EE/CprE/SE 492 BIWEEKLY REPORT 2 (9/28/2019 – 10/11/2019)

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

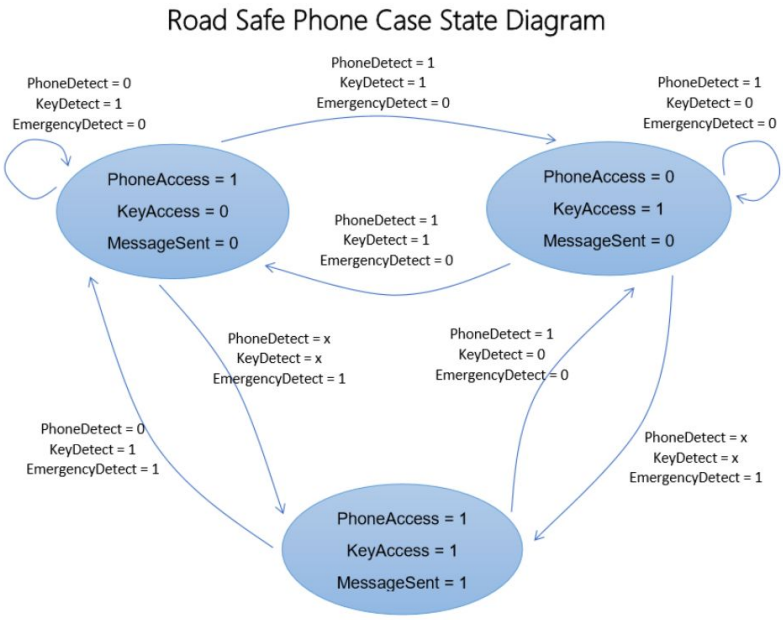
(Hardware) Kedan Xin, Yue Chen, Sarah Baratta

Weekly Summary

For the past two weeks, the team has focused on the first senior design presentation, organizing the project, and evaluating feedback from other senior design groups. After the last meeting with the advisor, Dr. Rover suggested making a state machine to make it easier to observe the project's activity. The team has made two state machine diagrams and will discuss and compare them at the next team meeting. At this point, the team struggles to achieve the texting function without financial involvement but has decided to move forward with a script, which may prove to be free at the cost of more functionalities such as storing user information. Also, the team is striving to optimize the coding of the microcontroller in order to minimize the hardware cost. The team has successfully completed the emergency bypass function through coding and has reduced the physical size of the hardware.

Past week accomplishments

The team created a state diagram, as shown on the right, to help make the Road Safe Phone Case functionality easier for people outside of the team to understand. This image will be added to the website's project description after comparing this version with other teammate's versions to determine which one is the most helpful.



Another item the team worked on was creating the bill of materials, which is shown on the following page, to identify which parts were being used in the circuit, where they

had been purchased from, and at what price. Then with this information, cheaper alternatives were researched to determine what the cheapest price the case could be sold for to achieve a reasonable profit when the product is eventually marketed. The team estimated the current cost (excluding shipping and extra parts (packs of 20, etc.)) to be equal to $37. The cheapest cost (considering only 3D printing material cost) was estimated to be somewhere between $10 - $15.

Bill of Materials:

Name	Description	Quantity	Cost per Each	Cheapest
Arduino Nano	LAFVIN Nano V3.0, Nano Board ATmega328P (Amazon)	1	4.66	2.00
RFID reader	RC522 RFID RF IC Card Sensor Module (eBay)	2	1.46	1.00
RFID anti-metal sticker	YARONGTECH 8 x NFC sticker RFID anti-metal (Amazon)	2	0.87	0.75
3D Printed case	Lids, compartments, locking mechanism. Case weight = 300g of material = $6 Charge for using campus printer = $remainder	1	25.00+	$6-10
Circuit components	2 resistors, many wires, emergency push button (free from ETG)	1	0.00	0.25
Servo Motor	Organizer 5 Pcs SG90 9G Micro Servo Motor Kit (Amazon)	1	1.80	1.70
Reed sensor	Reed sensor pack of 20 (Amazon)	2	0.45	0.28
Magnet	To activate reed sensor (Amazon)	2	0.05	0.05
Battery	Non-rechargeable 9V Alkaline battery	1	0.66	0.60

The team also presented to other senior design groups about the project and the technical difficulties that the team is currently facing. The main difficulty is the messaging function. However, instead of providing feedback for this portion, most of the advice received was concerning battery life or possible alterations to the phone case such as making the lid clear so that the GPS map could still be viewed while driving or making a hole to insert a car charger cable through to the phone. The team also worked together to provide valuable feedback for other team's struggles.

Described below is what each individual team members worked on:

Zixiao Lu: Working on the SMS module and the scripts

Yifei Wang: Attend meeting to demo, present the recent work to other teams and worked on scripts with Lu.

Kedan Xin: Meet with advisor demo, working on the presentation, testing the emergency function, creating bill of materials with Sarah, modify the case

Yue Chen: Attended the meeting for the presentation. Attended presentation. Helped coding for emergency bypass. Made a state diagram separate from Sarah's version.

Sarah Baratta: Helped re-integrate the emergency button into existing code. Practiced presentation with the team. Created one version of state diagram to make the project functionality more understandable. Worked on bill of materials with Kedan.

Individual Contributions Table:

Name	Individual Contributions	Hours This Week	Hours Cumulative
Zixiao Lu	Working on the SMS module and the scripts	6	62
Yifei Wang	Attend meeting to demo, present the recent work to other teams and worked on scripts with Lu.	5	67
Kedan Xin	Meet with advisor demo, working on the presentation, testing the emergency function, creating bill of materials with Sarah, modify the case	6	78
Yue Chen	Attended the meeting for the presentation. Attended presentation. Helped coding for emergency bypass. Made a state diagram.	6	72

Sarah Baratta	Meet with advisor demo, working on the presentation, evaluating feedback, creating the state diagram, creating bill of materials with Kedan.	7	75

Plans for the Upcoming Week

For the upcoming week, the team will continue work on the texting function of the project. At the same time, different ways to achieve the emergency texting function will continue to be researched as this has proved to be the main technical difficulty for the group to overcome.

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

Zixiao Lu: Finishing up the SMS module, testing it on actual device.

Yifei Wang: work with Lu and test script on virtual machine.

Kedan Xin:modify the case. Will test the whole system if the communication part is done.

Yue Chen: Research different ways to achieve the texting function. Help Kedan to modify the case.

Sarah Baratta: Revisit our 3D model for the phone case and to see if the adding holes for sound or charging the phone will look presentable and be better for the design. Help test communication module.