

Ain Shams University
Faculty of Engineering
Mechatronics Dept.



Mainstream Undergraduate Prog.
MEP382 – Measurement Systems
Spring 2016

Course Project

OBDII Transceiver

1.0 PROJECT DESCRIPTION

Cars will soon be one of the things connected “things” under the IoT umbrella. Cars will have their data measured, analyzed and displayed to give information to many stakeholders to improve drivers’ driving behavior, cars’ efficiency, fuel usage, road infrastructure, driver/pedestrian safety. Newer cars will come with built-in instrumentation measuring the cars’ vitals and sending it out to private networks. The goal of this project is to build a device that does the same for existing cars.

2.0 PROJECT REQUIREMENTS

In this project you will design an OBDII transceiver that

- interfaces with the Car’s ECU using the OBDII port and CAN bus.
- will read three different PID values related to the vehicle.
- will have a GPS to indicate the vehicle’s location.
- will have an IMU to record the vehicle’s linear and angular acceleration and speed.
- can connect to a mobile phone via Bluetooth and using a mobile app that you will develop, you will display all of the above data.
- [Bonus] Bonus points will be given to more data (than above) being presented on the mobile app
- [Bonus] Bonus points will be given to more innovative ways to display the data
- [Bonus] Bonus points will be given to analysis being performed leading to conclusive metrics that aids any of the stakeholders
- [Bonus] Bonus points will be given if the transceiver is #G enabled so that a 3G connection is to send data to a backend server that later pushes the data to the displaying mobile app

Students can be divided into groups of **3-6 students**; each group should deliver all requirements stated in section 3.

3.0 DELIVERABLES

In this project, students should deliver:

- A printed report that contains the system design, rationale for the devices to be used, PCB layouts, implementation details and a conclusion summary.
- A working PCB-based prototype of your project.
- A mobile app that displays the data being collected from the OBDII transceiver.
- A CD that contains all code developed for the OBDII transceiver and the mobile app.

The final report & the actual prototype+app will affect your grades; so each group should be keen on doing their best.

The project is divided into timely milestones that are summarized below. Students should strictly follow these deadlines or else you could lose project grades.

Project Deadlines & Grading Percentages:

- Saturday April 9th (Week 8): Teams formed and sent in an online google sheet. [0%]
- Thursday April 14th (Week 9): Initial system level design submitted in reports. [15 %]
- Thursday April 21st (Week 10): Students receive feedback on their designs from TAs and then they implement breadboard designs and test them in lab. [15 %]
- Thursday April 28th (Week 11): Students implement on PCB and test the circuits on actual cars. A video will be submitted with their demo/test. [15 %]
- Thursday May 5th (Week 12): Final report submitted. [15 %]
- Thursday May 12th (Week 13): Live demo of project along with a video showing it working on a driven car. [40 %]