows:

- Blue (Running)
- Green (Idle)
- Yellow (Disabled)
- Red (Error)

The current temperature and humidity of the system are monitored and displayed on the LCD. When an error occurs the corresponding error message will be displayed on the LCD.

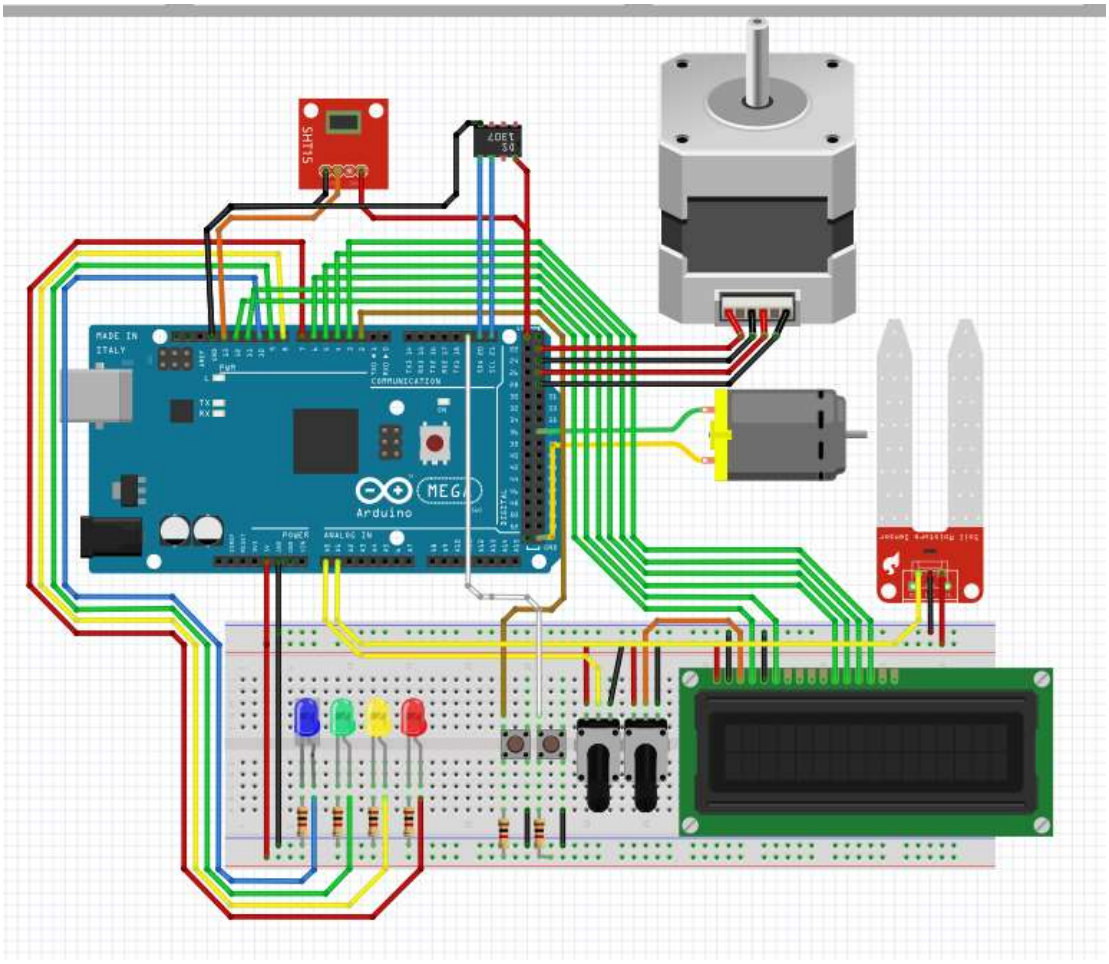
Challenges

Along the lines of what we were unable to get to function properly were the DHT11 module, Liquid Crystal Display, and ISR buttons. However, we do have the code that supports the efforts we made to make all of these components work. Because of this, we are unable to reach a disabled state since the buttons are not functional.

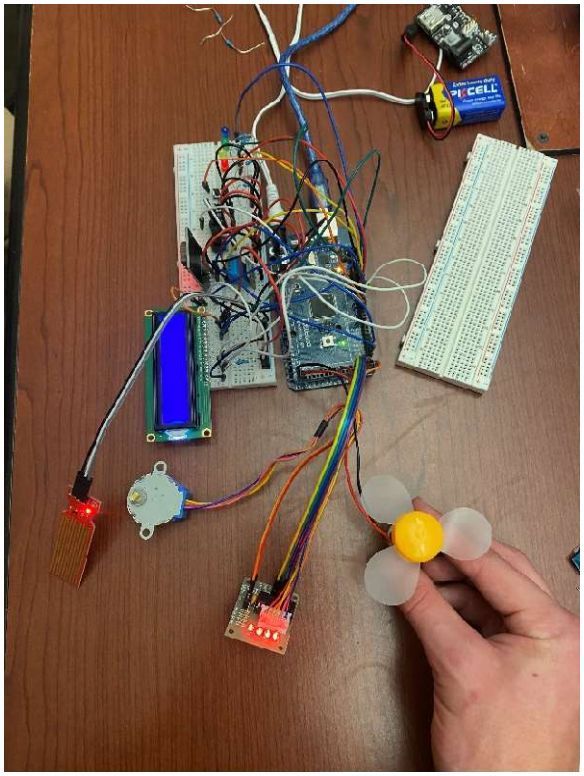
System Constraints:

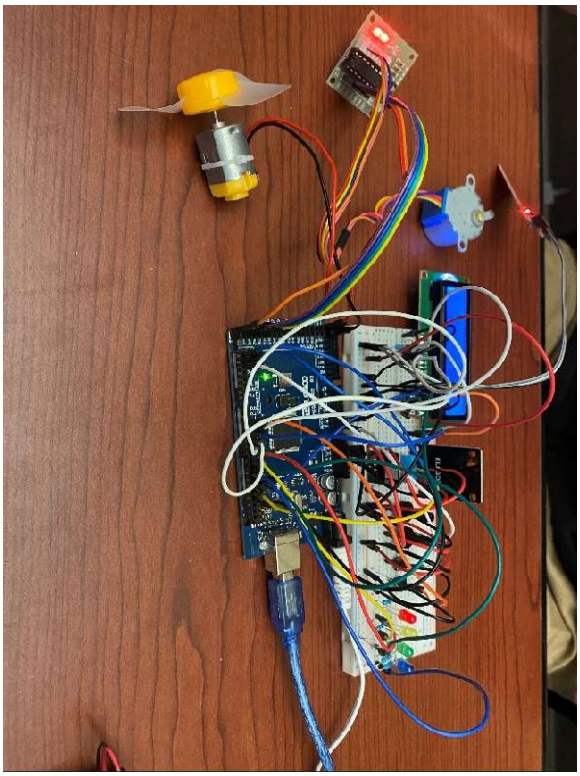
- Water Level
  - Water level value may not go below 120
- Temperature
  - Must be set above 24 Celsius to activate
- Components Fragile, handle with care
- Operation not possible in freezing or boiling environments or if water is in a plasma state (environment MUST allow for water be in liquid form)
- External Power Supply required to run 3.6 V motor attached to fan

Circuit Schematic:



Circuit Pictures:





Video Demonstration:

- https://youtu.be/QtcKbRp-ZnM

Documentation Sources:

- Arduino Atmega 2560 Datasheet
- Stepper Motor Documentation
- LCD Documentation
- DHT Documentation
- Water Level Sensor Module Documentation
- RTC Library Documentation