Ubiquitous Computing Spring 2016

Driving Behavior Analysis

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Project Purpose

- This system will collect data from OBD reader, google map, phone sensors, to analyze if the driver drives the auto appropriately.
- Then the system will gives a report to user about their driving behaviors, and which part of driving behavior should be corrected.

OBD2

Web Server

Report

Apache
PHP
HTML
Google Map

Data

OBD2

- Speed
- RPM
- Driving Duration
- Lots of engine data

Phone

- GPS Location
- Time
- Google map Information
- accelerometer

Analysis

Example of Analysis:

- Driving Speed is greater than limit speed information from google map

  → Speed too high
- Engine start and stop time

  → Long time driving reminder
- Speed increase or decrease change too fast in short time (4 secs)

  → Rush acceleration and hard break
- Speed to high(30 miles) if bearing data greater than 75 degrees

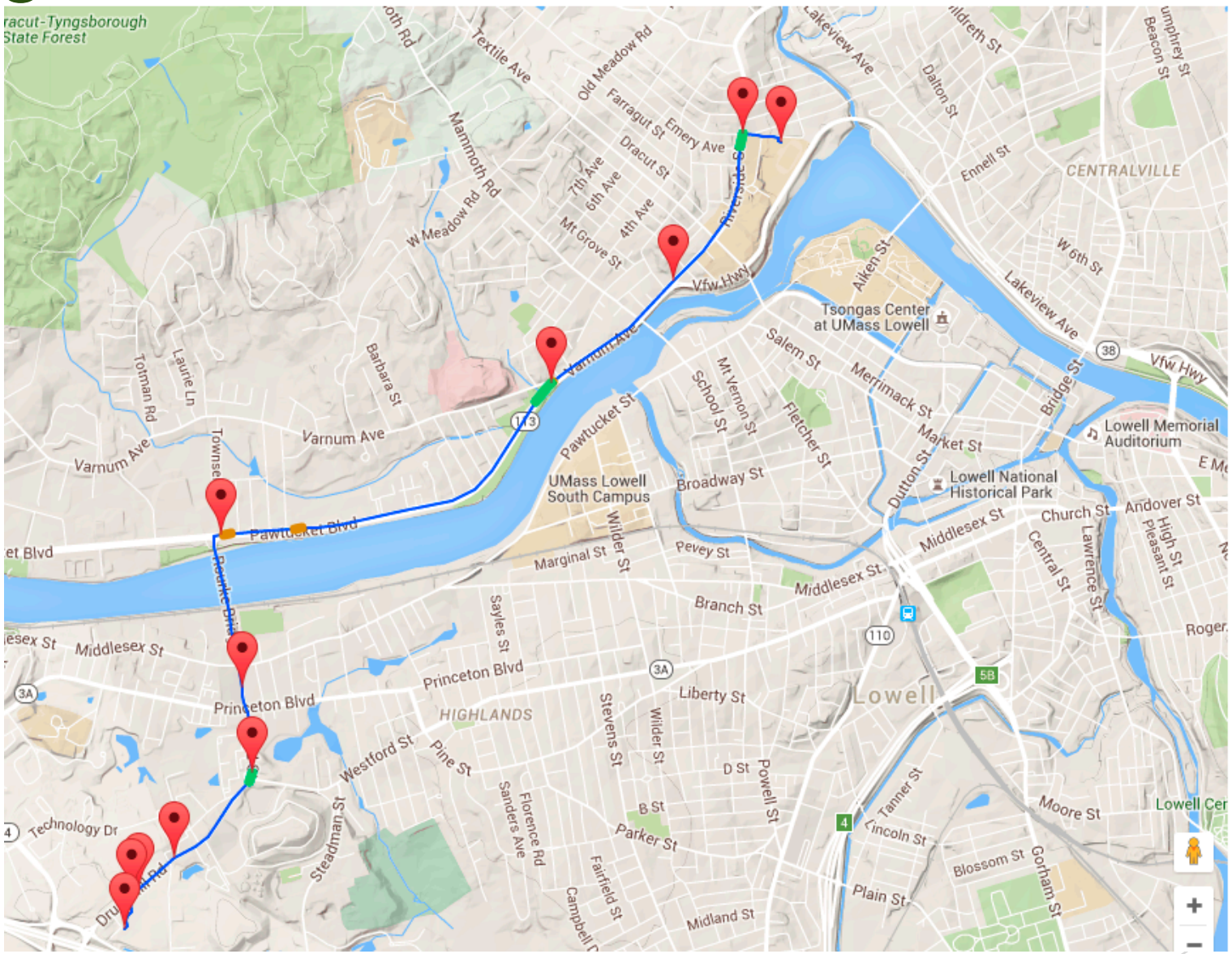
  → Turning speed too fast

Report

- Driving duration
- Driving route showing in google map
- Max speed, Avg speed
- Full stop count
- Hard break count
- Over acceleration count
- Driving suggestion(TBD)
- Over speed limit count (TBD)
- Remind if gas station or restaurant closed by car (TBD)

