CPE 301 Final Project

Swamp Cooler

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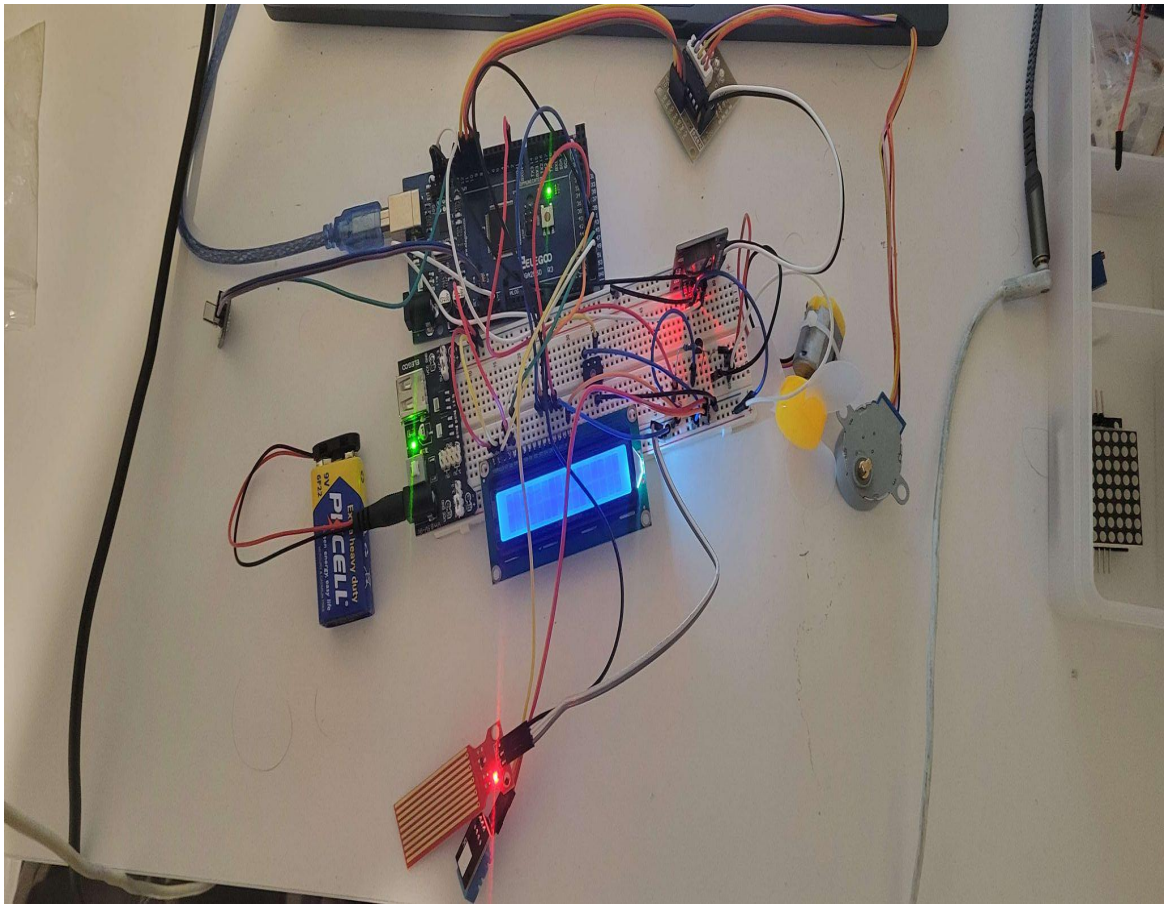
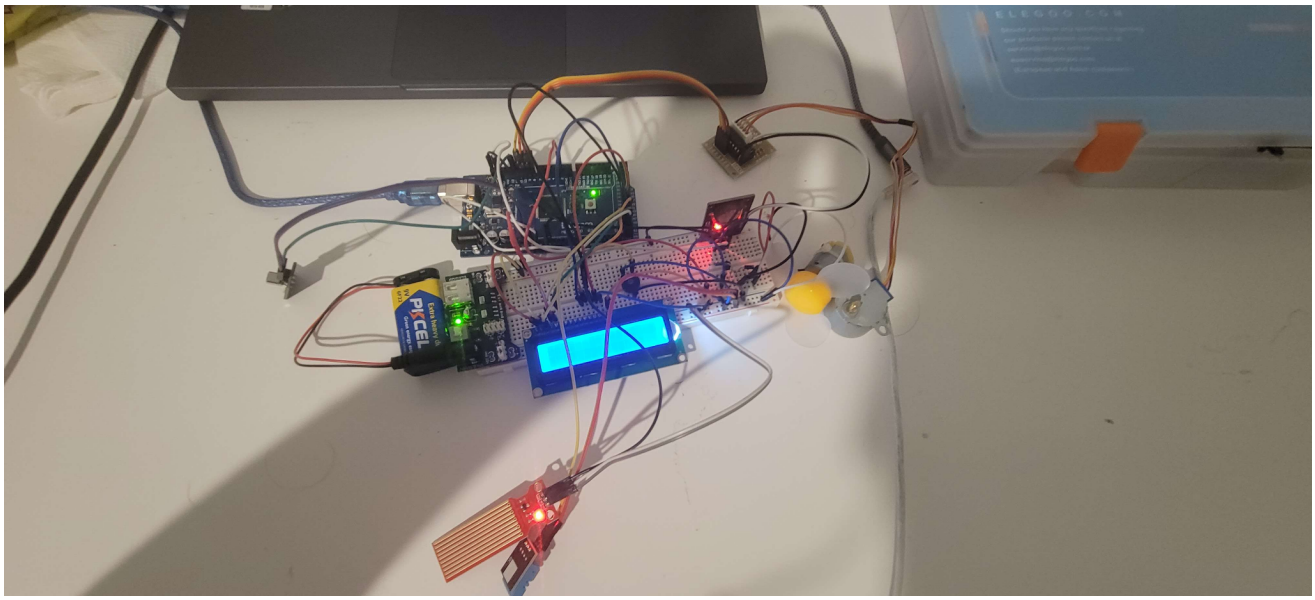
Overview

