sdmay19-16: Smartphone App to Detect TwD (Texting while Driving)
Week 4 Report
September 30 - October 6

Team Members
Kristina Robinson - *Project Lead*
Lucas Golinghorst - *Test Engineer*
Sara Mace - *Meeting Scribe*
Derek Clayton - *Report Manager*
Andrew Knaack - *Lead Designer*

Summary of Progress this Report
The focus of this week was to develop several solutions to present to our client, along with our feasibility reports. Each member thoroughly investigated a possible solution and reported on how feasible they thought it was. After meeting with the client, was determined that the solutions we will be pursuing are: texting speed monitoring, real-time spell checking, speedometer tests, and GPS-powered centripetal acceleration tests. Solutions eliminated included: NFC/RFID tags, external cameras, monitoring leg lift, bluetooth hardware, and phone camera tests. A new solution of examining phone handling came up in the client meeting and will require further study.

Pending Issues
- More research must be conducted on the phone handling solution.
- The application and phones must be upgraded from Android 4.0 to 6.0.
- The proper equipment for charging the phones must be obtained.
- The design document must be completed.

Plans for Upcoming Reporting Period
- Each member will complete a portion of the design document.
- Formulate plans for data collection.
- Members with cars should take pictures of their car's roof from the driver's seat to collection feature points for the camera test.
- Formulate strategy for collecting data on speedometer test, camera test, and texting speed test.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Kristina Robinson	Did more research about how the University of Waterloo used a camera to determine if a driver is distracted. We were looking into using this as a possible component to our solution but since we are not using external hardware, this will not be included in our solution. Added the camera solution listed about and using the speed to determine if someone is driving to slides for our client with	6	25.5

	all of our possible solutions. Worked with team to determine which of the 12 possible solutions would be feasible for our project so we could work with the client to start collecting data to narrow our solution down more.		
Lucas Golinghorst	Researched camera seat belt detection and leg lift monitoring as possible solutions. Created slides from the information to present to client with the focus being on the feasibility of these solutions. Worked with the team to narrow down our list of options.	6	26
Sara Mace	Researched how to detect location of the phone in the car using RFID/NFC tags. From the information I discovered I worked on preparing slides to be presented to the client. I also helped decide on the feasibility of this proposed solution. Then worked with the team to help narrow down the list of possible solutions	6	25.5
Derek Clayton	Created presentations on possible solutions and determined their feasibility with team. Researched the use of centripetal acceleration and angular speed to detect the position of user in vehicle. Examined the detection algorithm and investigated the 3 methods of detecting: Cigarette lighter accelerometer, OBD-II angular speed sensor, and GPS velocities. Determined that the non-external hardware GPS velocity approach would be our method for testing acceleration.	6	24
Andrew Knaack	Researched and found useful Android interfaces for tracking texting speed and spelling errors as machine learning and TwD detection solutions. Created the basic frame of the project in Android Studio and uploaded it to Gitlab so any team member could access it. Contributed to Design Document, primarily by extensively fixing the formatting and writing in parts that were similar to the Project Plan	7	25
Ryan Baker	Created presentations on options for solutions and determined feasibility for those solutions. Researched the use of the front/back camera. There was no papers that	6	25

	I could find that used this. I used Google Scholar, IEEE and other sources as well as a librarian and nothing came up. Also briefly looked into the possibility of using Bluetooth, but quickly rule that out due to lack of hardware		
		Total Group Hours:	151

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Gitlab Activity Summary

- 10/1/18: Andrew Knack initial commit, created skeleton android application on repository (31 changed files, 604 additions).
- 10/2/18: Sara Mace updated the project's gradle file (8 changed files, 47 additions, 53 deletions).
- 10/3/18: Kristina Robinson updated android studio module files and gradle build (2 changed files, 4 additions, 1 deletion).