Demo

Driving Behavior Report



Driving Score : 88

Driving duration : 00:15:35

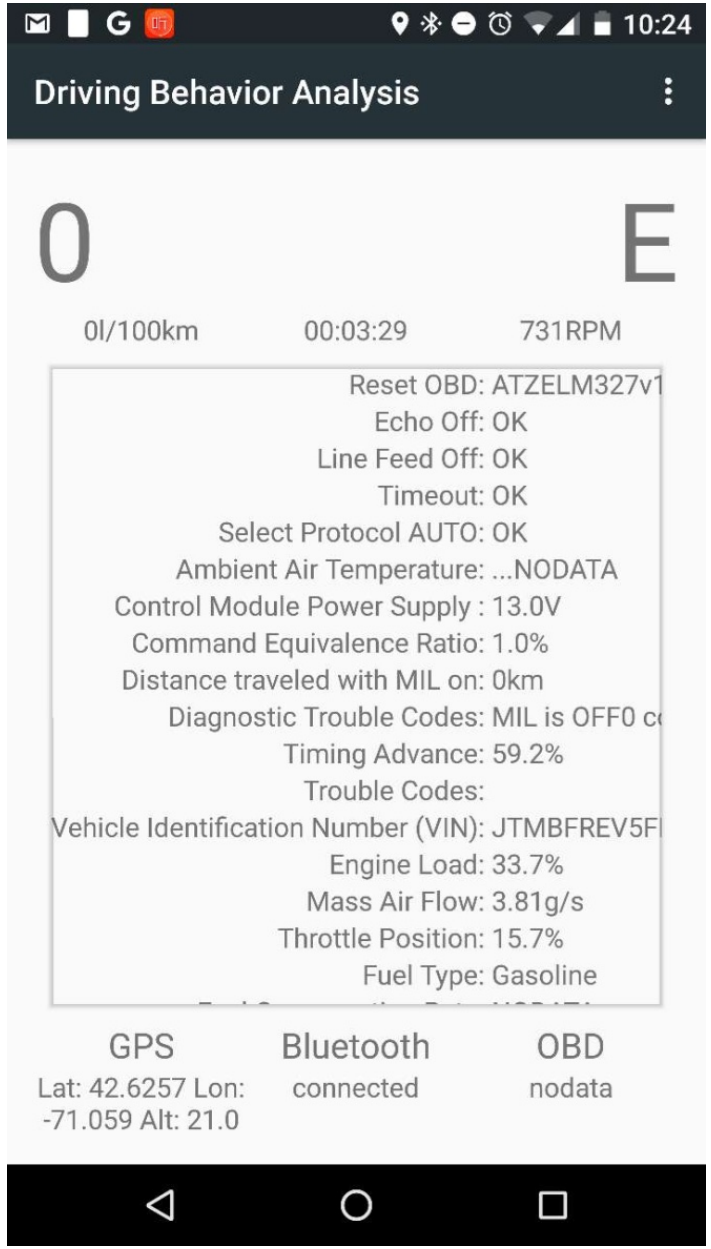
Max speed : 86km/h

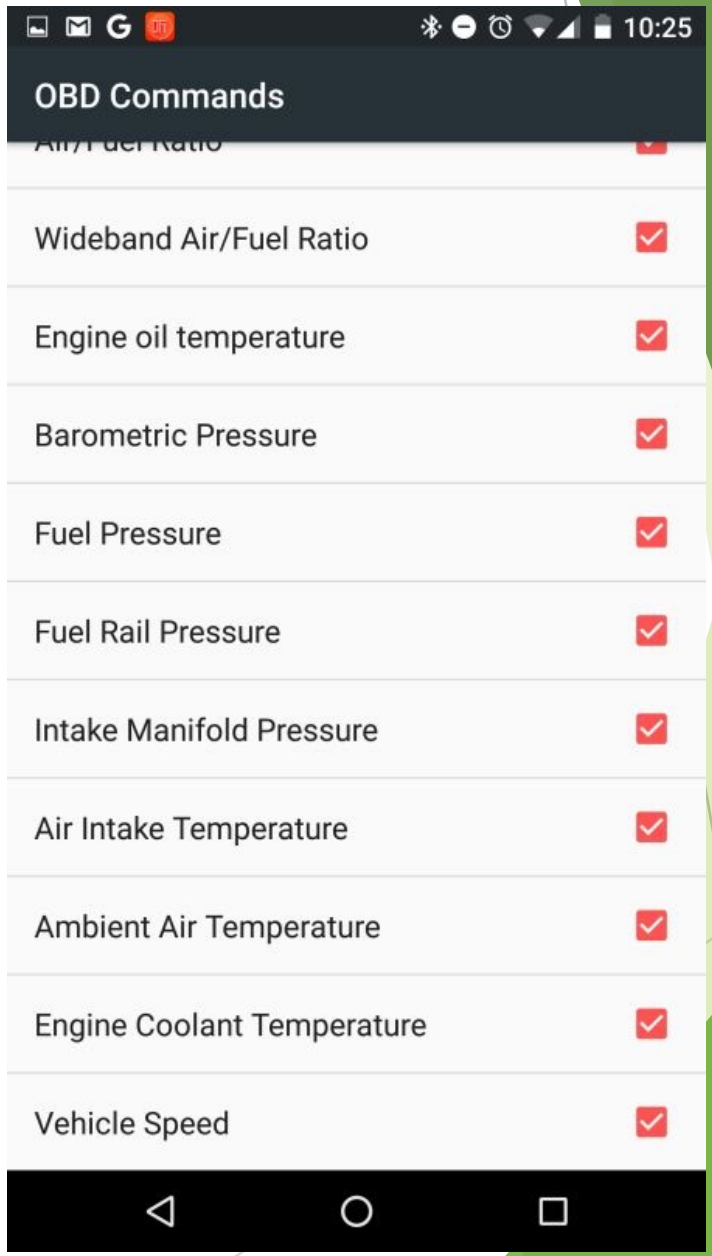
Full stop count : 11

Hard break count : 3

Exhibition of Speed count : 3

Demo


10:24
Driving Behavior Analysis
0
E
0l/100km
00:03:29
731RPM
Reset OBD: ATZELM327v1
Echo Off: OK
Line Feed Off: OK
Timeout: OK
Select Protocol AUTO: OK
Ambient Air Temperature: ...NODATA
Control Module Power Supply : 13.0V
Command Equivalence Ratio: 1.0%
Distance traveled with MIL on: 0km
Diagnostic Trouble Codes: MIL is OFF0 c
Timing Advance: 59.2%
Trouble Codes:
Vehicle Identification Number (VIN): JTMBFREV5F
Engine Load: 33.7%
Mass Air Flow: 3.81g/s
Throttle Position: 15.7%
Fuel Type: Gasoline
GPS
Lat: 42.6257 Lon: -71.059 Alt: 21.0
Bluetooth
connected
OBD
nodata


10:25
OBD Commands
Wideband Air/Fuel Ratio
Engine oil temperature
Barometric Pressure
Fuel Pressure
Fuel Rail Pressure
Intake Manifold Pressure
Air Intake Temperature
Ambient Air Temperature
Engine Coolant Temperature
Vehicle Speed

Video Demo

https://youtu.be/IDerP381ssE

Online Report

http://weblab.cs.uml.edu/~zlu/DrivingBA/Server/analyse.php

Big Picture

- More accuracy data analysis algorithm
- Find a way for calculating driving behavior score
- Collect auto health report(Machine Learning Algorithm)
- Could be useful for insurance company