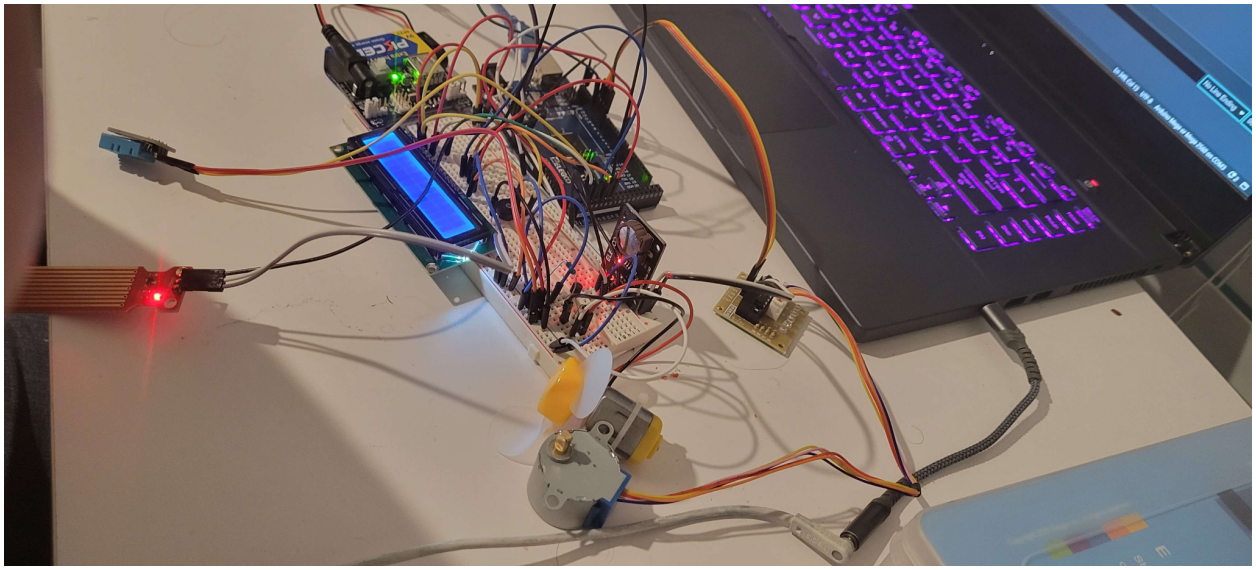
The circuit, when combined, allows the user to simulate a swamp cooler. In order to use the system, the Arduino must be connected to a computer/laptop/USB control source. The Arduino will send the client information regarding the system such as timekeeping, error messages, or other necessary information. In addition, the system can only operate in non-humid environments in order to preserve best use of the system. The temperature that the system works off of can be adjusted internally through the change of program constants such as temperature threshold values. However, it is advised not to use this system in extreme temperatures in the range of -40°C to 85°C. As these temperatures can damage the Arduino and its components in addition to impeding the functionality of the system.

