University of Regina

CS 455 – Mobile Computing
Project Proposal

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Team Members

- Michael Dickenson
    - Sensor suite
    - GPS
    - User Interface
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    - Sensors
    - GPS
    - Data storage/processing/manipulation
- Santiago Félix Cárdenas
    - Data processing/visualization
    - User Interface

ON the Road

The amount of mobile devices in the world is constantly increasing, and new devices are being designed, making them smaller, more powerful, adding newer and better features, etc. Similarly, the amount of information that modern computers can collet and process is increasing at and incredible rate, and as a result, the opportunities for innovation, research and development are endless. Consequently, the amount of mobile devices has significantly impacted the amount of data created everyday. Due to the fact that modern devices have numerous sensors and features that allow developers and companies to collect different kind of data. However, we as computer scientists, must know how to gather that information, process it, interpret it and obtain knowledge from it, otherwise the information is useless.

As we try to learn to develop for iOS devices, we want to take advantage of all the tools that mobile devices provide us, in order to create useful and meaningful applications that will hopefully impact the user in a positive way.

As modern vehicles have different types of diagnosis and analytics already built in, older cars do not share the same luxury. However, an app like ON the Road would allow any person with a mobile device (iOS) to keep track of their every day driving and provide them with different kinds of analytics, which could be important and helpful for them. Most modern vehicles provide us with some fuel efficiency information or distance traveled in a trip (or overall lifetime of the vehicle), yet the information is only available in the vehicles dashboard and it is overwritten as soon as we start a new trip, therefore, if we wanted to keep track of daily distance, daily fuel consumption and time spent driving, we would have to do it manually. We want to create a friendly application where the user can feel comfortable navigating, a powerful application that provides useful and meaningful information that the user can interpret and understand, and we want to create a universal application that can be practical to any user with an iOS device.

The purpose of ON the Road is to provide the user with clear and simple analytics that can help improve the driving experience of the user. Additionally, we want to develop something innovative and different from the countless applications that already exist. After looking in the AppStore for similar applications, we were not able to find an application that could compare to our idea, therefore, we hope to bring something new for users interested in that area.

As soon as the user opens the application for the first time, he/she will be prompted to create a profile for their vehicle, enter some basic information about the vehicle and finally select whether the vehicle is for personal or work use. In case the vehicle is used for both purposes, the user will have the option to switch between work and personal and save different driving logs. After one or several vehicle profiles are created, the user will be directed to the app's home screen. Here users will be able to select different options from both, the home screen menu, and the navigation menu that will always be displayed at the bottom of every screen of the app. From the home screen, a user can start recording a trip,

which will record the route the user is taking to reach a destination (Maps), record the different velocities at which the vehicle is moving and significant acceleration and deceleration changes. When the user reaches the desired destination they can stop the recording and the information will be stored on the device and used in the construction of the other features of the application.
Once the information is saved, a log will be created and each trip will have a name that the user will determine. The log screen can be accessed through the navigation menu at the bottom of the screen. The log screen will have a list of different trips that the user has saved and each one of them will show basic but important information about each trip. In this screen is where the 3D touch comes into play, enabling the peek and pop feature. By selecting a specific trip with a hard press, a preview of the trip's route will be displayed. Adding on, by only doing a normal select touch the user will be able to access to more detailed information about that trip, such as a color coded and detailed map of the route showing the efficiency of the drive at different times, total trip time, overall efficiency and the date of the trip. As a handy feature, there will be an option in the navigation menu to access the map of the most recent trip completed, that way the users do not have to access the trips log and select the last trip.
The analytics window will consist of multiple friendly charts or graphs. They will display the total time of a trip as well as how much time the user spent in each different efficiency zone. It will also be able to compare efficiency between trips, and it will be able to display analytics for distance traveled during trips.

