Executive Summary

ECE 342 (Junior Design 2) Team 5
Contactless Temperature Scanner
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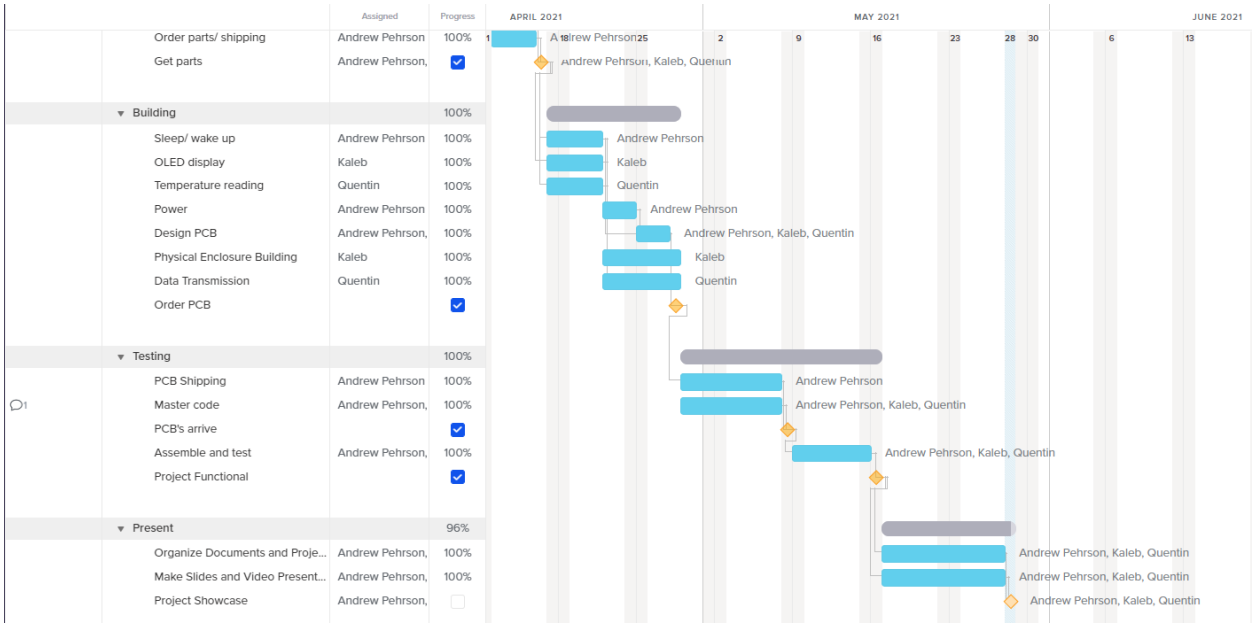
Oregon State
University

The objective given to team 5 for this project was to design and implement a system that is capable of checking and reporting the temperature of a human body without making direct contact. The major themes that this project focuses on are embedded design and interface design. In real life this system is quite a practical application especially due to the climate that has shifted as a result of the Covid-19 pandemic. Intuitive contactless temperature sensors allow for the need of individuals to physically take temperatures to be bypassed. The feature that reports when a temperature qualifies for a fever can prevent individuals who have high temperatures and may be sick from coming into contact with individuals with normal temperatures. In our implementation we approached this project with the mentality to create a system that was both versatile and efficient.

In order to meet this goal of efficiency and versatility we designed a system incorporating 2 sensors, an OLED and an ESP8266 Microcontroller. The sensors included a PIR sensor for motion detection and an IR Temp sensor to read temperature values. The project was designed in a modular fashion to allow each member of the group to implement at least 2 blocks of the project. The design took into consideration how smoothly the various components could be integrated together in the system verification phase. The first 3 blocks that the group worked on included the data analysis, power/wake up circuit and visual display. Once these blocks were completed motion detection, enclosure design and data transmission followed. At this stage the team ran into a few problems. First the wake-up circuit and OLED visuals both required access to a reset button that was being used on the microcontroller. To work around this problem we developed a circuit leading to another button for the wakeup circuit . Second the data transmission was being blocked by security policies and prevented data from going into google sheets. To work around this we sent the data to thingspeak, which is a web server designed to communicate with microcontrollers and allows data to be exported into .csv files. At this stage the project timeline transitioned from the testing phase to system verification and the PCB was designed since all of the connections were known. At this stage the group worked to integrate each block together and developed a library to use for the final code. The process of creating the library was difficult and time consuming but it created a much better finished product that is clean and organized. Once the PCBs came in the components were soldered on and the 3D model was printed.. At this stage the final touches of the code were the last step. Once the code was done it was flashed on the board and its functionality was verified.

In all our team learned so many things throughout the course of this project. We learned the significance of planning before jumping into implementation. Very closely related to the old saying “measure twice and cut once”. Especially during this time of remote learning it is important to be as accurate as possible because wasting time and resources is significantly more damaging. We also learned about I2C protocol as 3 of the components followed this protocol and gave exposure to how many sensors transmit data. Lastly we learned how to independently work on sections of an engineering project that will connect with other components to create a complex system from a basic one.


Assigned
Progress
APRIL 2021
MAY 2021
JUNE 2021
1
18
25
2
9
16
23
28
30
6
13
Order parts/ shipping
Andrew Pehrson
100%
Andrew Pehrson
Get parts
Andrew Pehrson,
Andrew Pehrson, Kaleb, Quentin
Building
100%
Sleep/ wake up
Andrew Pehrson
100%
Andrew Pehrson
OLED display
Kaleb
100%
Kaleb
Temperature reading
Quentin
100%
Quentin
Power
Andrew Pehrson
100%
Andrew Pehrson
Design PCB
Andrew Pehrson,
100%
Andrew Pehrson, Kaleb, Quentin
Physical Enclosure Building
Kaleb
100%
Kaleb
Data Transmission
Quentin
100%
Quentin
Order PCB
Testing
100%
PCB Shipping
Andrew Pehrson
100%
Andrew Pehrson
Master code
Andrew Pehrson,
100%
Andrew Pehrson, Kaleb, Quentin
1
PCB's arrive
Assemble and test
Andrew Pehrson,
100%
Andrew Pehrson, Kaleb, Quentin
Project Functional
Present
96%
Organize Documents and Proje...
Andrew Pehrson,
100%
Andrew Pehrson, Kaleb, Quentin
Make Slides and Video Present...
Andrew Pehrson,
100%
Andrew Pehrson, Kaleb, Quentin
Project Showcase
Andrew Pehrson,
Andrew Pehrson, Kaleb, Quentin