

Final project report - Julian Hurley

My partner is Hunter Anderson, group 36.

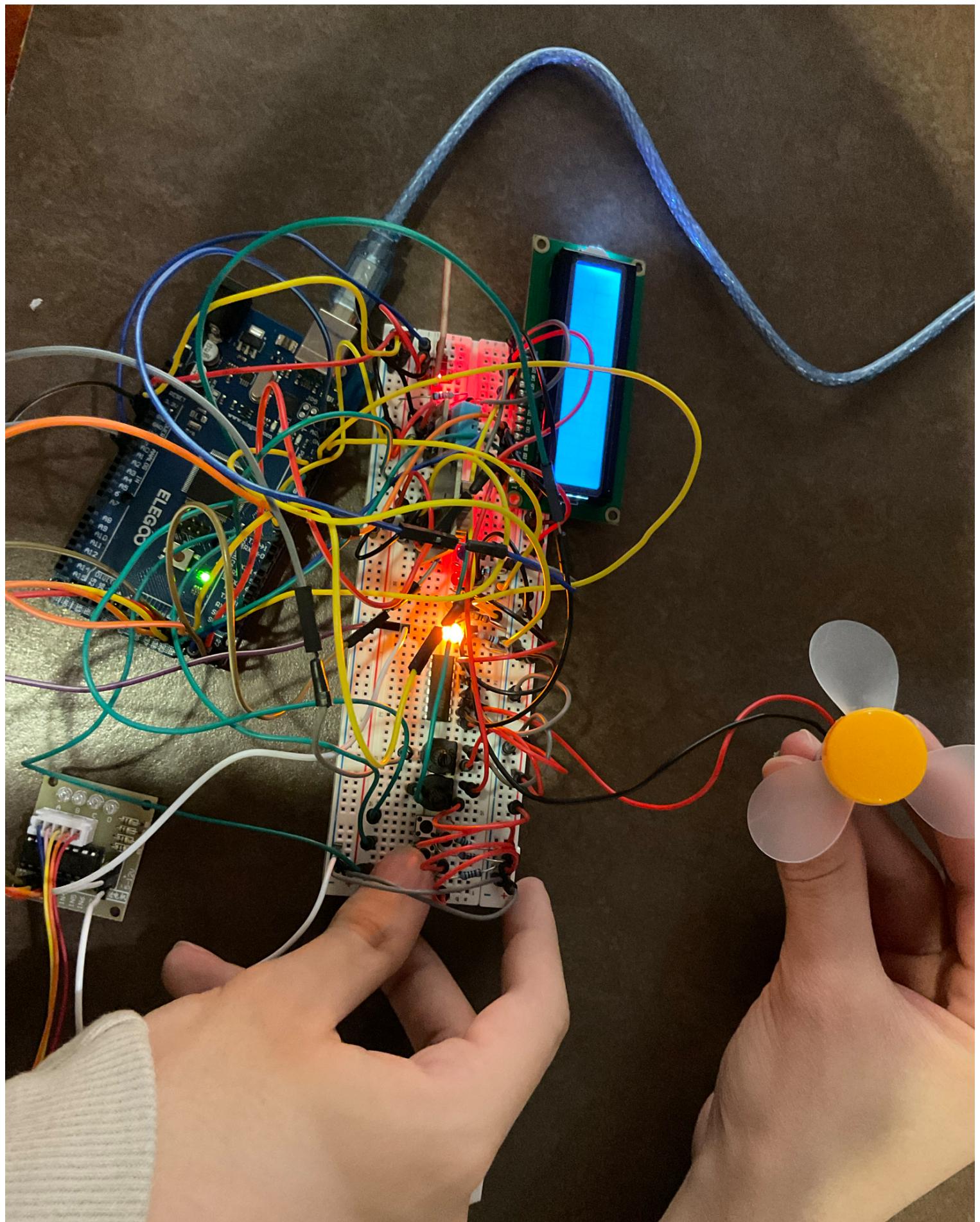
Our project has all components and functionality necessary for a fully-featured swamp cooler. It has a 3 state system consisting of active, idle, and error. Active and idle states are active only when there is no error triggering the error state. Active means the temperature and humidity sensor are above the threshold for cooling.

In its active state, the green LED lights up, the temperature and humidity sensors are recording and periodically updating on the LED screen, and the fan motor blows. In idle, the fan motor is still and the yellow LED is illuminated. In error state, nothing is activated and the red LED is illuminated. In any state, the user can move potentiometers to change the display brightness or vent angle.

The components used are an H bridge IC to power the fan motor, the power boards to power the vent motor, the vent motor itself, which angles the direction of the cooled output air, 3 buttons to change from start, idle, and reset states, a moisture sensor, a temperature/humidity sensor, a real-time clock, 3 colored LEDs, and LED backlit LCD screen, and the arduino to interface the components with the logic of our program.

Functionality depends on the state of the system. When in the active state, the moisture sensor is detecting that the water pan isn't dry, the temperature/humidity sensor readings are displayed on the screen every minute, and the fan is active or off depending on the temperature and humidity detected. Every time the fan switches on or off, the time and state change is logged. The idle state occurs when the detected temperature is below a threshold, or after resetting from the error (disabled) state. In the idle state the fan will not be spinning but all other functionalities will remain active. The error state only occurs when the water level is below the threshold, indicating there's no water left in the evaporative system, meaning it won't function properly. This stops the fan and all other functionalities to save power and prevent damage. It will also display an error message on the LCD screen that the water level is too low.

The power needed for the system is provided by the arduino's USB connection and the motor boards 5V output. The operating temperature minimum and maximum are constrained by the highest minimum and lowest maximum of any of the components.



(Assume all components are also connected to power and ground)

