

EE/CprE/SE 492 BIWEEKLY REPORT 1 (8/30/2019 – 9/13/2019)

Group Number & Project Title: (5) Road Safe Phone Case

Client: Christine Shea-Hunt

Advisor: Dr. Diane Rover

Team Members/Role: (Software) Zixiao Lu, Yifei Wang

(Hardware) Kedan Xin, Yue Chen, Sarah Baratta

Weekly Summary

Since the start of the fall semester, the team has met several times to begin working on our Road Safe Phone Case project once more. After a comparison of schedules, we have set up times to meet with one another to work and to also meet with our advisor, Dr. Rover. She has been out of town so the plan is to meet with her next week when she returns.

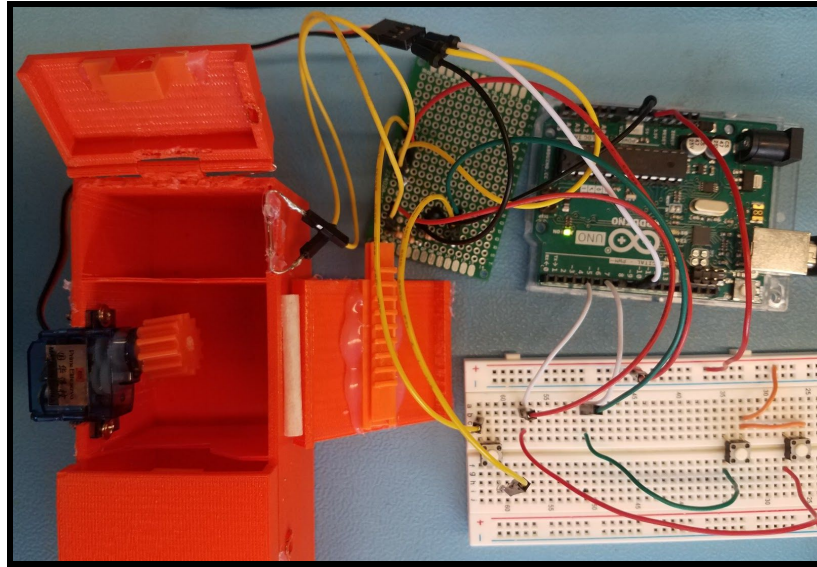
The team has reviewed the progress made last semester with the small 3D prototype, and has taken note of all remaining components to build a fully functional case. Approximately two-thirds of the components have been successfully tested, so parts have been purchased and plans have been made to tackle the remaining tasks this semester. Already, testing has begun on vital circuitry such as emergency access and the RFID phone and key detection. Also, the team started to make a plan for building the actual size phone case after testing. At this point, the team found that the 3-D printing for the actual size is quite expensive. The team plans to continue to research an alternative way to build the case.

Past week accomplishments

For this past week, the team tackled some of the more achievable tasks to get momentum going. Testing last semester ended with checking if the RFID sticker attached to the phone/key could be read. From previous experiments, the team learned that the phone material is not compatible with conventional RFID stickers. Thus, other versions of RFID stickers were researched, specifically anti-metal. Kedan came across a one-time-use sticker that would work well with the case functionally because it would discourage drivers from trying to trick the case by removing the sticker. However, this type of sticker could not be found in combination with the anti-metal property. Instead, the more important of the two types were bought which was the anti-metal sticker along with a small Arduino nano which is to be used in the final product.

Another portion of the circuit that was worked upon was the emergency button. This had to function with the existing locking motor. Thus, the prototype was powered up and the team refreshed themselves on the functionality before attempting to add the emergency push button. In order to do this, the two major sensors - phone and key detection - were jumpered

around with a push button. Thus, when the button is pressed, the current will bypass the sensors and communicate with the microcontroller to flip sides. The only issue is that one push button was not sufficient to act as a two way jumper, thus two separate buttons had to be used even though they represent one emergency button. Shown in the image below is the emergency button testing.



Described below is what each individual team members worked on:

Zixiao Lu: Attended group meeting, researching and working on the addition of the RFID Unit Code

Yifei Wang: Attended group meeting. Discussed with teammates on how to solve arduino problem.

Kedan Xin: Redrew and reconnected main circuitry and worked on emergency circuit. Revised 3D model of the case. Searched 3D printing service online. Bought anti-metal RFID tag and new smaller microcontroller.

Yue Chen: Worked on the emergency circuit with team. Searched the price for 3-D printing actual phone case. Made a plan for assembling parts.

Sarah Baratta: Searched for smaller microcontrollers and RFID stickers. Helped test emergency circuit. Began to draw a more detailed footprint of the life-sized case and how the circuits will be enclosed inside it.

Individual Contributions Table:

Name	Individual Contributions	Hours This Week	Hours Cumulative
Zixiao Lu	Attended group meeting, researching and working on the addition of the RFID Unit Code	6	50
Yifei Wang	Attended group meeting. Discussed with teammates on how to solve arduino problem.	6	56
Kedan Xin	Redrew and reconnected main circuitry and worked on emergency circuit. Revised 3D model of the case. Searched 3D printing service online. Bought anti-metal RFID tag and new smaller microcontroller.	6	63
Yue Chen	Designed and tested the emergency circuit. Searched the price for 3-D printing.	6	60
Sarah Baratta	Researched alternative parts, tested emergency button, contacted client, set up meeting time with advisor	6	60

Plans for the Upcoming Week

The team plans to meet with our advisor in the beginning of next week. During this meeting, major obstacles that the team has yet to overcome (primarily the emergency notification to parents functionality) will be discussed in hopes of finding a better alternative to past approaches that the team has deemed insufficient for the end product.

It was also discovered after researching places to 3D print bigger objects that for the real-life case size, it would cost approximately \$100 for the entire case as it currently designed, which is subject to change. Thus, we will research if there are cheaper yet still reliable materials to build the end product. If it happens that none is found, then the model that is sent to be 3D printed at the end of the semester must be perfect. To anticipate how the final case will look, another

prototype will be made using craft products that will be bought. This prototype will be life-size and measured to fit all the components that we are using.

Described below is what each individual team members plans to work on:

Zixiao Lu: will work on adding the RFID System into the overall circuit

Yifei Wang: Will work on code of the project(add RFID system into the overall circuit)

Kedan Xin: Trying to find somewhere to print the life-sized case. Add RFID reader and stickers into the overall circuit system.

Yue Chen: Keep researching an alternative way to make the case and the material to block the signal.

Sarah Baratta: Take a trip to Hobby Lobby to build a life-size prototype using cheaper materials and begin to build the final model with existing circuitry.