The system itself is controlled by an external infrared remote controller designed to both start and stop the system, interrupting the system to change its states. This remote draws powers from the Arduino and will be disabled when power is cut from the Arduino. In addition, an external power source of 5V is necessary in order to power the stepper motor. This is to be connected with the Arduino in order to aid in functionality. The colored LEDs on the system have codes based on the system functionality. Yellow indicates that the system is disabled but still powered and awaiting for signal from the remote in order to proceed to other functionalities. Green indicates that the system is recording time, monitoring water levels, and waiting to activate the fan when the system detects environmental temperature threshold. Red indicates that the system has run into an error and will proceed to stop all system functionalities with motors and display any error messages onto the LCD display. Using the reset button on the remote should bring the system back to a green code if water level is normal. Finally, a blue indicates that the system is both running and the fan motor is running.

Final System Images



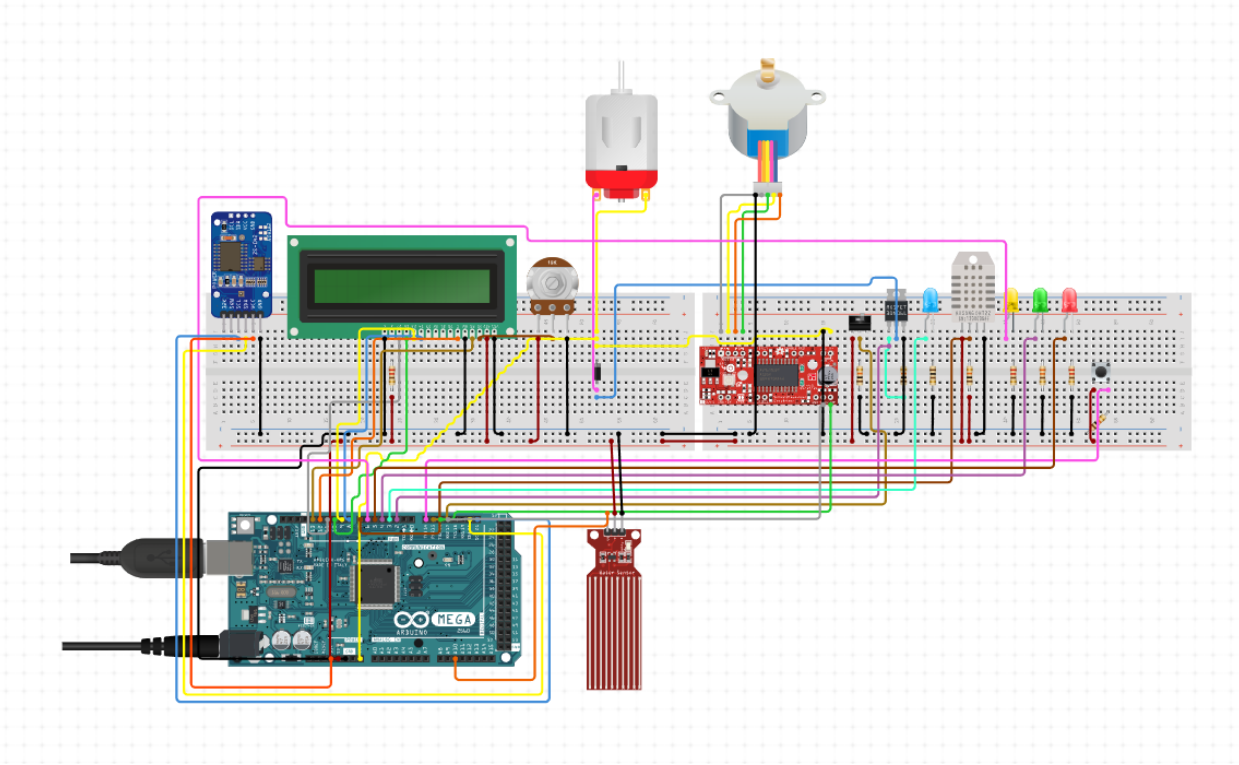




Video of Operation Link

https://youtu.be/SL8RDaoSajo

Schematic



Specification Sheets

MEGA 2560 Controller Board 1 PC	http://eprints.polsri.ac.id/4598/8/File%20VIII%20%28Lampiran%29.pdf
LCD1602 Module 1 PC	https://www.openhacks.com/uploadsproductos/eone-1602a1.pdf
Power Supply Module 1 PC	https://components101.com/modules/5v-mb102-breadboard-power-supply-module
Stepper Motor 1 PC	http://eeshop.unl.edu/pdf/Stepper+Driver.pdf
ULN2003 Stepper Motor Driver Module 1 PC	https://www.electronicoscaldas.com/datasheet/ULN2003A-PCB.pdf
Water Level Detection Sensor Module 1 PC	https://curtocircuito.com.br/datasheet/sensor/nivel_de_agua_analogico.pdf
