Android ECU Programmer

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Description:

Cars can be tuned using a Programmer connected to their OBDII port. Using this method one can view information on a car such as mileage, mpg, fuel consumption and error codes. One can also change the air/fuel ratio, timing and many other parameters to change the performance of a vehicle whether it be for better fuel economy or for more speed. This method is called MAPPING the ECU and many programmers come with pre-loaded MAPS. Some of the more expensive Programmers also come with a very graphical touch screen user interface. However this method is very expensive and it adds a big piece of equipment that one need to add to ones vehicle.
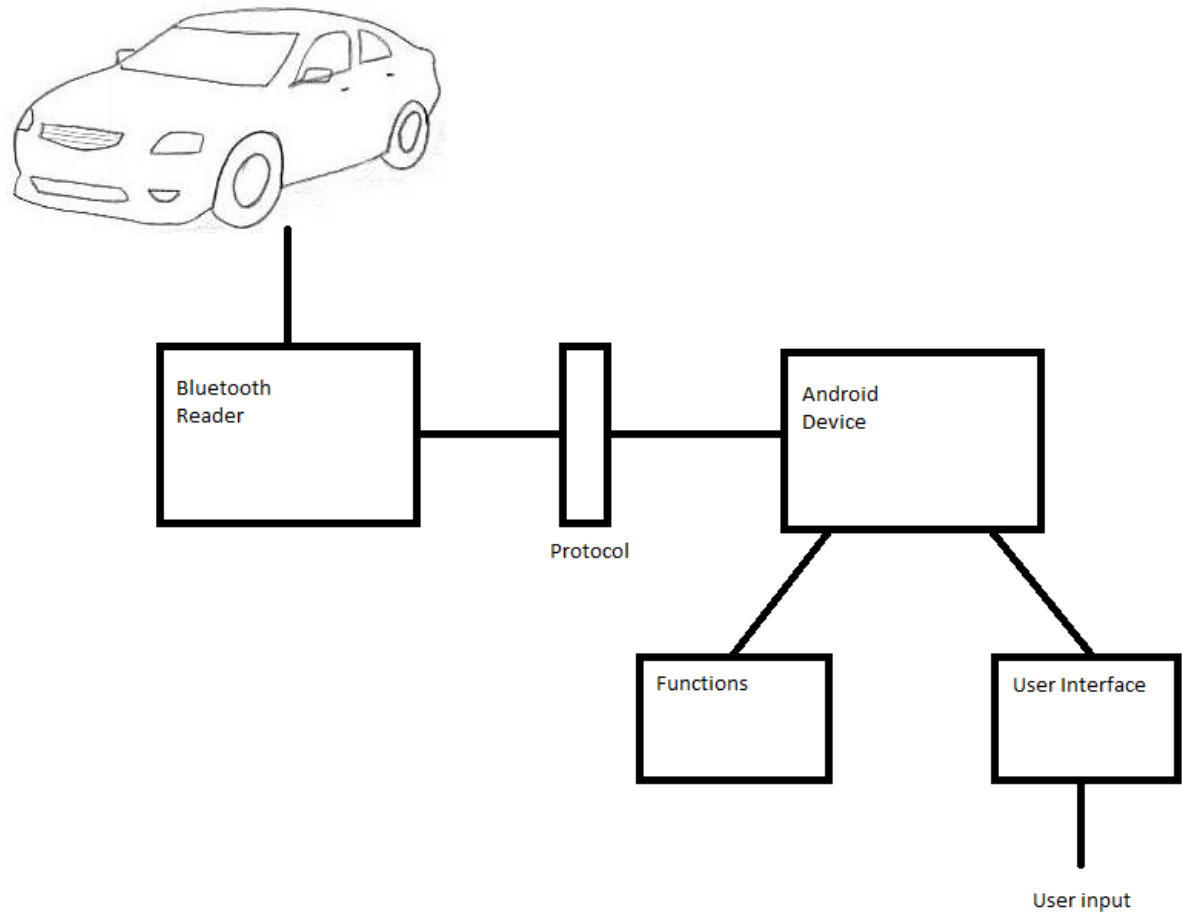
I propose that we use an android phone to replace the Programmer that connects to the OBDII port. And I also propose that this be done wirelessly and information may be sent wirelessly via ad-hoc or Bluetooth connection. This way one can tune their car on their android phone and look up trouble codes and how to fix them using the android phone connected to the internet. The user may also enter a Programming mode so they may tune their car for performance or economics through the user-interface. This will be a much cheaper and efficient way of modifying and keeping track of information on the user's car. The Programmer

will be able to do tune options such as removing the top speed limiter, changing the timing of the engine, remove the rev and speed limiters, and erase error codes. The system may also be able to start the car, wind down the windows and change the climate control depending on the vehicle. A final feature of the Programmer will be able to monitor functions such as rpm, temperature, mpg, error codes, voltage, fuel level and others.

Specifications:

- Work for cars after 1996

- Bluetooth device to be no larger than 6"x4"

- Connect to device within 2 minutes of starting connection

- Be able to save up 3 to different MAPS

- Tune the timing +/- 2 degrees

- Remove 155 mph speed limiter

- Performance MAPS should add at least +5 hp.

- Economic MAPS should create a gain of at least +1 mpg.

- Be within the 100 dollar price range.

Block Diagram

1. Blue tooth reader: situated in car, forms a connection between android device and car.
2. Protocol: interprets and converts wireless signal from cars OBDII port and passes to android device.
3. Android device: takes signal from blue tooth reader and sends/receives data with user interface.
4. User Interface: takes inputs from user and sends/receives with android device.
5. Functions: takes instructions from android device and sends data back to car to perform some sort of action.

Project Budget and Financing:

- Scanner/Adapter parts (PCB, Bluetooth module, etc.)- ~$30

- Pre-made scanner for testing - ~$30

- Android development tools (Eclipse, ADT) – Free

- Android phone – Free (already own)

- Self-Financed (Each member willing to contribute up to $50; $200 total.)

Project Milestones:

Spring 2011

- Figure out how all of the individual components of the project will interface together to ultimately perform the functions desired.

- Design the circuit for the OBDII reader. This milestone will include the research required to figure out what company we will have our prototype made by.

- Become familiar with the Android platform, including practice applications that will function on an Android based mobile device.

- Learn the basics of Bluetooth technology and how to implement this technology into our OBDII reader to be able to communicate with our mobile device.

- Learn the exact information that can be retrieved through an OBDII reader from the car that our project will be tested on. This information will ultimately decide what functions we can and cannot in our project.

<u>Summer 2011</u>

- Build the OBDII reader and make sure that it's compatible with the car.

- Write and debug the Android application.

- Connect and test the ODBII and application together via the Bluetooth technology capabilities.