Features and functionality

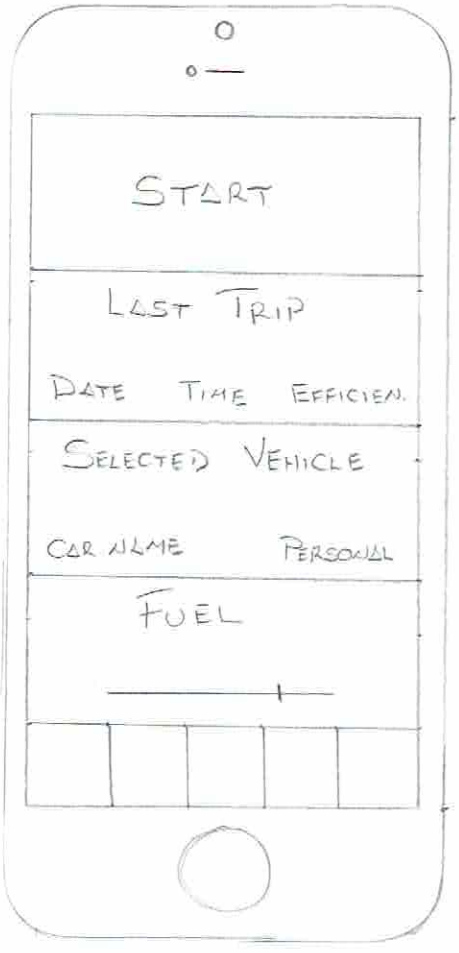
- Driving analytics
    - Driving time
        - Total driving time
        - Time spent driving at different speeds
    - Driving efficiency
    - Kilometers driven per trip
- 3D touch features

    - Enable 3D touch to access shortcuts from device home screen
    - Add peek and pop feature to preview a map of a logged trip
    - Enable 3D touch to display additional information in trip maps and analytics charts/graphs
- Allow users to create multiple vehicle profiles with the option of switching between a personal and a work vehicle
- Gas station proximity and prompting the user with fuel messages
- Prompt the user to stop recording trip based on device position
- Allow the user to discard trips and edit trip names

Extra features and functionality if time allows it

- Allow the app to run in the background at all times and automatically start recording when the vehicle reaches a certain speed
- Lock device while recording a trip
- Connect to the appropriate car information API to determine each vehicles fuel consumption and gas tank size and determine the unit system (km/l or mpg) based on the users current location

