

CDR Presentation SmartWheel

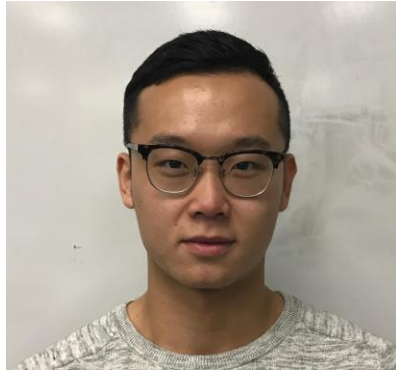
Bingjun Wang
Yaroslav Burdin
Bingze Li
Jack Tam

Department of Electrical and Computer Engineering
March 10, 2017

Team Members



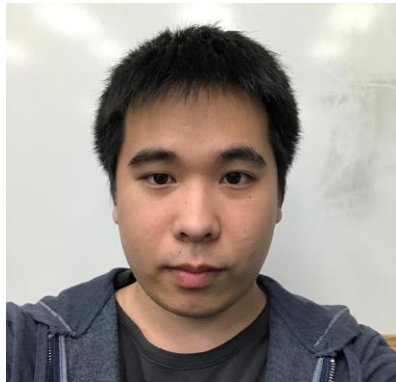
Advisor
Lixin
Gao



Bingze
Li
EE



Bingjun
Wang
EE



Jack
Tam
CSE



Yaroslav
Burdin
CSE

Review of MDR

SmartWheel Functionality?

- Monitor car acceleration. (accomplished)
- Send message to registered phone with coordinates when acceleration reaches certain level. (accomplished)
- The app could extract the coordinates from message and show it on map. (accomplished)
- A home-box could gather and sort the driving history. (CDR)

For whom the SmartWheel is designed?

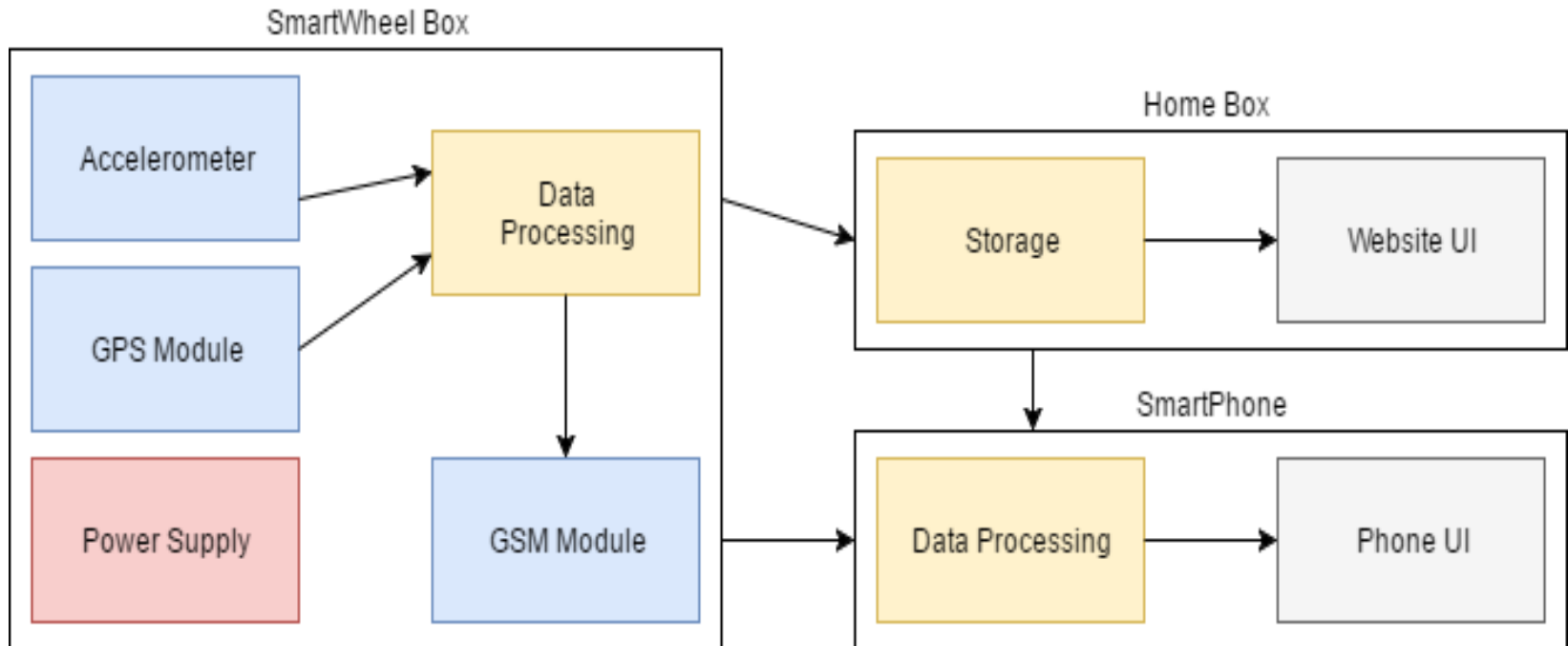
- Parents
- Insurance companies

CDR Deliverables

CDR:

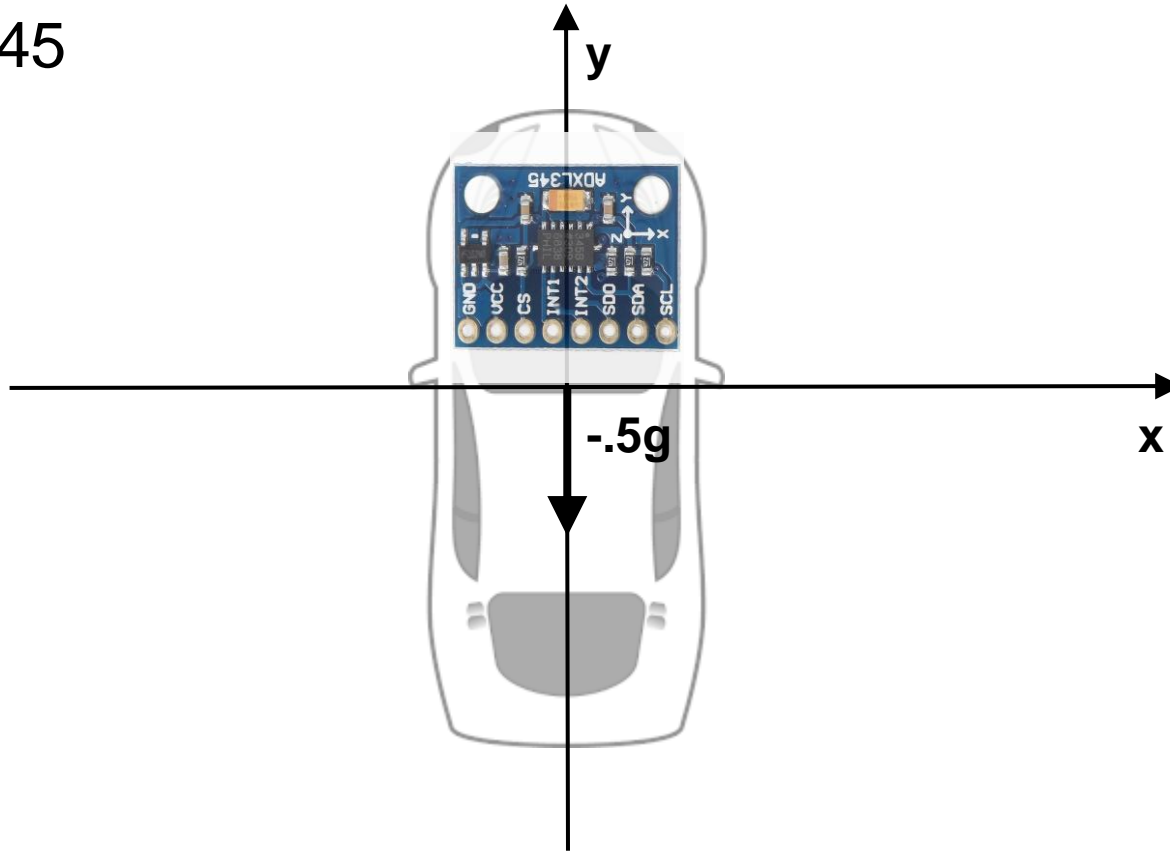
- New approach to accelerometer
- Power supply completed
- HomeBox Setup
- Data Transfer between SmartWheel Box and Home Box
- Build Local host

