

CSC4640 Microcontroller Programming
Project Report
MocSense Advanced Environmental Sensor
Jake Roman, Tedros

1. Project Description

We are building the all in one solution to personal environmental management, a device which measures both temperature and humidity and shows it on an inbuilt OLED display.

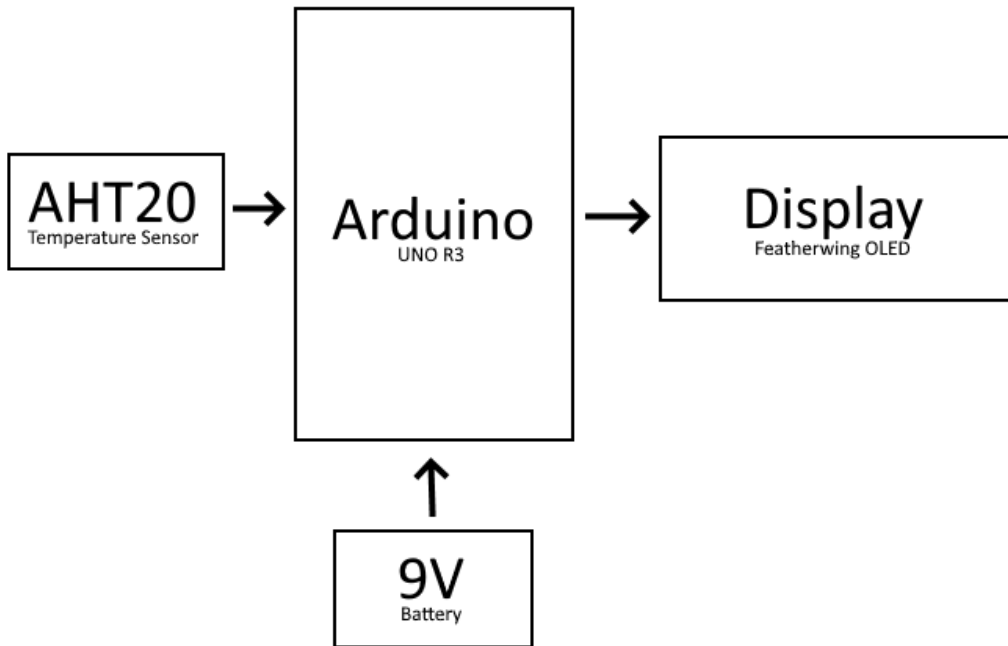
2. Specifications

The range of temperature that we aim for is simply anything that can't freeze and/or melt the project itself. As long as the temperature/humidity does not reach extreme levels, the product should work just fine. Our accuracy is very good, one should expect a 2-3 degrees (F) margin of error on temperature and a ± 2 percent margin of error on the humidity.

