

PROJECT SYNOPSIS

Title - Smart Traffic Control Using DL

1. Introduction

The traffic handling schemes that are in use today are fixed time allocated traffic signal which do not change on incoming traffic or fail to provide time allocation scheme over changing traffic. Where traffic signals are not present this work is carried out by traffic policeman or traffic officer who is able to assess the incoming traffic and provide handling of traffic based on changing traffic. Both of this technique are not suitable where heavy traffic is present or its constantly changing. A solution is required to the traditional traffic signal which can provide better handling of incoming traffic and alert ahead of time of incoming traffic. Thus there is need to make smart traffic control system which can identify types of vehicles in a video frame belonging to categories of car, truck, bikes and buses along with number of vehicles present to control traffic by adjusting traffic signal timing for each individual lane and send this data to its connected signals and alert them of incoming traffic to calculate respective time allocation for each individual lane by using deep learning algorithms and object detection.

1.1 Objectives of the project

- i) Detection of vehicles in a live video stream
- ii) Determining count of vehicles in a single frame of video
- iii) Calculating signal time for all lanes of traffic
- iv) Sending information to connected signal for their use

1. 2 Scope of the project

The project deals with the development of desktop, stand-alone application for the purpose of Smart Traffic Control Using DL. The application is supposed to change the way the manual signal assignment is carried out for different situations. The project can help government to achieve increase in efficiency of signal allocation scheme as defined and used till date by the traffic regulations authorities.

- i) Creating and training custom object detection model using deep learning
- ii) Identifying exact position of a vehicle present in a frame and count number of vehicles
- iii) 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) Traffic Officer - a single officer in charge of all lanes of traffic
- 2) Traffic Signal - a fix time allocation based traffic signal

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2.2 Proposed system

The proposed system is a smart traffic control using deep learning will identify traffic present and give time allocation for each lane according to different situations that will rise. The proposed system is dynamic and adaptable to changing incoming traffic. The proposed system will be able to handle traffic in dynamic manner than the existing static one. The proposed system deals with the development of desktop, stand-alone application for the purpose of Smart Traffic Control Using DL. 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.ijestjournal.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>