ACE Device Functionality

# Core Functionality

The core functionality of the device includes:

1. Record journeys in car with GPS;
2. Dashboard online service (upload to web server)
3. Economic Driving
4. Can check detailed information like pistons
5. Compare friends results (back end, web server)
6. Real time display what we have on the raspberry pi

## GPS Record Journeys

We intend to have a GPS receiver component as part of our device that will be able to feed co-ordinates so that a map of the route taken can be drawn. The GPS receiver will start as soon as the device is connected to the car.

This will allow us to pinpoint certain events on a map. The colour of the route will gradually change depending on how economically you were driving. This is a similar idea to the route colouring technique used in the Nike Running app:



[REF] http://fitfeat.com/blog/wp-content/uploads/2013/08/nike-app.png

This would easily show where the speed was greatest or where you were driving most efficiently.  
We plan to use a digital display for the real-time information so the actual map of route taken would have to be displayed on our web interface as the digital display would not be able to handle this.

## Dashboard Online Service

The idea is that when drives have been recorded, the device can be connected to the Dashboard Online Service web service and upload all the information gathered. As a user you will be able to log into the web service and view the analysis of your drive or all of your drives.

You will be able to view statistics for individual drives and the route for each will be plotted onto a map. There will also be a screen of general statistics and averages of all your drives.

## Economic Driving

One of the main themes of the project is economic driving and we want to be able to tell the user how economic their driving is.

In our opinion there are two main factors in uneconomic driving. The first is in braking too harshly; this would be represented as a sudden decrease of speed from the data collected during a drive. The idea is that speed change should be gradual and planned. This is also the case for the second factor which is whether or not you are revving too much. Over revving can be detected by comparing the rev counter value against a maximum rev.

We will use these factors to provide feedback to the driver on how they could drive more efficiently or tell them if they are already driving at optimum efficiency.

An Economic Driving Score will be calculated based on all the drives by a single driver.

## Detailed Information

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## Compared Results

There will be a table on the Online Dashboard Service that allows you to compare your general statistics and your economic driving score to others who have used the device.

## Real-time information

We want to show real-time information as you are driving. Information should be shown on an LED display detailing:

1. Current miles per hour (MPH);
2. Current miles per gallon (MPG);
3. Fuel intake; ?
4. Miles driven in current drive;
5. GPS co-ordinates of the car.

This information should be scrolled across the LED screen in sequence. This information should not be distracting.