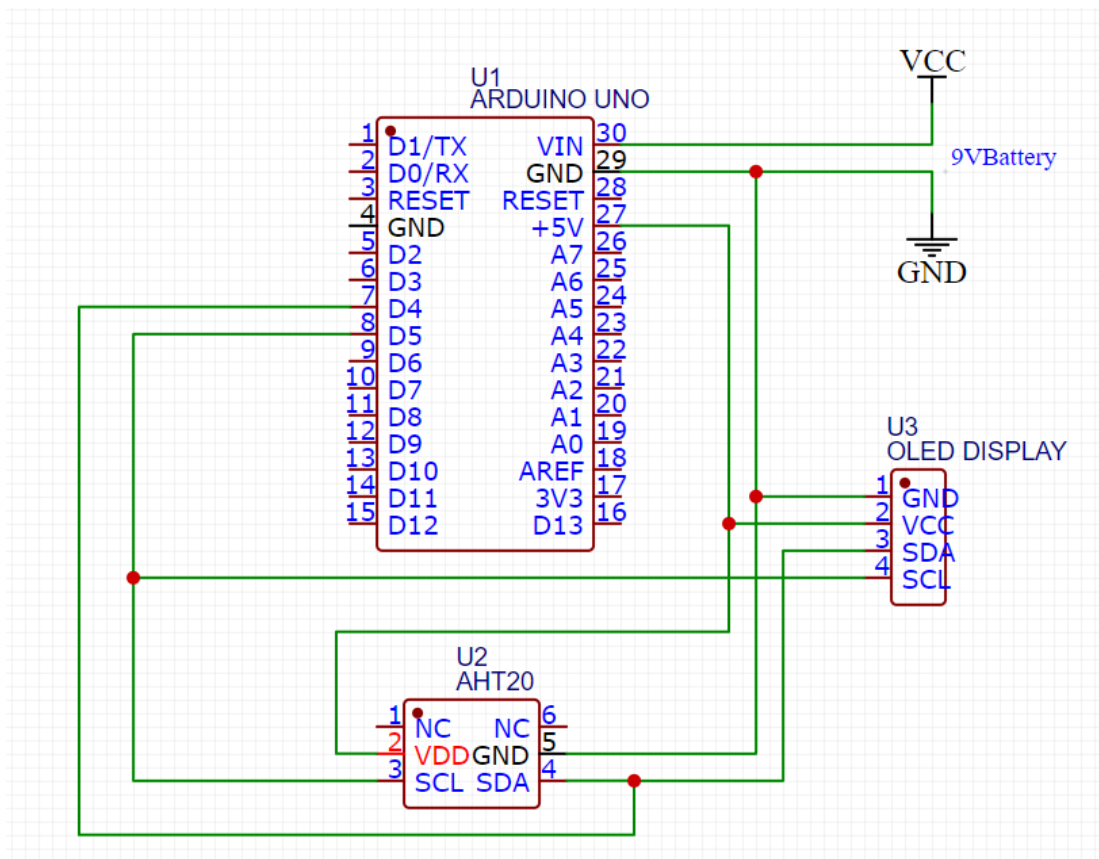
3. Bill of Materials

Component	Price	Purchase Link
Arduino Uno R3	~\$28	Amazon
AHT20 Temperature Sensor	~\$5	Adafruit
Featherwing OLED Display	~\$25	Adafruit
Battery Cable	~\$2/ea	Amazon
9 Volt Battery	~\$2/ea	Amazon
Miscellaneous Wires	~\$1	-
3D Printed Housing	~\$1-\$6	-
Total Project Cost	~\$64-\$69	

4. Block Diagram



5. Circuit Schematic (EasyEDA)



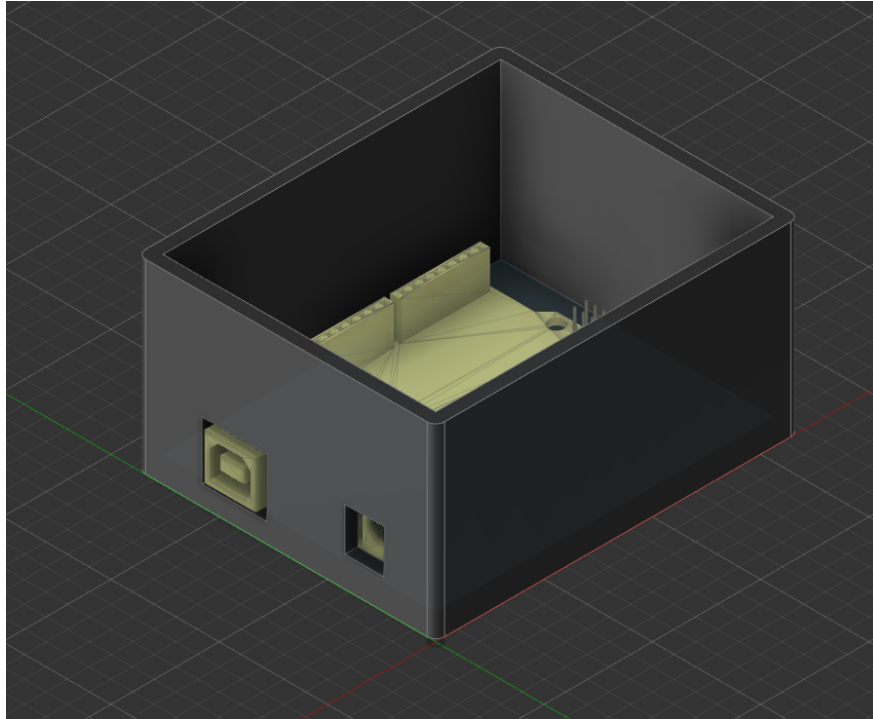
6. Source code of your program

Here you can find the Arduino project files we created for this product.

<https://github.com/tedros99/MocSense>

7. Any 3D model you created in Fusion 360

Here's a picture from Fusion 360, and the STL files are in the GitHub linked above.



8. Pictures and Youtube video of your device in action

Video of our product: <https://youtu.be/Xn0jcsYdXIY>



9. Testing of your device: actual dimension and weight of your device.

Dimensions: 84mm x 46mm x 69mm

Weight: Approx 260 grams

Tested Battery Life: 48 hours



10. Conclusions:

Jake: I feel that this was a great project incorporating 3D modeling, programming, soldering, and wiring into one relatively simple unit. The resulting prototype is functional and useful for measuring temperature and humidity. We also learned a lot about problem solving, and decision making in product design when trying to decide between the Arduino UNO and Arduino Nano, ultimately deciding on the UNO for its ability to regulate 9V input down to 5V.

Tedros: After completing this project, I feel very accomplished. Overall, I found it fun to work on an application of microcontrollers. Additionally, I am glad we were able to complete in a straightforward manner. We aimed to be as efficient as possible and it worked out swimmingly. This also applies to our overall composition. If someone wanted to recreate the temperature sensor, they would be able to do it relatively cheaply, maybe even cheaper than just going out and buying a professional one. I feel like this project was a success with minimal issues.