DS1307 RTC Module 1 PC	https://www.analog.com/media/en/technical-documentation/data-sheets/ds1307.pdf
DHT11 Temperature and Humidity	https://www.mouser.com/datasheet/2/758/DH

Module 1 PC	T11-Technical-Data-Sheet-Translated-Version-1143054.pdf
IR Receiver Module 1 PC	https://www.epitran.it/ebayDrive/datasheet/45.pdf
Remote Control 1 PC	https://drive.google.com/file/d/1Bb2HeN1Q5kQtOWQeXjrpQvkYRQP3K7ts/view?usp=sharing
Potentiometer 10K 1 PC	https://drive.google.com/file/d/1MIeA_8eQh19gE2ISTeBFUkvwcbQFPCEt/view?usp=sharing
Fan Blade and 3-6V Motor 1 PC	https://drive.google.com/file/d/1SYFzeOzTR1CTXmtkGFpmen8e6IW5VMVk/view?usp=sharing
830 Tie-Points Breadboard 1 PC	https://drive.google.com/file/d/1wuxNvisjWl_tCd5R9foecoEm4tR4YVkF/view?usp=sharing
9V Battery with Snap-on Connector Clip 1 PC	https://drive.google.com/file/d/1o7iy8KCI-r6_TGkF5f3x1Ow9ORxaZDeQ/view?usp=sharing
Breadboard Jumper Wires 65 PCs	https://drive.google.com/file/d/1ZzzVp6JeGzDPh1YnBoiFFOgF0rjolIep/view?usp=sharing
Female-to-Male Dupont Wires 20 PCs	https://drive.google.com/file/d/1ZzzVp6JeGzDPh1YnBoiFFOgF0rjolIep/view?usp=sharing
USB Cable 1 PC	https://www.farnell.com/datasheets/810077.pdf
Resistor 120 PCs	https://drive.google.com/file/d/1ttotj-dO9qqWNcM4UznM68CCpBvK9A1L/view?usp=sharing
Diode Rectifier 1 PC	https://drive.google.com/file/d/1tM6lrgO9hsJLv_AhA52PlQeiRt905ggL/view?usp=sharing
Red LED 1 PC	https://drive.google.com/file/d/1a-3qAkRzHCQF7WsCQfR9csVRPzIuvbwT/view?usp=sharing
Blue LED 1 PC	https://drive.google.com/file/d/1CGneZK3LAGx_T1XQIvyGvvlgD8F-uRb-/view?usp=shar

	ing
Green LED 1 PC	https://drive.google.com/file/d/1z0czLSO_dxRcge0yN1DyjjFrjYk_14Nz/view?usp=sharing
Yellow LED 1 PC	https://www.farnell.com/datasheets/67136.pdf

Github Repository

https://github.com/Leung-Alvin/CPE-301-Final-Project.git