Block Diagram



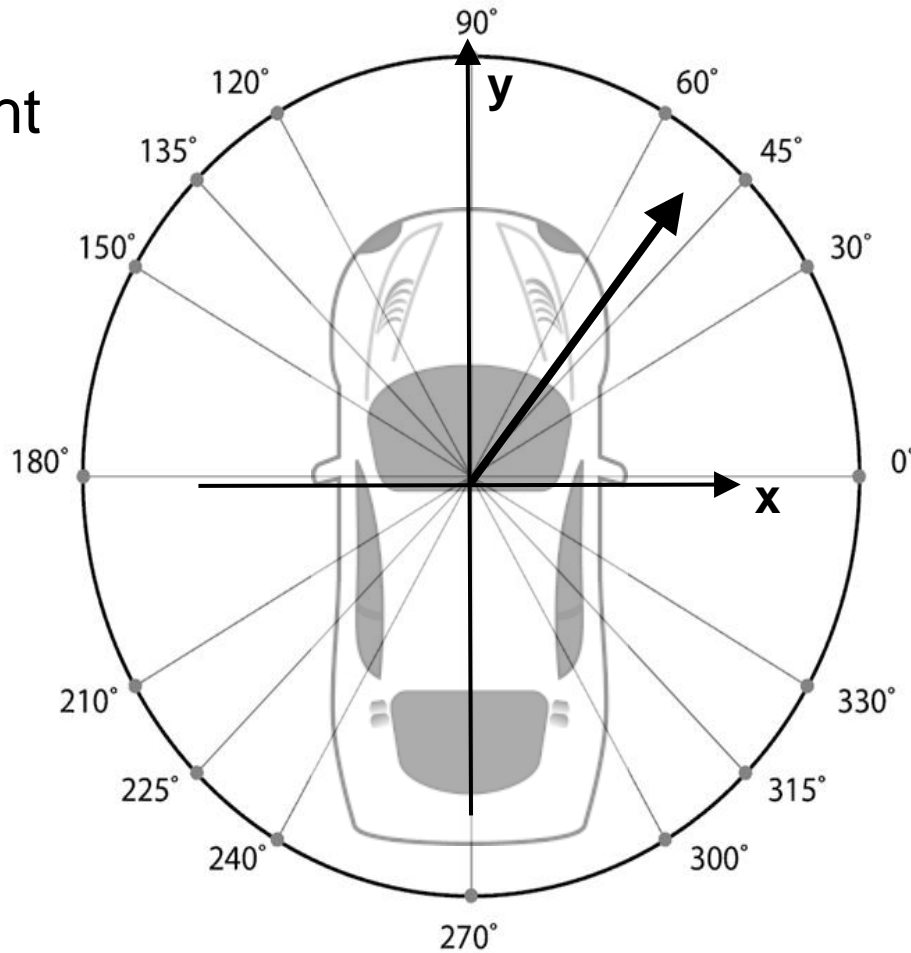
New Approach: Accelerometer

ADXL 345



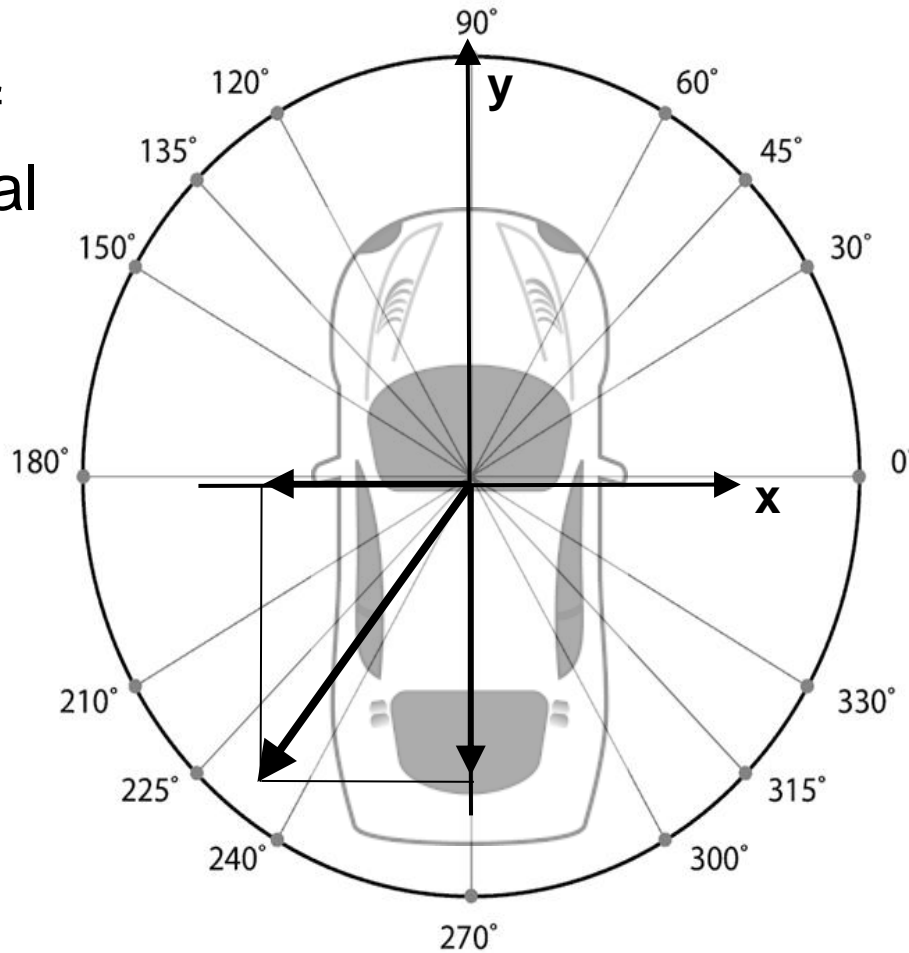
Accelerometer

Take a Right
Turn

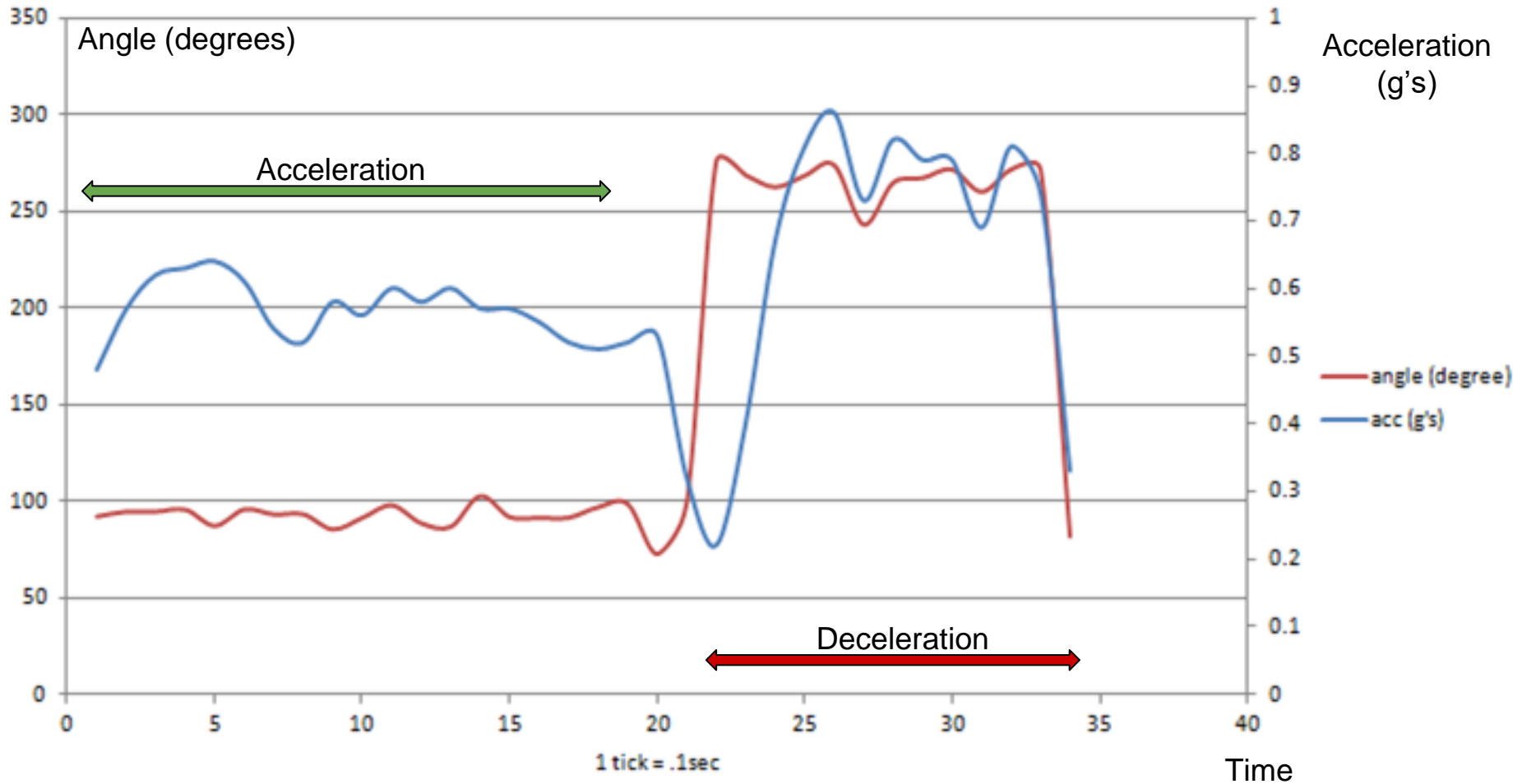


Accelerometer

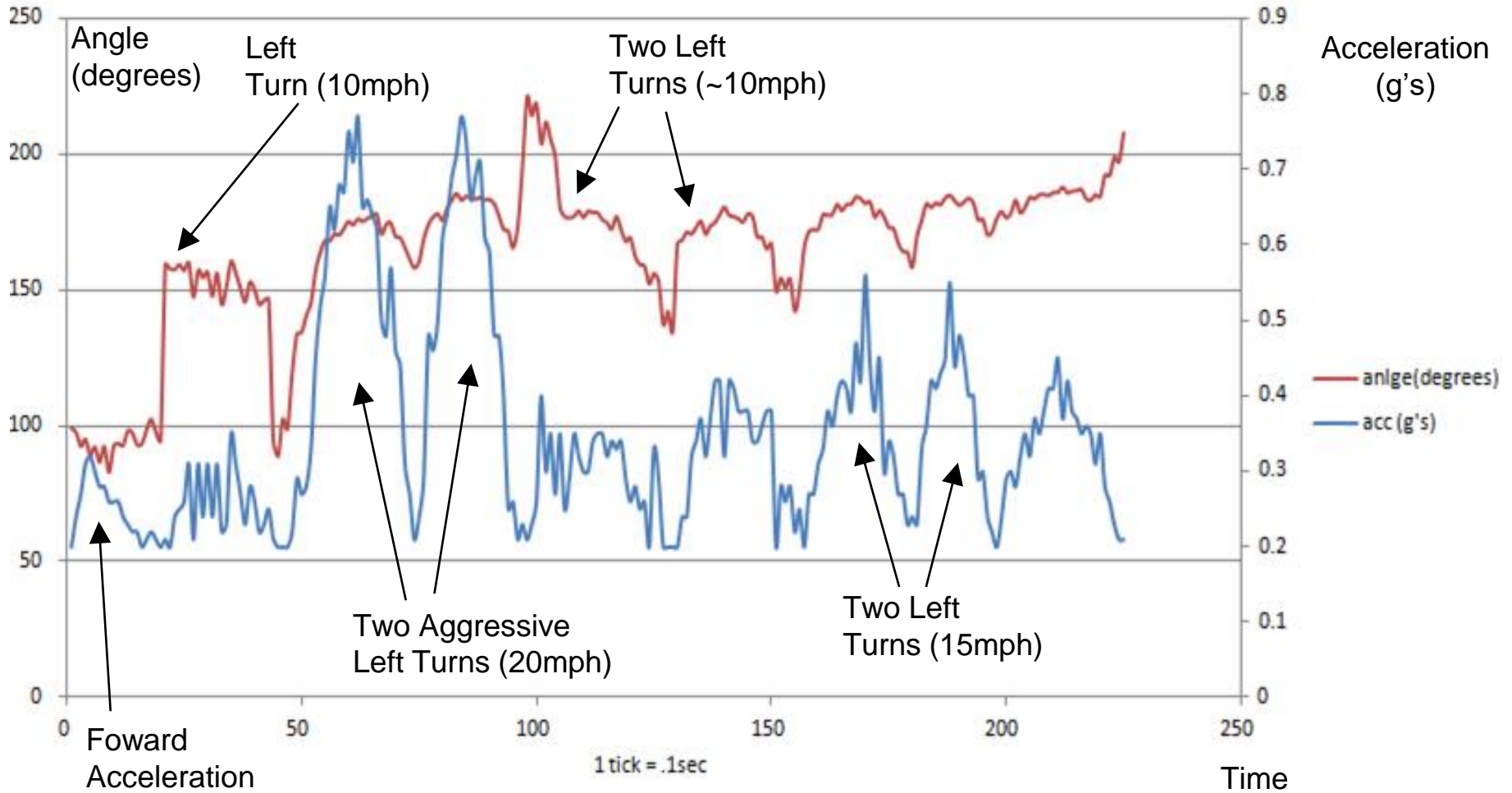
Direction of
Gravitational
Force



Dangerous Acceleration/ Deceleration



