



TRAFFIC LIGHT SIGNALING USING DETECTION ALGORITHM

Manchireddy Prasanna Reddy¹, Mr. Shaik shahid², Mr. B Satyanarayana³

¹ PG Student, Department of Computer Science, GITAM (Deemed to be University), Visakhapatnam, India

² Assistant Professor, Department of Computer Science, GITAM (Deemed to be University), Visakhapatnam, India

³ Assistant Professor, Department of Computer Science, GITAM (Deemed to be University), Visakhapatnam, India

Abstract: Traffic signals are essential to guarantee safe driving at road corners. still, they disturb and reduce the business ignorance due to the line detention at each business flux. In this work, we introduce an Intelligent Traffic Light Controlling (ITLC) algorithm. This algorithm considers the real- time business characteristics of each business flux that intends to cross the road crossroad of interest, whilst listing the time phases of each business light. The introduced algorithm aims at adding the business ignorance by abating the waiting time of traveling vehicles at the signalized road corners. also, it aims to increase the number of vehicles crossing the road crossroad per second. In this we used to find the vehicles in north, south, east and west through the deep learning and detection of ambulance using deep learning with the training of deep learning. If the ambulance is detected we should assign the green signal and if the traffic is higher based on the count of vehicles, we should provide green signal for that. For that we used output shell to print output.

Index Terms – CNN, RNN, Image-processing, YOLO,

1.INTRODUCTION

In ultramodern life we've to face with numerous problems one of which is business traffic getting more serious day after day. Business inflow determination can play a principle part in gathering information about them. This data is used to establish censorious inflow time ages similar as the effect of large vehicle, specific part on vehicular business inflow and furnishing a factual record of business volume trends. This recorded information also useful for process the better business in terms of periodic time of business lights. There are numerous routes to count the number of vehicles passed in a particular time, and can give judgment of business inflow. Now a day's camera- grounded systems are better choices for tracing the vehicles data. This design focuses on a firmware- grounded new fashion for vehicle discovery. This approach detects the vehicles in the source image, and applies an being identifier for each of the vehicle. latterly it classifies each vehicle on its vehicle- type group and counts them each by collectively. The developed approach was enforced in a firmware platform which results is better delicacy, high trustability and lower crimes. Business lights play a veritably significant part in business control and regulation on a diurnal base. Using python, the viscosity of the roads is determined and the microcontroller changes the duration of green light given for each road as per the affair after image processing.

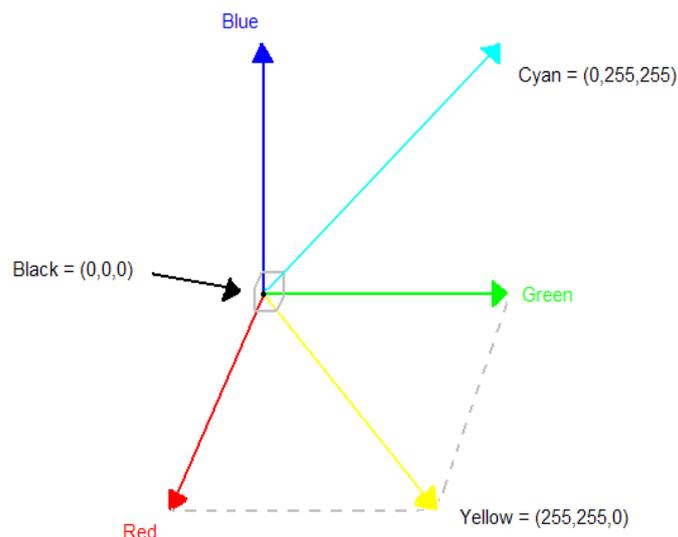


Fig.1 Hue Saturation Process of RGB SCALE Image

IMAGE ACQUISITION:

Image Acquisition is to collect a digital photograph. To collect this requires a picture sensor and the functionality to digitize the sign produced through the sensor. The sensor might be monochrome or coloration TV camera that produces an entire photo of the trouble area each 1/30 sec. The photograph sensor may also be line test virtual digicam that produces a single photo line at a time. In this situation, the gadgets movement beyond the road.

IMAGE ENHANCEMENT:

Image enhancement is most of the best and maximum appealing regions of digital image processing. Basically, the concept in the back of enhancement strategies is to perform detail that is obscured, or clearly to spotlight certain features of exciting an picture. A familiar instance of enhancement is at the same time as we growth the assessment of an photograph due to the fact “it appears higher.” It is essential to remember the fact that enhancement is a completely subjective place of photo processing.

