GNG 1103 – Engineering Design

Project Deliverable G: Prototype II and Customer Feedback

Section B01

Team 5

Team Members:

1) Uzochukwu Ekenedilichukwu Ebenebe

2) Nalida Awog-Badek

3) Nicole Meouch

4) Owen Haralovich

5) Kayden Wang

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Introduction

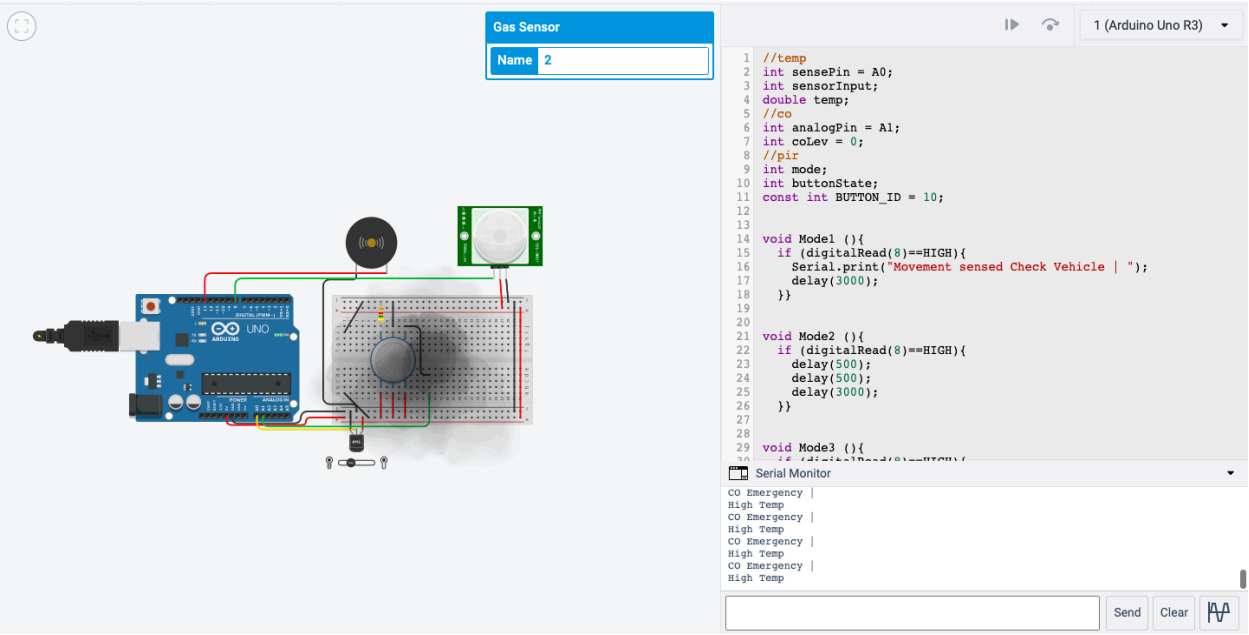
In the previous deliverable, we presented the first prototype to the client. This document highlights the team's approach to the implementation of feedback from the presentation of our first design prototype to the client. The first prototype was a basic proof of concept, which was tested, analyzed, and optimized towards getting the best design fit to solve our client’s problem. This second prototype upon completion will be presented to our client for feedback. The second prototype is a physical model of the Tinker cad model we already made.

Client feedback from Prototype 1

- Try and be more specific with the source of power
- Make it more user-friendly UI
- Inform the user immediately as soon as they leave the car
- Attempt to save power but not having it run constantly and activate the devicce once the user has left the vehicle

Prototype 2

In this updated prototype none of the physical components have changed nor the required parts, there have only been some changes to the code. These changes include some changes to shorten the code, making the outputs/ warning easier to understand (from numerical outputs to text outputs), furthermore the components can now work in unison rather than only independently.



In this prototype you can see the new text outputs and how they can be displayed at the same time, to add the code is a lot cleaner which helps in efficiency as well as overall team comprehension behind the logic of the code. Lastly, we plan on using an Arduino nano in our next prototype to reduce cost and overall size of the product, size does not trump function though.

Logic/ Functionality

The functionality of the prototype was not altered at all, as stated before only the code has changed. To elaborate on this, previously the PIR acted as just a failsafe in case the temp nor CO sensor functioned properly, but now it can function freely and detect if there is a child before anything bad happens, now it works as a precaution and a fail-safe giving it more purpose. Of course, the range does not encompass the entirety of the vehicle but the PIR is required only in the back seat or where ever the user would like to place the product to look for their child

Next plans

For the next prototype we plan on possibly incorporating some type of Bluetooth receptor to be able to transfer the data to a cellular device. Furthermore, the next prototype will have a higher-powered speaker which we can test the validity of our solution in alerting the driver and passersby.

