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Traffic Prediction for Intelligent Transportation System using Deep Learning

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ABSTRACT

This project entitled as Traffic Prediction for Intelligent Transportation System using Deep Learning is developed by using Front end as a Python backend MySQL Server. Currently the traffic control system in our country is non-flexible to the ever-growing number traffic light is the basic element in traffic flow control through specified waiting and going time, fixed traffic light time systems is a bad control way. Intelligent traffic system includes smart way to control traffic light time based on number of vehicles in each lane. Improving traffic signal control system will increase safety, reliability, and traffic flow speed and reduce average travelling and waiting time for passengers. The objective is to design an efficient automatic Traffic Time Saver system. The system is implemented on the traffic control. In this proposed application system first captures the vehicle image. Vehicle image is extracted using the image segmentation finally converting the images from RGB to grayscale. Next, the segmentation is applied on the prepared image and then for each segment the neural networks will predict a vehicle or not. A counter will count the positive segments. Finally, the suitable periods for each light color will display in GUI.

Keywords: Traffic Prediction for intelligent, deep learning, yolo algorithm, GUI process.

INTRODUCTION

The proposed traffic time saver system is to provide a user-friendly interface for vehicle user they can save time in Traffic signal more effectively. Because traffic signal is a bad control way. Because of traffic signal authority manually set the timer in traffic signal. The problem is will leads time consuming process user need to wait for green colour. Some lane doesn't have any vehicles also sometime green colour signal will show because signal timing will static time control. This leads some problem to driving user they need to wait long time interval of vehicles on the road. The main objective of the proposed system is to provide a user-friendly interface for time save in Traffic signal. Proposed system initially user can able to upload four traffic signal images. After successfully image upload Vehicle image is extracted using the image segmentation finally converting the images from RGB to gray scale. Next, the segmentation is applied on the prepared image and then for each segment the neural networks will predict a vehicle or not. Finally, system automatically count each u uploaded image total vehicle count and control traffic signal automatically.

Overview of Proposed System

The drawbacks, which are faced during existing system, can be eradicated by using the proposed system. The main objective of the proposed system is to provide a user-friendly interface for time save in Traffic signal. The system is implemented on the traffic control. In this proposed application system first captures the vehicle image. Vehicle image is extracted using the image segmentation finally converting the images from RGB to gray scale. Next, the segmentation is applied on the prepared image and then for each segment the neural networks will predict a vehicle or not. A counter will count the positive segments. Finally, the suitable periods for each light color will display in GUI.

Algorithm

YOLO algorithm works using the following two techniques:

Residual blocks

First, the image is divided into various grids. Each grid has a dimension of $S \times S$. The following image shows how an input image is divided into

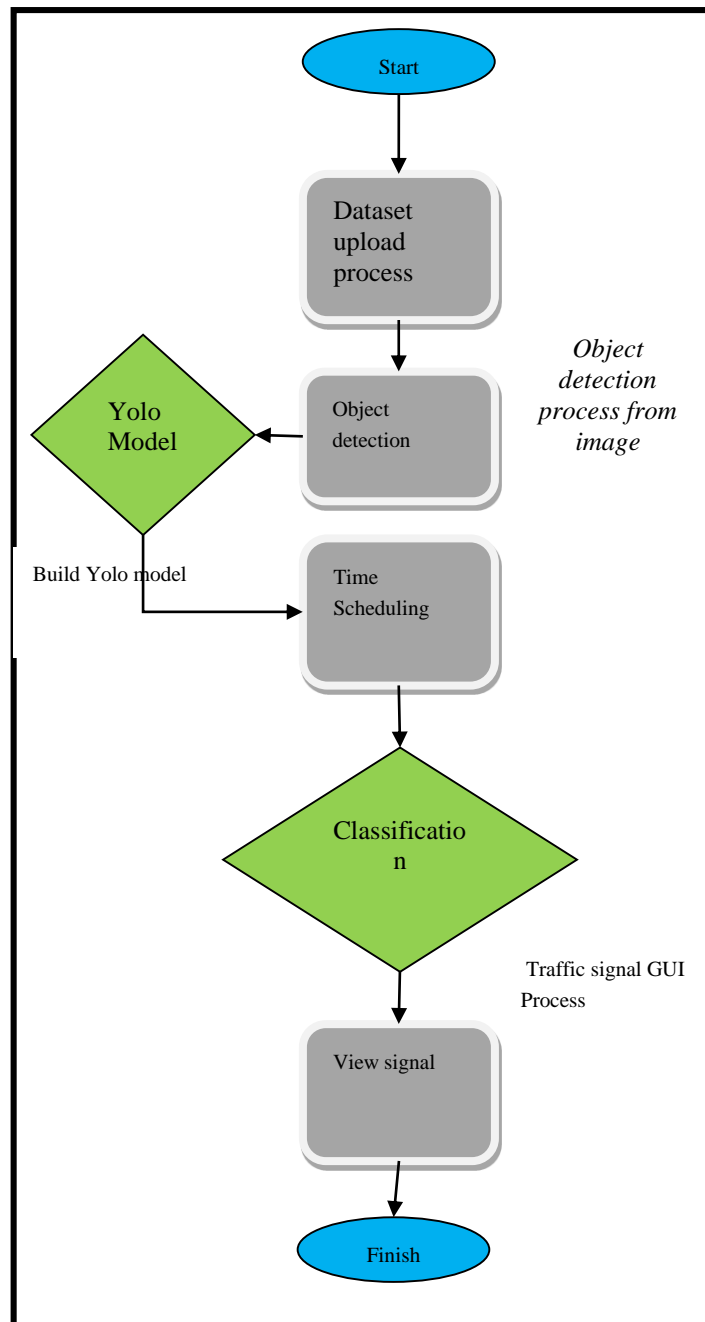
grids.

Bounding box regression

A bounding box is an outline that highlights an object in an image. Every bounding box in the image consists of the following attributes:

- Width (bw)
- Height (bh)
- Class (for example, person, car, traffic light, etc.)- This is represented by the letter c.
- Bounding box center (bx,by)

Methodology



Problem Statements

Traffic Signal control system has become a wide range area of research, due to increase in number of vehicles especially in big cities. Now a day's driving user facing lot of problem in Traffic because traffic control system is a bad control way. Sometime traffic signal authority manually set the timer in traffic signal. But the problem is this will lead time consuming process user need to wait for green color. Some lane doesn't have any vehicles means sometime green color signal will show because signal timing will static once fixed time interval completed they only next lane vehicle can go. This leads some problem to driving user they need to wait long time interval.

Problems are

There is No Automated Time Saver mechanism implement in traffic signal

Not a user friendly application

Driving user need to wait long time interval

This increase travelling and waiting time for passengers.

Conclusion

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective. Proposed system successfully presented YOLO, a new approach to object detection, algorithm that can improve the detection performance based on limited training data and an effective database expansion method. In this proposed application system first captures the vehicle image. Vehicle image is extracted using the image segmentation finally converting the images from RGB to gray scale. Next, the segmentation is applied on the prepared image and then for each segment the neural networks will predict a vehicle or not.

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