IMAGE RESTORATION

Image recuperation is a place that also deals with enhancing the appearance of an image. However, not like enhancement, that is subjective, photograph recuperation is goal, in the experience that restoration techniques will be predisposed to be based on mathematical or probabilistic fashions of picture degradation

2. SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

The traffic lights used in India are basically pre-timed where in the time of each lane to have a green signal is fixed. In a four-lane traffic signal one lane is given a green signal at a time. Thus, the traffic light allows the vehicles of all lanes to pass in a sequence. So, the traffic can advance in either straight direction or turn by 90 degrees as shown in Fig.1. So even if the traffic density in a particular lane is the least, it has to wait unnecessarily for a long time and when it gets the green signal it unnecessarily makes other lanes wait for even longer durations.

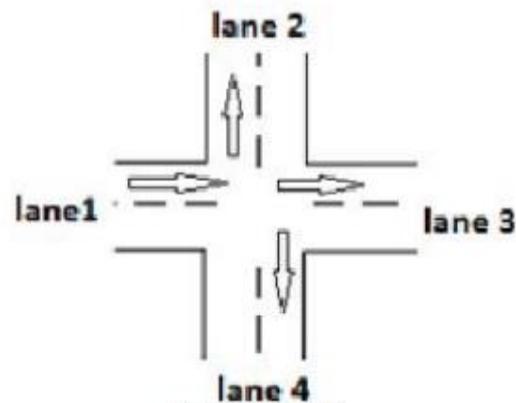


Fig.1 Lane diagram

Disadvantages:

- Time consuming
- Delay
- Less accuracy

2.2 PROPOSED SYSTEM

In this system we are going to implement crowd-based traffic control light system using CNN, lane will be get open on the basis of crowd at the desired lane. It is identified by the capturing the vehicle crowd images in the lane and identifying the number of vehicles with red color in that desired lane.

Advantages:

- High accuracy
- Fast process
- High intelligent technique

3. REQUIREMENT SPECIFICATION**3.1 Hardware Requirements**

- system
- 4 GB of RAM
- 500 GB of Hard disk

3.2 Software Requirements

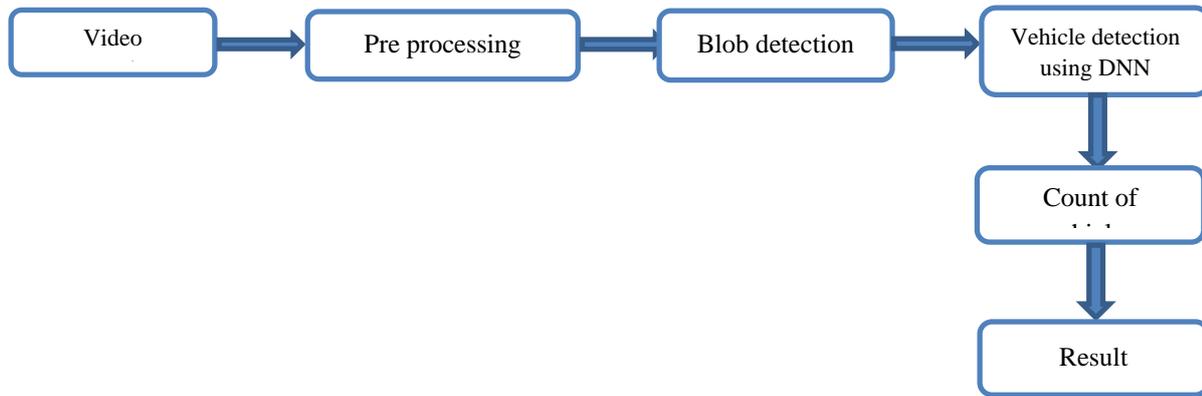
- Python
- Open-CV

3.3 PYTHON

- Python is an interpreted high-level programming language for programming Python offers multiple options for developing GUI (Graphical User Interface). Out of all the GUI methods, tkinter is most commonly used method. It is a standard Python interface to the Tk GUI toolkit shipped with Python. Python with tkinter outputs the fastest and easiest way to create the GUI applications. Creating a GUI using tkinter is an easy task.

4. SYSTEM DESIGN

4.1 Block Diagram



Video streaming:

You can use the desktop software (or mobile app) provided by the IP camera manufacturer, or use a web browser to log on to the camera and then view the IP camera's video stream. If you know the IP camera's RTSP URL, you can also connect it directly from VLC Player, a very popular open-source video player.

PREPROCESSING

Digital image processing deals with manipulation of digital images through a digital computer. It is a subfield of signals and systems but focus particularly on images. DIP focuses on developing a computer system that is able to perform processing on an image. The input of that system is a digital image and the system process that image using efficient algorithm.

