[PROJECT SYNOPSIS](http://210.212.172.190/moodle1920/course/view.php?id=7" \l "section-2)

Title - Traffic Management Using Deep Learning

1. Introduction

Vehicle detection allows the use of various applications of artificial intelligence system for several purposes, especially: intelligent transportation, automatic monitoring, autonomous driving, and driver safety guarantee. In this work, we focus on the detection and recognition of vehicles in a video stream. For this reason, we have used the convolutional neural network technique (CNN) and a dataset that contains images to enable recognition and classification of vehicles.

Convolutional neuron network efficiency depends to a large extent on the quality of the training data set; the network will produce good results only if the training data used contain sufficient important characteristics so that they can produce new predictions.

* 1. Objectives of the project
     1. Detection of vehicles in a live video stream
     2. Determining count of vehicles in a single frame of video
     3. Calculating signal time for all lanes of traffic

1. 2 Scope of the project

* + 1. Creating and training custom object detection model using deep learning
    2. Identifying exact position of a vehicle present in a frame and count number of vehicles
    3. Get signal time and traffic information and process them to generate new signal time allocation scheme

1.3 Problem Definitions

To identify types of vehicles in a frame belonging to categories of car, truck, bikes and buses along with number of vehicles present for the calculation of signal allocation. Creating and training custom object detection model using deep learning and using that model to analyze traffic on road. Determining time allocation scheme for a lane based on traffic.

2. Literature review

2.1 Existing System

1. Conventional image processing: A domain expert will analyze the image; identify a set of filters, transformations and pre processing steps that would be best to uniquely identify each object. Essentially, codify human thought process into a computer vision algorithm.
2. Machine Learning: You would get a training set (hundred thousand images maybe) and convert all the images into feature vectors and train a model. This model could be chosen from an umbrella of algorithms that fall under ‘ML’: SVM (support vector machine) to a 3 layer neural network with a softmax classifier. No clear way to identify which algorithm to use.
3. Deep learning: It is essentially a neural network with multiple layers (usually more than 3) that would require a fairly robust dataset of images to make very accurate predictions. Convolutional Neural Nets (CNN) deep learning models have proven to get very good results. The plus side is that this approach provides a one-for-all architecture to solve such problems. However, it would require more powerful machines than a simple 3 layer neural network.

2.2 Proposed system

Proposed system will have an object detection model which can identify different types of vehicles built in tensorflow. To develop an object detection model we need to give training images and apply preprocessing then pass the dataset to CNN algorithm. The model will be used for identifying different vehicles.

2.3 Methodology

1. Gathering images of different vehicles

2. Images are processed and parameters are collected accordingly.

3. Result set is generated based on processed images for the parameters that can be used to classify different types of vehicles.

4. Input new image or video to be checked.

5. Inserted image or video is then compared with the generated result set and the report is generated.

2.4 Bibliography

1. <http://www.ijcstjournal.org/volume-6/issue-3/IJCST-V6I3P5.pdf>
2. <http://www.ijlemr.com/papers/volume4-issue2/4-IJLEMR-44009.pdf>
3. <http://www.tensorflow.org>