Design Project 3

DP3: Internet of things - “Smart Cities”

The ultimate goal for Design Project 3 is to create a storyboard that demonstrates your concept.

This project is assigned in four parts:

Assignment                                              Due at 11:59 pm on

**Problem Statement December 05, 2019**

**Storyboard  December 12, 2019**

Part 1: Problem Statement

**Due**: **December 05, 2019** by 11:59pm

**Points:**  15

**Submitting:**  a file upload

Describe the problem.

Your first deliverable for DP3 is to write a one or two paragraph problem statement. It identifies and describes a “city wide” problem that can be fixed with an “internet of things”, VR, AR, or Voice Design type solution. As discussed in class, the solution will have three parts: 1) sensors or monitoring, 2) data processing and machine learning, 3) and output or action.

Focus in DP3 on the human-to-technology interaction, not on the technology itself. The technology is “automagical” and in a "black box" that just works. You don't need to worry about the "data and machine learning" implementation aspect. Rather, focus on the human to technology interactions to ensure they are possible and can be designed. Think about what sensors or detectors are needed to monitor the situation. Assume data communication, analytics and machine learning are available to optimize determine the actions taken to fix the problem. Then focus on the sensors and detectors and the action taken.

What to turn in for part 1

Turn in one or two paragraphs (up to one page) that describe the problem as you would describe it to the Mayor of the city. Describe why it is a problem, who is affected, and, at a high level, how the solution would work. Focus on what the solution does, not how it works.

For example, if we were doing a smart lamp:

**problem** -- I want to save energy, so I want a smart lamp that will be on only when I need it.

**who is affected** - This lamp will work with anyone living in the house and only when they are nearby where the lamp is located.

**solution** - This lamp will have sensors that monitor when it's dark, and when it's light, so it turns on and off automatically. During the times when it's dare outside, motion sensors will track when I'm in the room. It then turns lamp off after I leave and when I am not in the room. The lamp also has a manual override mode so I can keep the lamp on when I'm sitting in the room (this is an issue for lights in restrooms that turn on using motion detectors!). I can also do manual overrides remotely (via Alexa? Or on it's own? includes a smart phone app for remote control?). Machine learning tracks as days become longer or shorter and when I'm at home. It also may randomly turn on or off when I'm not home to confuse potential burglars. Perhaps the lamp learns when I want "ambient" light mode -- say when I turn on the TV. Perhaps it "follows me" as I move from the living room, down the hall to the bedroom to get ready for bed.

In class we will discuss our ideas and begin to brainstorm in greater detail how the solution will work. The goal here will be to go from problem statement to story board (which is the DP3, part 2 assignment!).

# Describe the problem

We are facing the big issuse of polluted air in many countries in the world and our small city is not the exception. Moreover, our country is in the developing process and there are huge quanity of vehicles are being used by all the citizens. Howerver, because of the big ammount of gas emission from vehicles, specially motobike due to increasing the carbon dioxit and it leads to many side-effects in the future.

The solution is not only use the bus to traffic, limit the motobikes on the streets, but also can think on another way like some big automakers on the marker right now. They have great useful and easy solution for reducing the polltion production by make the motobike can auto shutdown when the users stop when the red light on.

The current state of nowdays is many people stop the red light and they still keep their vehicle running instead of shutting down it for a few minnutes. Maybe you can under underestimate this action, but we have massive vehicles on the streets, so if we make the driver turn off their car, it will have the big affection on the environment prevervation.

The problem is not all of the driver have consciously participating in traffic, they are don’t care about people except theirself . Therefore, we need to make it right by using the electrical equipment for shuting down all the vechiles are stopping at the red light. This device will have the responsibilty for determine of time when the traffic light turns red and it will create a kind of wave which can shutdown every vehicles on its zone.

# The affection ability

This devices will cost the gorverment money for researching and building it. But if we success, we can have the big affection in the world by selling it and give a lot money back.

The road user will also be affected by stopping their car. Maybe they done like it, but it is not only good for them on reducing the ammount of gas they use, but also have the possitive impaction on the enviroment.

In the purpose of preventing the theifs of stealing devices, the gorverment need to increase the camera quantity and the guardians at the device is placing. So it will make the police more busy all the time.

In general, the actors will be affected by this device are:

1. Road users
2. Gorverment
3. Police, guardians, …

# Solution

The device will have tracking sensors when the light is red, so it automatically turns on and off. During a red light, it creates a magnetic field that shuts off the car engine (motorbikes and cars). It will then check the red stop time to turn off the engine, when the light turns green, the magnetic field will turn off and the car will be restarted. That magnetic sensor will be attached to the ground right at the traffic light. There are recorded cameras, images and magnetic sensors will be transmitted to the Traffic Police Department to observe and record each case.

This mode helps drivers to be more aware when stopping the red light, helping to reduce the risk of an accident and reduce exhaust fumes pollution.

Grading Rubric:

* Problem statement: it can be addressed with a IoT, voice, VR, or AR solution -- 4 pts
* Who is affected -- 3 pts
* Solution is described in enough detail to imagine the hardware components that might be needed -- 8 pts