It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and distortion during processing.

1. Importing the image via image acquisition tools;
2. Analyzing and manipulating the image;
3. Output in which result can be altered image

Image Pre-processing is a common name for operations with images at the lowest level of abstraction. Its input and output are intensity images. The aim of pre-processing is an improvement of the image data that suppresses unwanted distortions or enhances some image features important for further processing. After getting vehicle detection we have to find vehicles for that load yolo cfg and weights data base files. After that apply input video to the data base with the video for that we should add blob detection.

Blob Detection:

In computer vision, blob detection methods are aimed at detecting regions in a digital image that differ in properties, such as brightness or color, compared to surrounding regions. Informally, a blob is a region of an image in which some properties are constant or approximately constant; all the points in a blob can be considered in some sense to be similar to each other. The most common method for blob detection is convolution.

Given some property of interest expressed as a function of position on the image, there are two main classes of blob detectors: (i) differential methods, which are based on derivatives of the function with respect to position, and (ii) methods based on local extrema, which are based on finding the local maxima and minima of the function. With the more recent terminology used in the field, these detectors can also be referred to as interest point operators, or alternatively interest region operators (see also interest point detection and corner detection).

There are several motivations for studying and developing blob detectors. One main reason is to provide complementary information about regions, which is not obtained from edge detectors or corner detectors. In early work in the area, blob detection was used to obtain regions of interest for further processing. These regions could signal the presence of objects or parts of objects in the image domain with application to object recognition and/or object tracking. In other domains, such as histogram analysis, blob descriptors can also be used for peak detection with application to segmentation. Another common use of blob descriptors is as main primitives for texture analysis and texture recognition. In more recent work, blob descriptors have found increasingly popular use as interest points for wide baseline stereo matching and to signal the presence of informative image features for appearance-based object recognition based on local image statistics. There is also the related notion of ridge detection to signal the presence of elongated objects.

Deep Learning Classification:

Deep learning is a computer software that mimics the network of neurons in a brain. It is a subset of machine learning and is called deep learning because it makes use of deep neural networks.

Deep learning algorithms are constructed with connected layers.

- The first layer is called the Input Layer.
- The last layer is called the Output Layer.

All layers in between are called Hidden Layers. The word deep means the network join neurons in more than two layers.

Each Hidden layer is composed of neurons. The neurons are connected to each other. The neuron will process and then propagate the input signal it receives the layer above it. The strength of the signal given the neuron in the next layer depends on the weight, bias and activation function. The network consumes large amounts of input data and operates them through multiple layers; the network can learn increasingly complex features of the data at each layer.

Classification of Neural Networks
 Shallow neural network: The Shallow neural network has only one hidden layer between the input and output.
 Deep neural network: Deep neural networks have more than one layer. For instance, Google LeNet model for image recognition counts 22 layers.

Nowadays, deep learning is used in many ways like a driverless car, mobile phone, Google Search Engine, Fraud detection, TV, and so on.

Feed-forward neural networks

The simplest type of artificial neural network. With this type of architecture, information flows in only one direction, forward. It means, the information's flows start at the input layer, goes to the "hidden" layers, and end at the output layer. The network does not have a loop. Information stops at the output layers.

Recurrent neural networks (RNNs)

RNN is a multi-layered neural network that can store information in context nodes, allowing it to learn data sequences and output a number or another sequence. In simple words it an Artificial neural networks whose connections between neurons include loops. RNNs are well suited for processing sequences of inputs. Example, if the task is to predict the next word in the sentence "Do you want a.....?The RNN neurons will receive a signal that point to the start of the sentence. The network receives the word "Do" as an input and produces a vector of the number. This vector is fed back to the neuron to provide a memory to the network. This stage helps the network to remember it received "Do" and it received it in the first position.