8 Left Turns



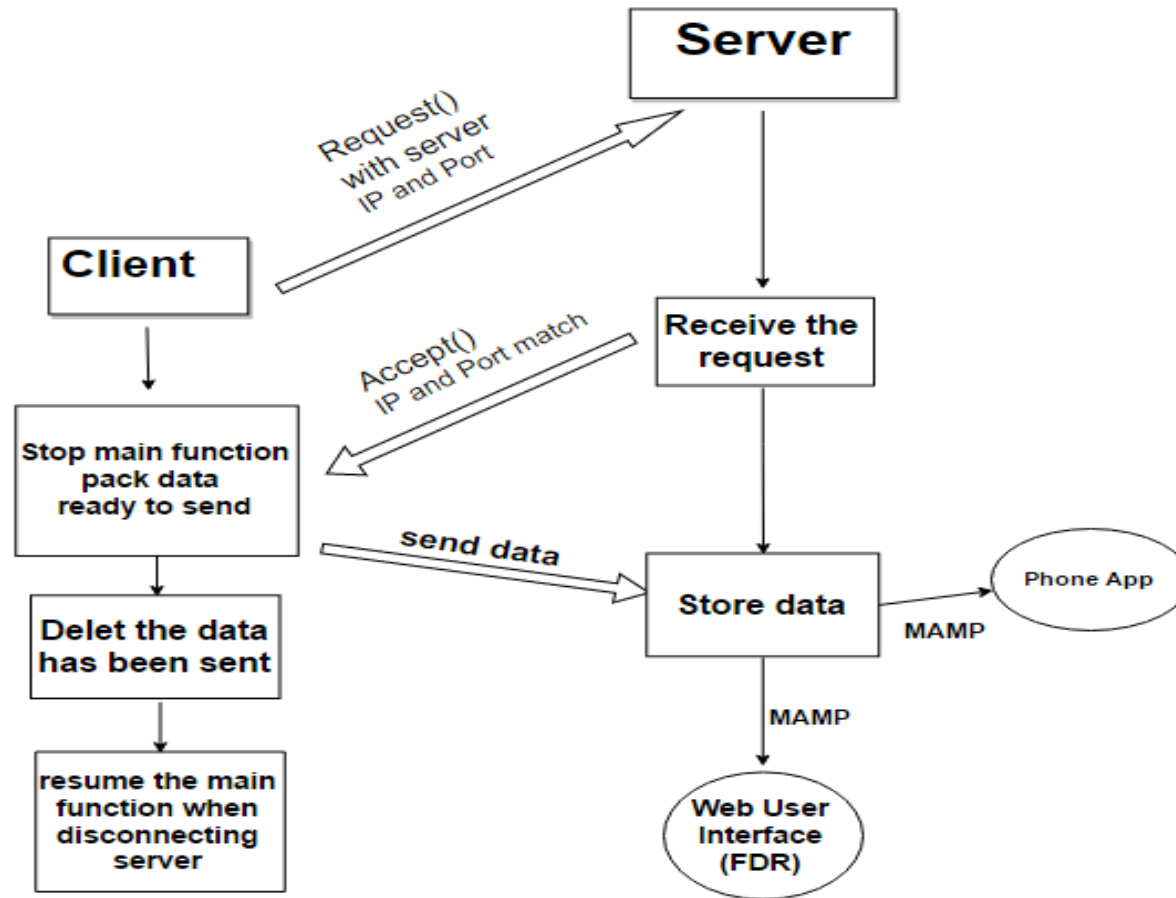
Home Box (local server) Overview

- 1. Set of code that runs on home PC or Laptop
- 1. devices in the same local network (wifi) could share the history data.
- 1. auto connection, auto data transfer.
- 1. client clear history data after transferring
- 1. phone application apply on server.

Network Socket



Data Flow Block Diagram



MAMP (Local host)

1.Free

1.Share History Data with other devices

1.IP address is unique and safe



Power supply

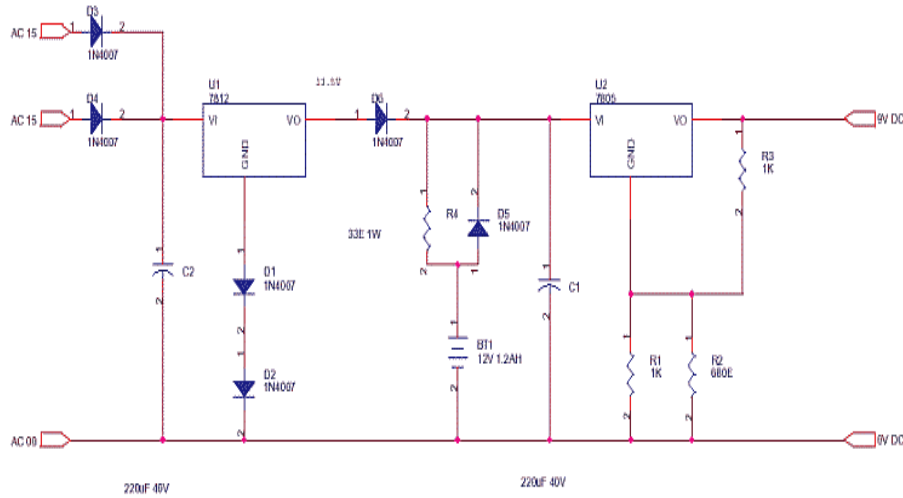
Requirement

- Provide 5.0V to Raspberry Pi from car
- Rechargeable battery
- Continue work when the car turn off

Accomplished

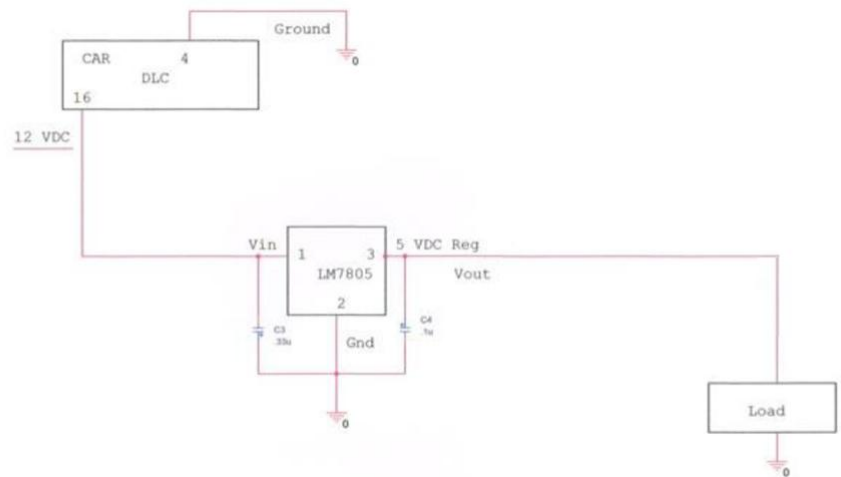
- 5.0VDC delivered to Raspberry Pi
- Easy rechargeable battery
- Continue working for 2 days

Circuit VS portable charger



Rechargeable circuit

Voltage adapter circuit

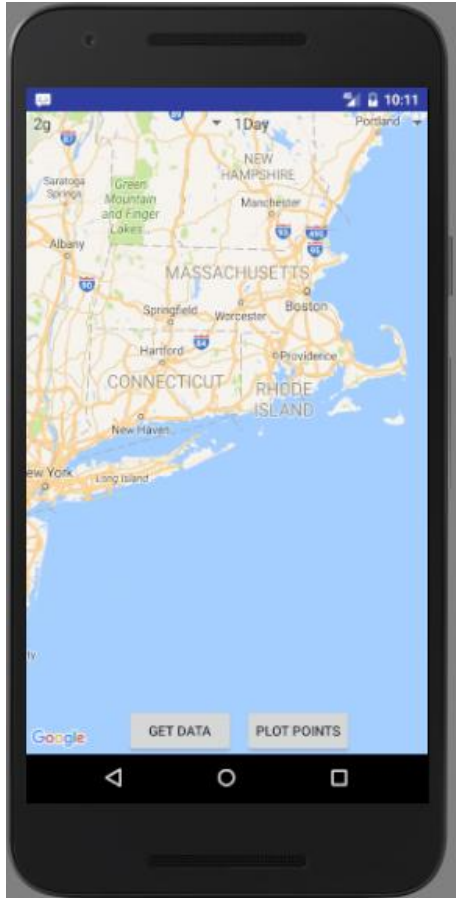


Circuit VS portable charger

- Output voltage is 5VDC.
- Easy recharging
- Small Volume
- Stable power provider



App Interface



Two dropdown menu

- First one selects the acceleration.
- Second one selects date.

Two Buttons

- Get Data button connects to server and retrieves data
- Plot points button places markers on map that meet the selected fields.

Gantt Chart

			1	2	3	4	5	6	7	8
Task	Weeks	Duration	12-Mar	19-Mar	26-Mar	2-Apr	9-Apr	16-Apr	23-Apr	30-Apr
Make Case	1-3	3	█							
Multiple Users	1-4	4	█							
Improve Functionality	3-5	3			█					
FPR Presentation	4-6	3				█				
SDP Demo Day	7	1							█	
Final Report	6-8	3						█		

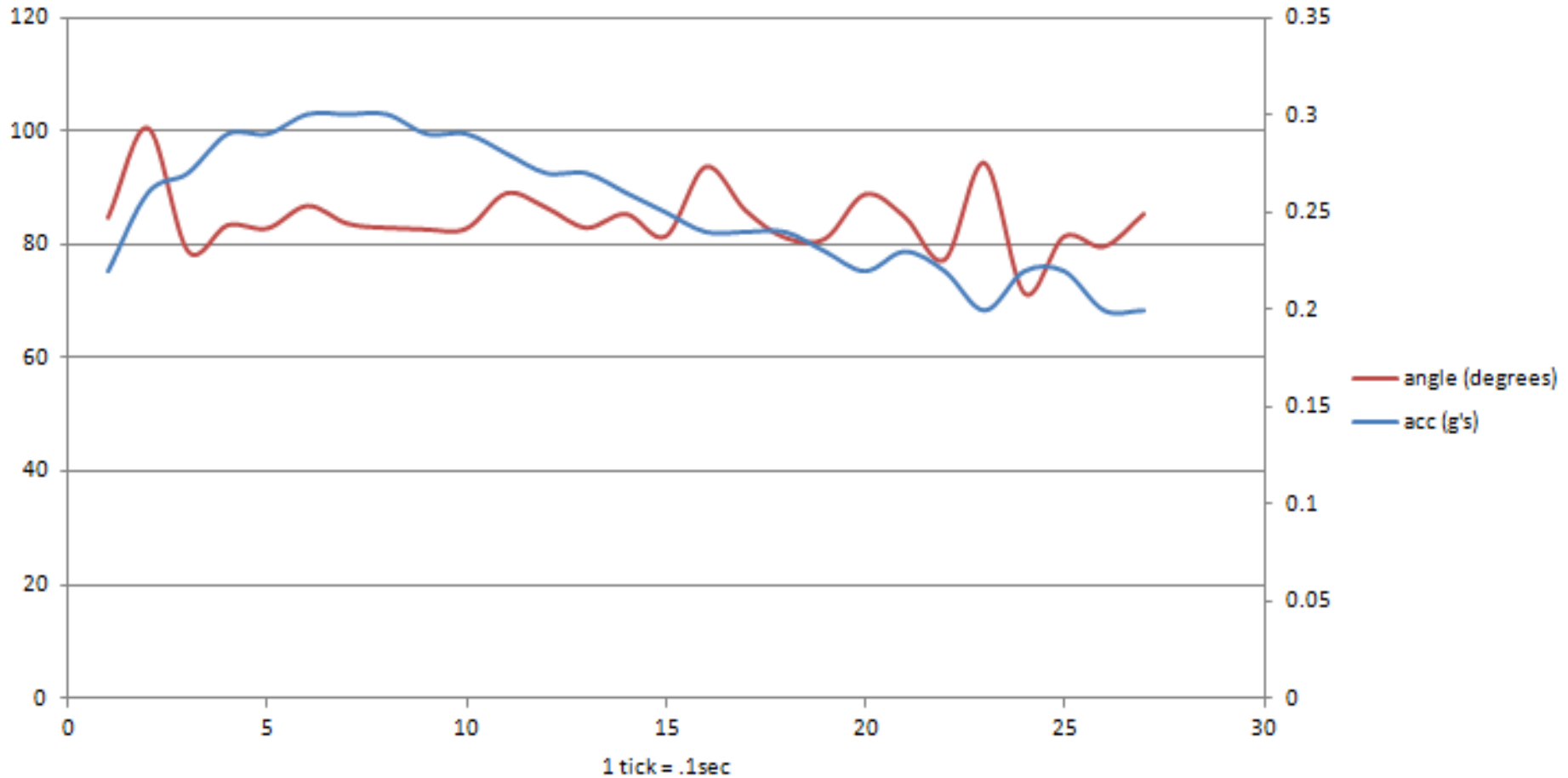
Proposed FPR Deliverables

Fully integrated system that includes:

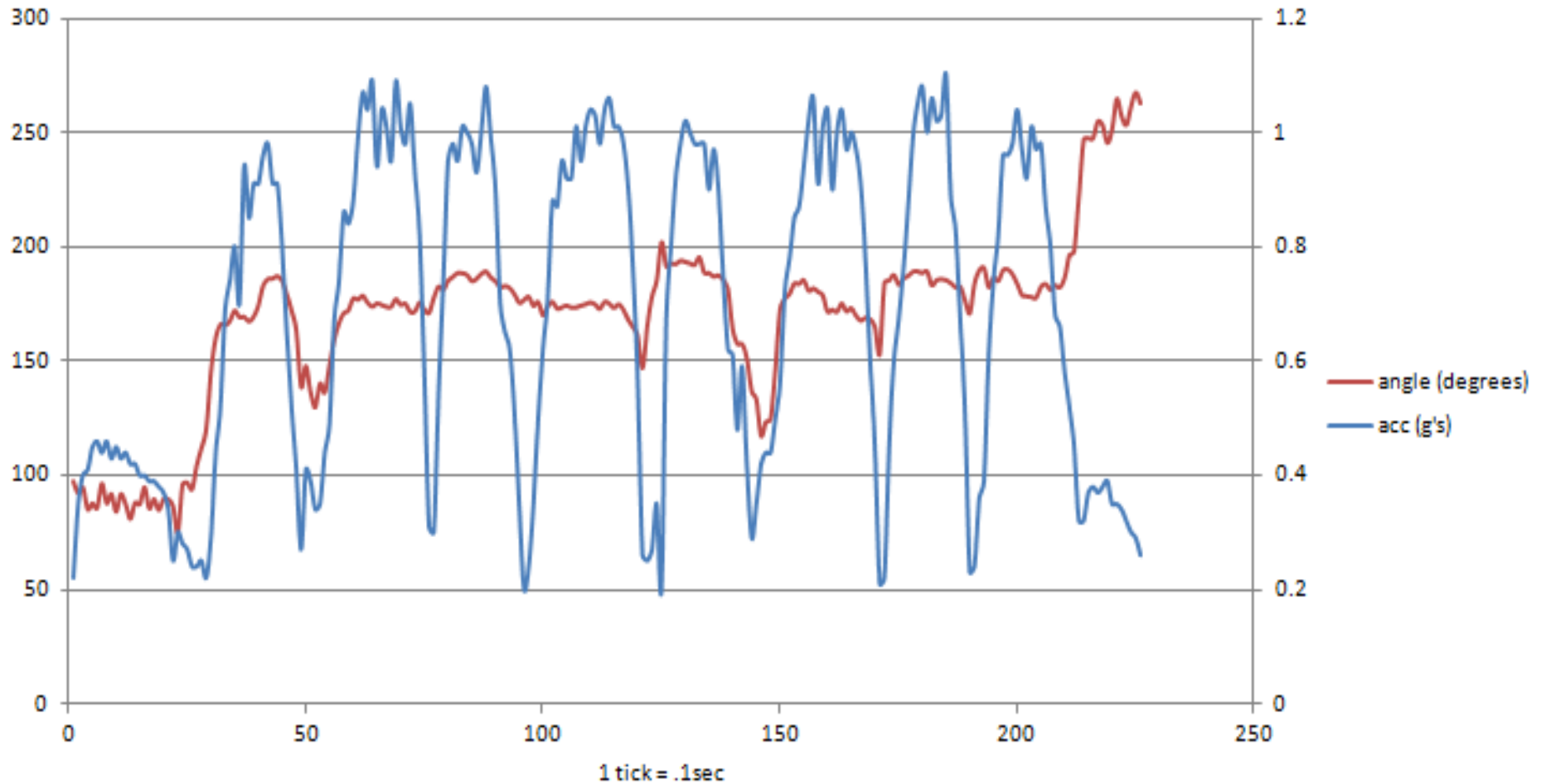
- Data Server
- Smartphone Application
- SmartWheel Box

DEMO

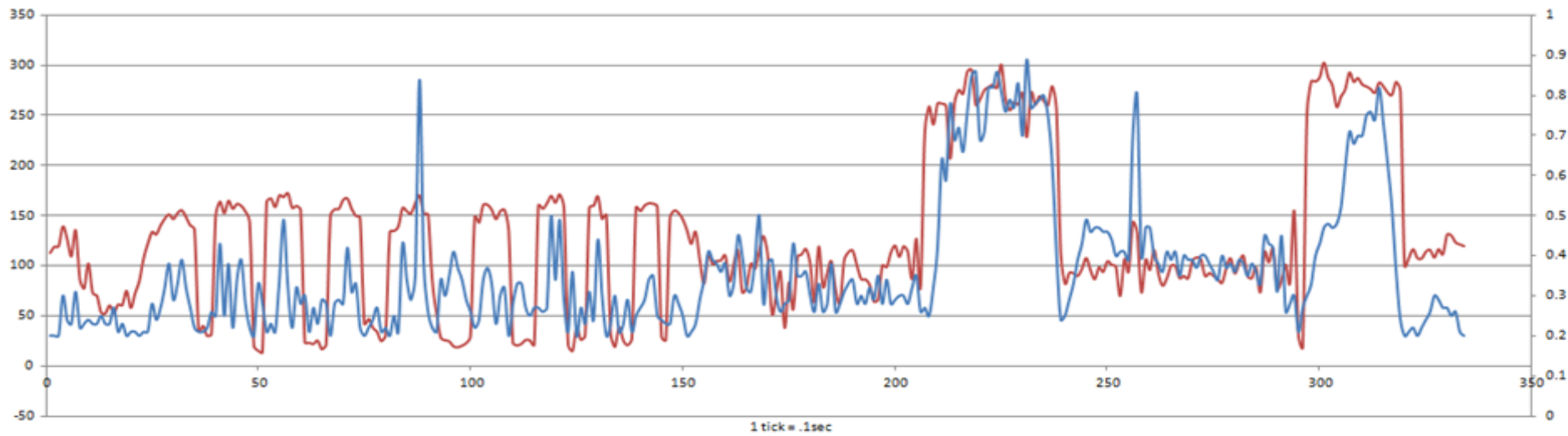
Safe Acceleration



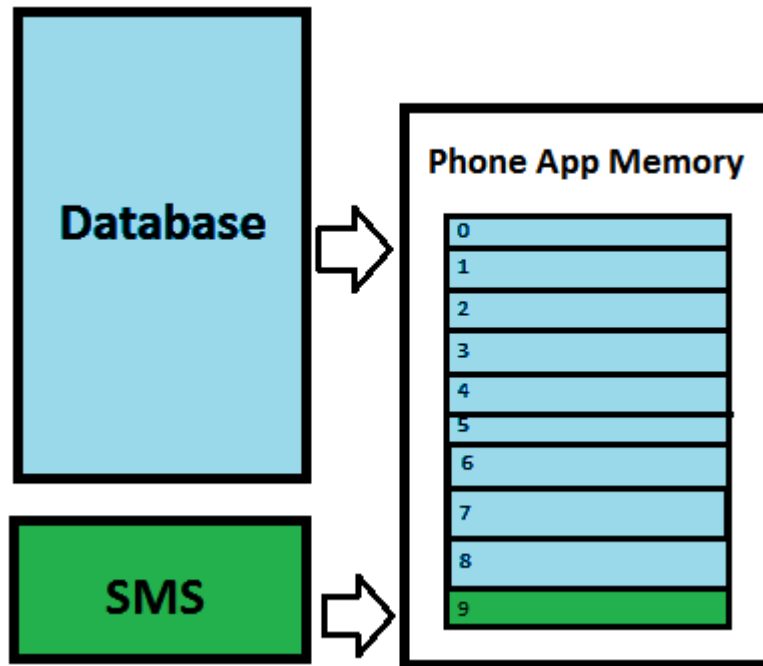
Dangerous 8 Left Turns



Wiggling, Dangerous Acceleration/Deceleration



Phone App



- Programmed in java using Android SDK
- Uses the Google Maps API
- Plots the most recent 10 points in which a the acceleration went past a designate value.
- The 10 points are taken from both the list and from text messages

Gantt Chart