Prototype 3 Test Plan

Test#	Test Objective (why)	Description of prototype used and basic test method (what)	Description of expected results and how the results will be used (how)	Estimated test duration and planned start date (When)
1	Effectiveness of PIR sensor	This will be tested by connecting the PIR sensor to the Arduino kit and see the response from it when sit in the vehicle and get out of the vehicle	Sit at the child's seat in the vehicle, the person will be detected by the PIR sensor and there will be a warning. Leave the vehicle with nobody inside and there will be no reaction. (Since PIR sensor can detect heat energy from human body)	10 minutes. The test will start as soon as the object is received

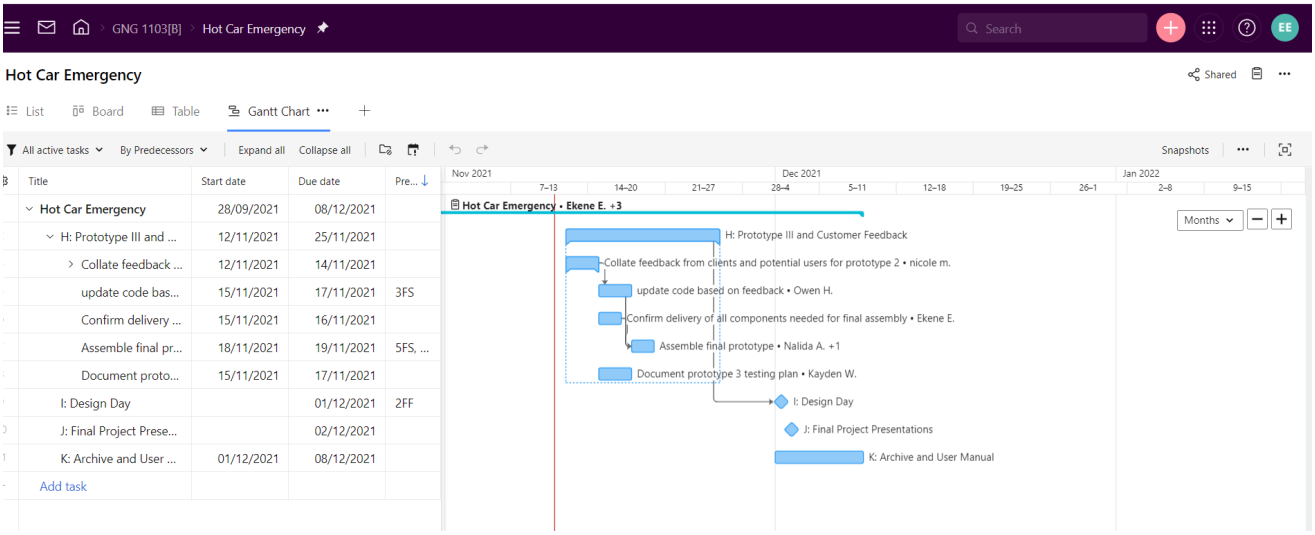
2	Accuracy of CO sensor	Determine the minimum and maximum amount of CO/Gas the sensor can detect. This will be tested by connecting the CO/Gas sensor to the Arduino kit and slowly releasing CO/Gas into the isolated vehicle	Testing the function of the CO/Gas sensor by slowly adding gases into the vehicle and see the results 20 - 2000 ppm	20 minutes. The test will start as soon as the object is received
3	Accuracy of Temperature sensor	Determine the lowest and the highest degrees of temperature the temperature sensor can measure. This will be tested by connecting the temperature sensor to the Arduino kit and slowly adjust the air condition of the vehicle	Testing the function of the temperature sensor while adjusting the air condition. Then take the results. 0-50 Celsius degrees	20 minutes. The test will start as soon as the object is received

4	Speaker	Make each of the sensors exceed the threshold one at a time. Test the speaker for proper operation	The speaker will remind driver by playing an audio	20 minutes. The test will start as soon as the object is received

Conclusion

We have implemented feedback received from the client into the code for our device. However, because we just had the meeting on the 10th of November, we could assemble a physical prototype just in time for this document. we have done a demonstration for potential customers around us and so far, we received good feedback with keen interest towards implementation of a physical product. We are also finalizing purchases for all components needed to rebuild our prototype to a physical model.

Appendix


GNG 1103[B]
Hot Car Emergency
Search
EE
Hot Car Emergency
Shared
List
Board
Table
Gantt Chart
All active tasks
By Predecessors
Expand all
Collapse all
Snapshots
Title
Start date
Due date
Pre...
Hot Car Emergency 28/09/2021 08/12/2021
H: Prototype III and ... 12/11/2021 25/11/2021
Collate feedback ... 12/11/2021 14/11/2021
update code bas... 15/11/2021 17/11/2021 3FS
Confirm delivery ... 15/11/2021 16/11/2021
Assemble final pr... 18/11/2021 19/11/2021 5FS, ...
Document proto... 15/11/2021 17/11/2021
I: Design Day 01/12/2021 2FF
J: Final Project Prese... 02/12/2021
K: Archive and User ... 01/12/2021 08/12/2021
Add task
Nov 2021
Dec 2021
Jan 2022
7–13
14–20
21–27
28–4
5–11
12–18
19–25
26–1
2–8
9–15
Hot Car Emergency • Ekene E. +3
Months
H: Prototype III and Customer Feedback
Collate feedback from clients and potential users for prototype 2 • nicole m.
update code based on feedback • Owen H.
Confirm delivery of all components needed for final assembly • Ekene E.
Assemble final prototype • Nalida A. +1
Document prototype 3 testing plan • Kayden W.
I: Design Day
J: Final Project Presentations
K: Archive and User Manual