Home Screen



* Click START
  - ↳ Screen Transition / Animation To Bottom Screen

← Click
- ↳ Log of Trips

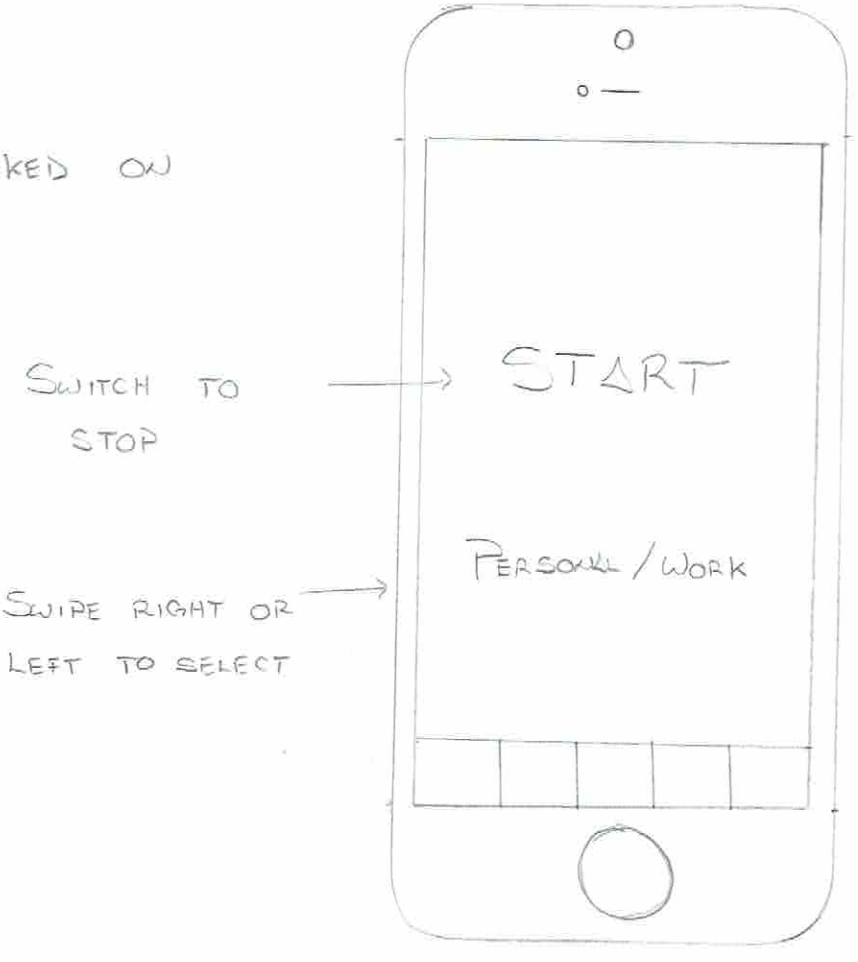
← Click
- ↳ Vehicle Profiles

← Last Time Fueled

← Home | Log | Analytics | Map ? | Vehicles

Trip Screen

* All screens always locked on Portrait mode



LOG SCREEN

* 3D TOUCH: PREVIEW OF TRIP MAP / ROUTE

* SELECT TRIP TO NAVIGATE TO BOTTOM SCREEN.

← SWIPE LEFT TO DELETE TRIP

NAME TRIPS TO IDENTIFY EASILY?

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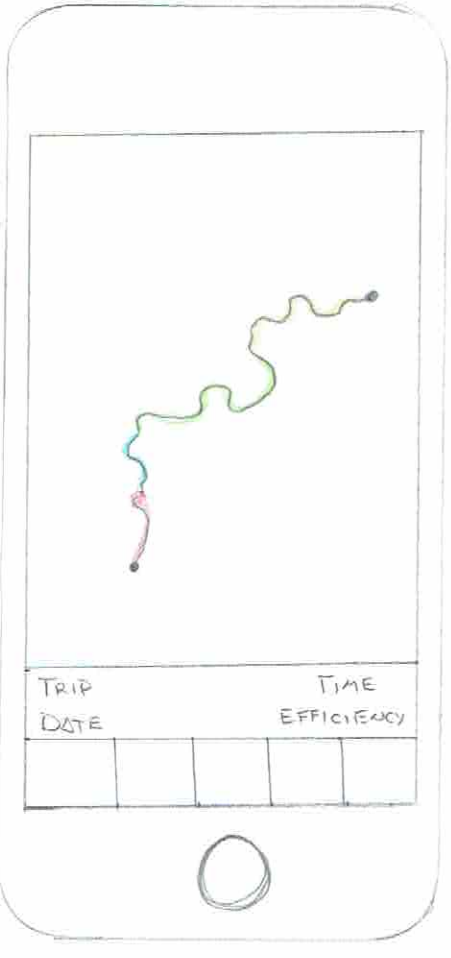
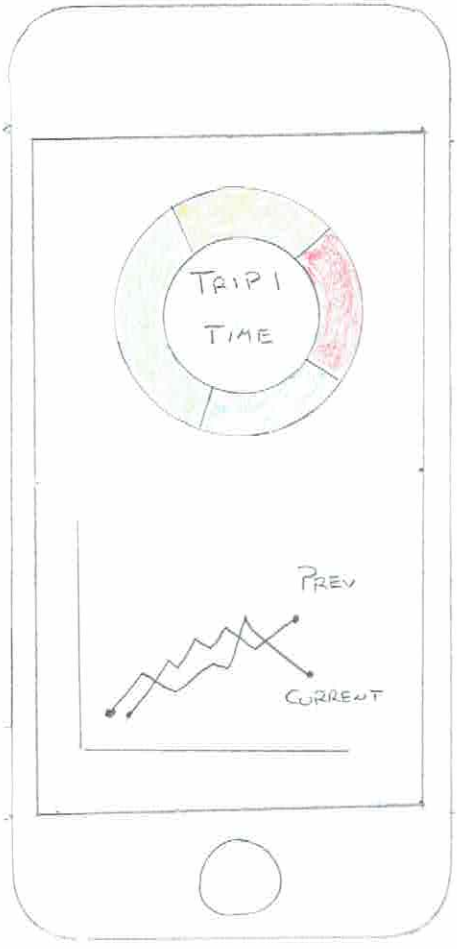
* DIFFERENT COLORS ON MAP SHOW EFFICIENCY.

* 3D TOUCH TO SHOW EXTRA INFORMATION
  - TIME SPENT ON EACH ZONE?

- NOT MOVING / 0 - 10 km/h ?
- GOOD
- AVERAGE
- BAD



Analytics Screen



← Display %

* Show more information?
  - ↳ Distance Traveled
  - Time
  - Efficiency
  - Date

← Compare to Previous Trip

* Overlaped line graph

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iPhone Home Screen

* 3D Touch for shortcut actions