

Colter Niemann,

Jacob Hunter

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CPE 301 Final Project

Design & Constraints:

In this project, we were tasked to design an evaporation cooling system which relied upon temperature and humidity settings, using the Arduino 2560 and sensors from the Arduino kit. The swamp cooler monitors water levels and prints an alert when water level is too low, monitors and displays the current air temperature and humidity on an LCD screen, allows user to control the angle of an output vent, and allows the user to enable or disable the system with a button.

The system is a state based system with 4 states. The first state is disabled, represented by a lit yellow LED. In disabled state, the LCD displays nothing, the vent is not moving and the fan does not operate. Next is idle state, where the system displays a green light, and the vent can be adjusted but the fan does not move. Additionally, the LCD displays the temperature and humidity of the surroundings. The system is in idle state when the temperature of the room is below 23 degrees Celcius. Third, is the running state, represented by a blue LED light. In idle state, the vent can be adjusted, temperature and humidity can be viewed, and the fan should run. The system should remain in running state until the temperature drops below 23 degrees Celcius, when it will go into idle mode. The user is able to switch into disabled state at any moment by pressing the control button.

In our specific circuit, the DC motor used for the fan completely stopped working. We tried testing the fan in a separate sketch, pulled directly from the lecture slides, and once it did not run, we resolved that the fan was out of operation. Otherwise, the project went very well and we were able to get all other functions of the system to work flawlessly, as shown in the video demonstration. All relevant information to the system can be found below. One other thing to note is that we had power supply issues, so we used a power supply module to power the dc motor as well as the LCD screen.

Video Link:

<https://youtu.be/-OhkKvZ2LDA>

Relevant Links:

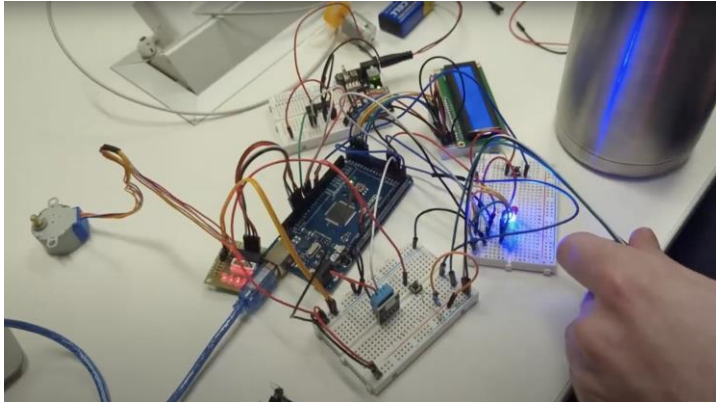
<https://docs.arduino.cc/hacking/hardware/PinMapping2560>

https://ww1.microchip.com/downloads/en/devicedoc/atmel-2549-8-bit-avr-microcontroller-atmega640-1280-1281-2560-2561_datasheet.pdf

<https://www.electronicshub.org/wp-content/uploads/2021/01/Arduino-Mega-Pinout.jpg>

<https://4.bp.blogspot.com/-Sj4AEX-ndNo/UeqPDIJo3DI/AAAAAAAAAJN4/uN5tE84jGPI/s1600/MEGA2560.jpg>

Pictures:



Github Repository Link:

<https://github.com/jacobghunter/CPE301-Final>

Schematic:

