

CSAT - Car Safety Assessment Tool

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Problem Statement

Measurement of Movement

Positioning of Vehicle

Where it is on the Map





Motivation



- Assess how safe a driver is
- Help the driver become a safer driver



Design

- Raspberry Pi
- Google Maps API
- Accelerometer(ADXL345)
- Gyroscope(L3GD20H)



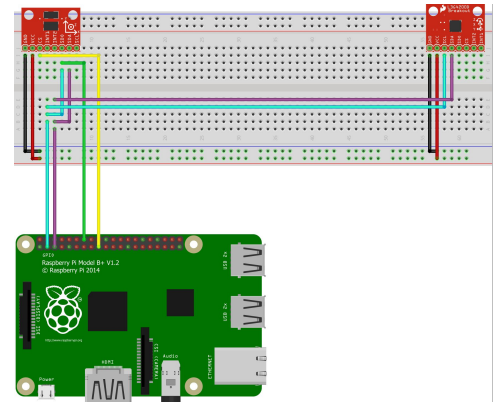


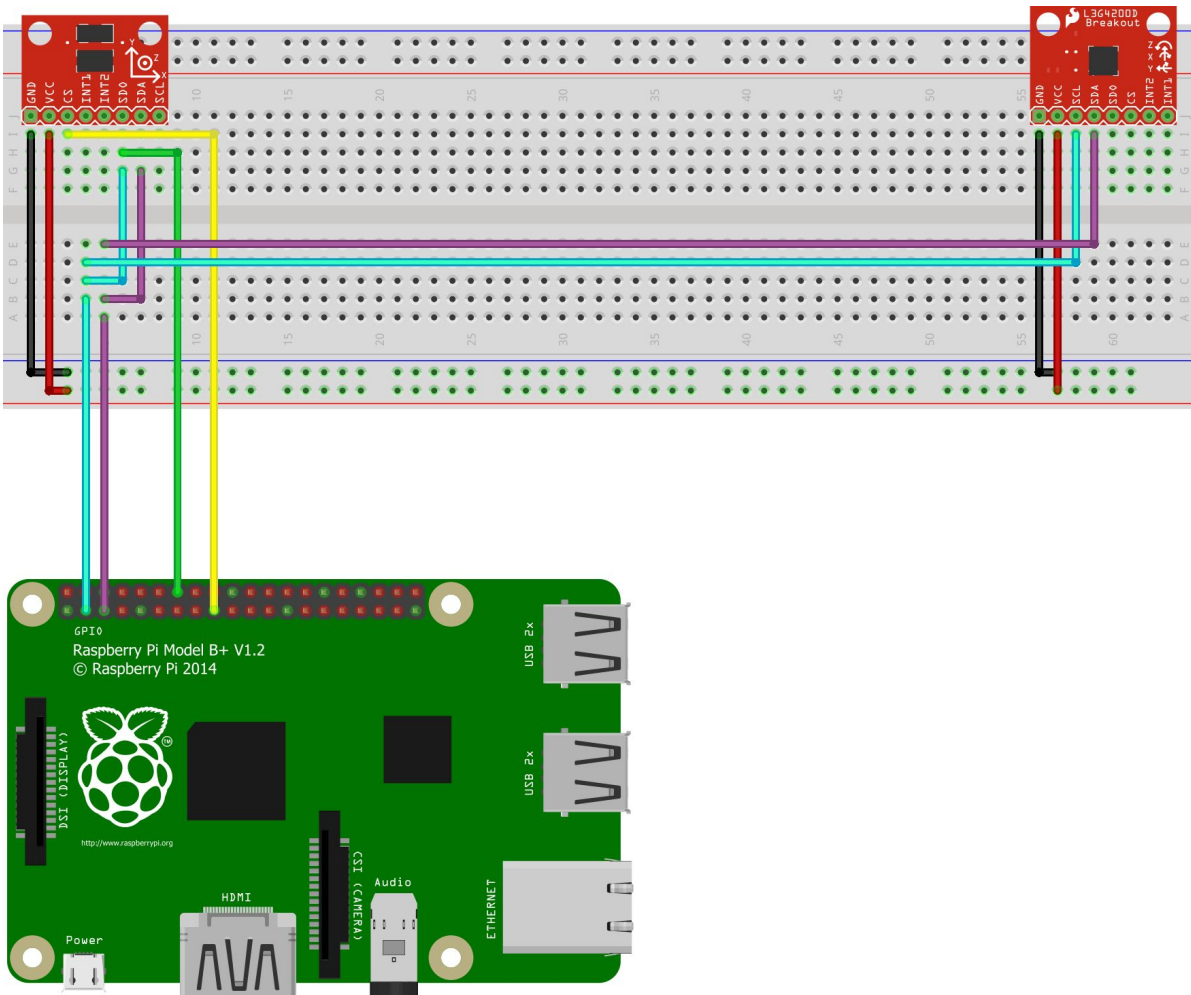
Ideal Model

- Raspberry Pi uses I2C Interface to interact with the sensors

Sensors: ADXL345 Accelerometer & L3GD20 Gyroscope

- The circuit will be powered via the automotive power socket
- Device will be placed on dashboard of vehicle (leveled)

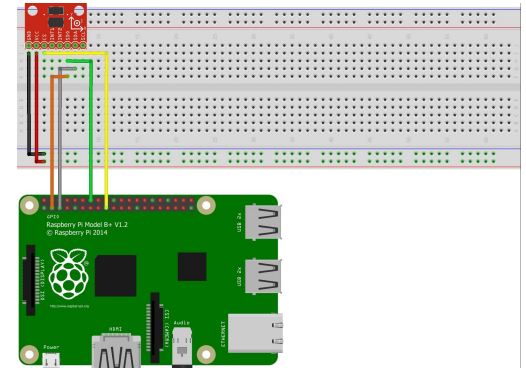


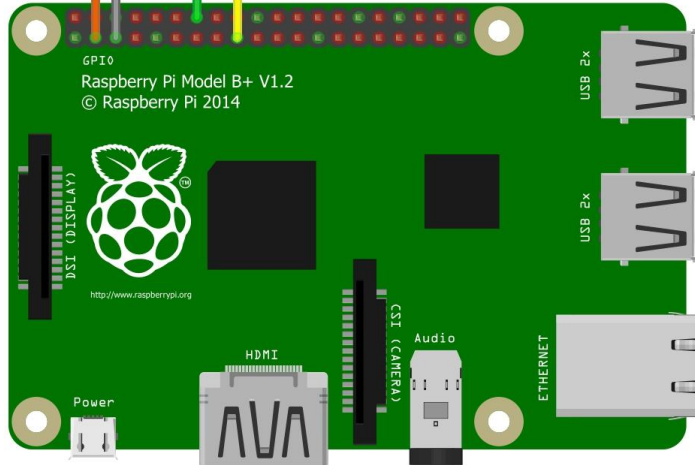
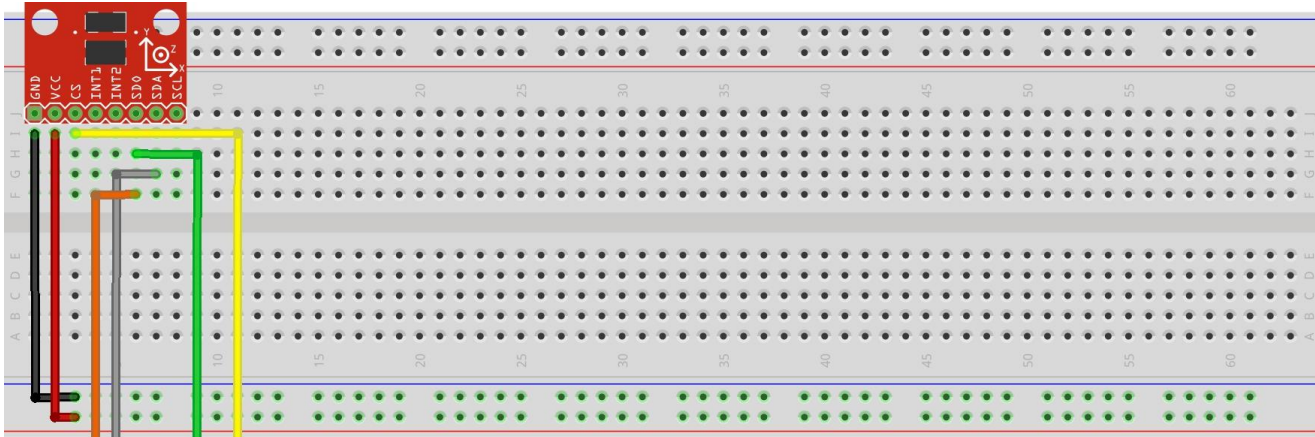




Reality Model

- Only able to implement the ADXL345
- Could only calculate the acceleration
- Only able to store acceleration data







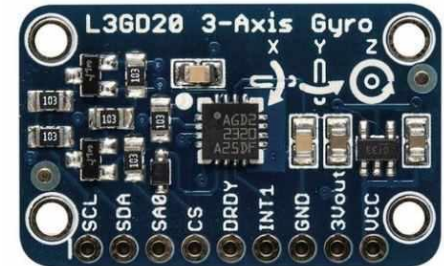
Google API Issues

- Difficult to use
- Requires knowledge on implementing APIs
- Costly (Requires credit card for verification and has a limit trial)
- No API for C++



Gyroscope Issues

- Originally intended for use in the system
- Was intended to be used in conjunction with Google API
- Was difficult for us to get meaningful values



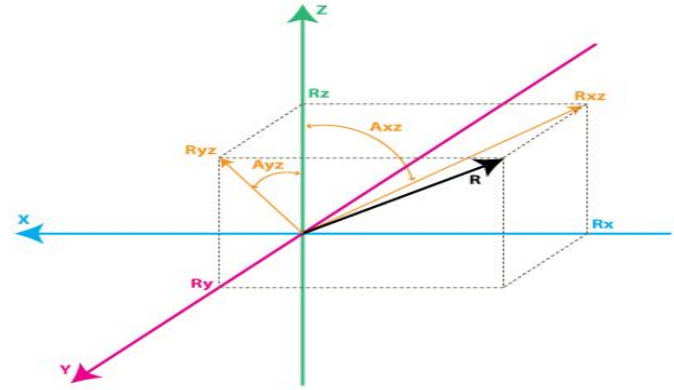
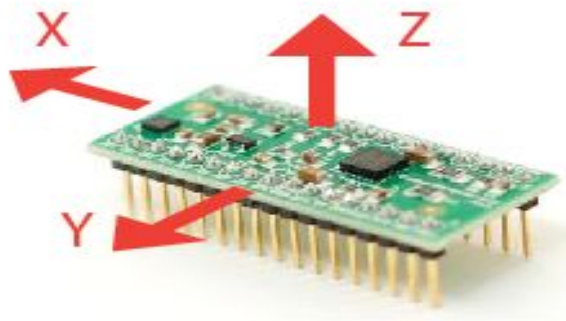


Compromise

- Google API struggle
- Gyroscope struggle
- Solution:
 - Have at least one functional component



Issues





ADXL345 Accelerometer

- ADXL345 was implemented
- ADXL345 produced values which were meaningful to our project
- Ability to output the speed of the vehicle

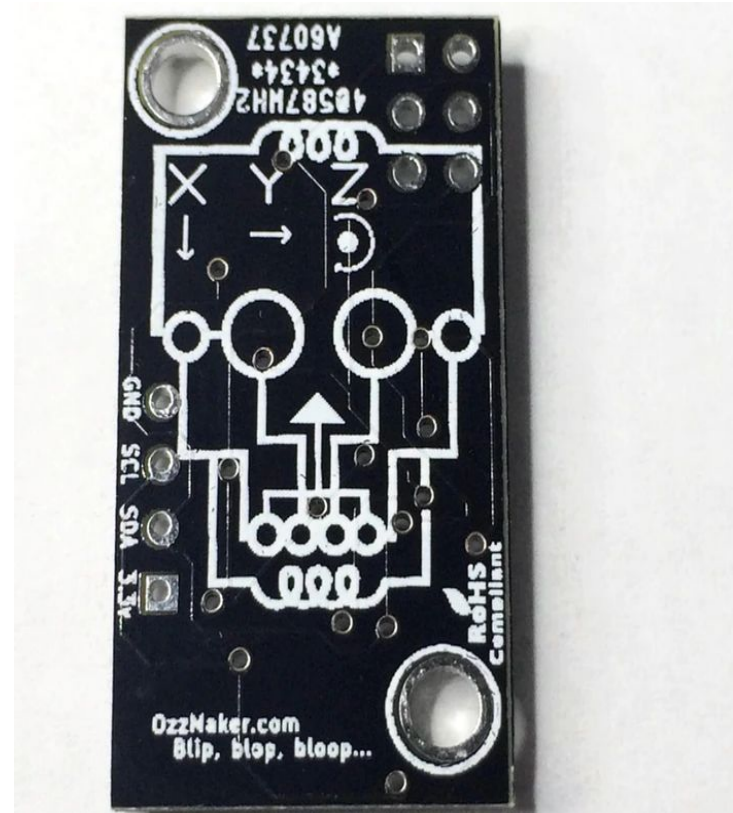


Solution

BerryIMU

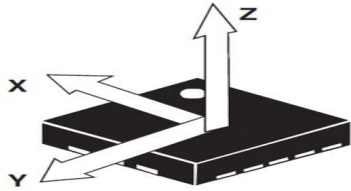
Combines both the accelerometer
and gyroscope

Provides online guide

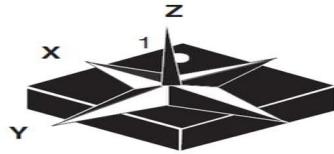




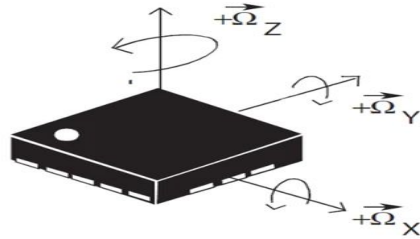
Conclusion & Analysis



Accelerometer



Magnetometer



Gyroscope

- Very ambitious idea
- Good idea to search for alternatives in the beginning
- One-third successful (successfully implementing the accelerometer)