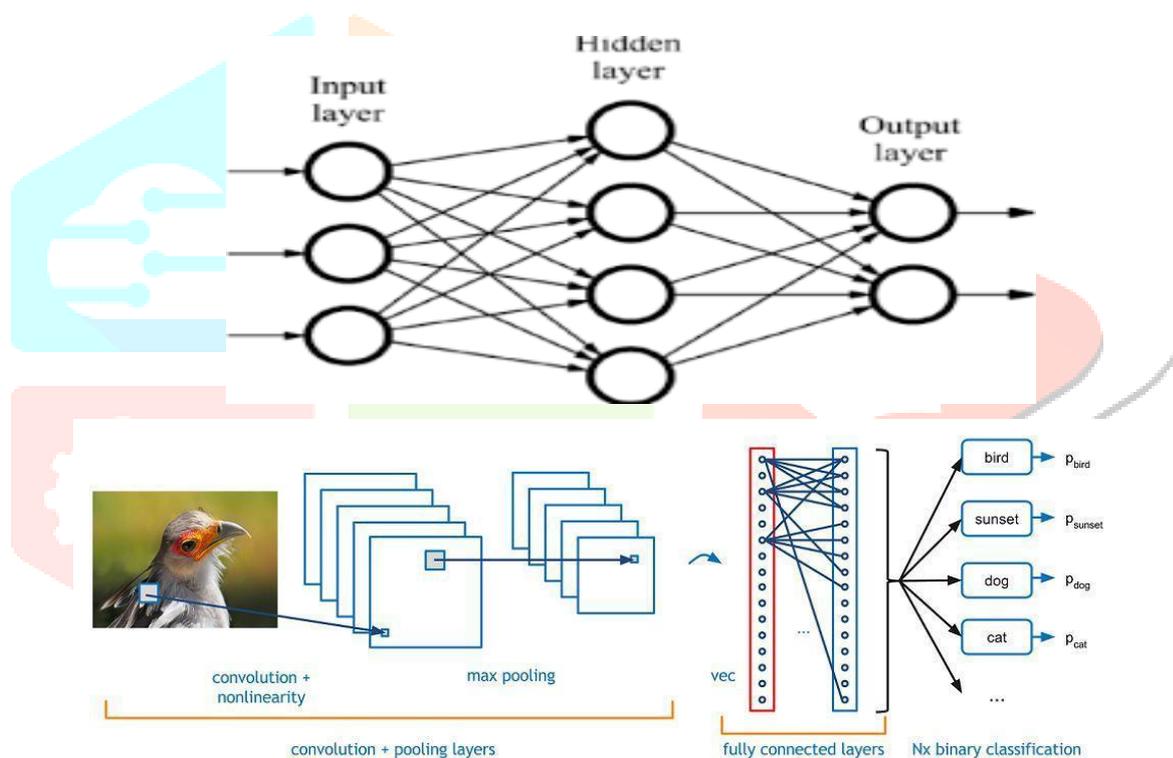
The network will similarly proceed to the next words. It takes the word "you" and "want." The state of the neurons is updated upon receiving each word.

The final stage occurs after receiving the word "a." The neural network will provide a probability for each English word that can be used to complete the sentence. A well-trained RNN probably assigns a high probability to "café," "drink," "burger," etc.

Convolutional Neural Network (CNN)

Deep learning CNN is composed of convolutional layers for feature extraction from input data. Typically, the network is comprised of an input layer, hidden layer(s) and an output layer. The structure of neurons which mimic the human neural network are three-dimensional to have width, height, and depths for the inputs and outputs. Depending on the arrangement, the hidden layers could be convolution, pooling and normalization layers.

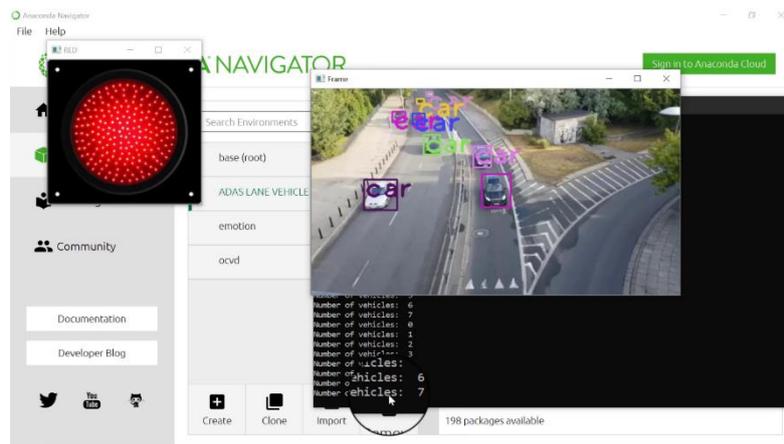
The CNN layers perform feature extraction of input data through a convolutional process using filters (kernels). The layers read the distinctive values from input data to generate feature activation maps which highlights relevant features of the data. The feature activation maps are units with parameters which, when activated result to the convolution of the kernel over the data.



Yolo:

You Only Look Once (YOLO): Implementing YOLO in less than 30 lines of Python Code. You Only Look Once is a real-time object detection algorithm, that avoids spending too much time on generating region proposals. Instead of locating objects perfectly, it prioritizes speed and recognition. After completion of training, we can get vehicle detection and vehicle detection based on the traffic density it will assign the traffic lights and count detection step.

5.Result and Analysis



6.CONCLUSION

In this ultramodern period as the population is increased fleetly the operation of vehicles has also increased extensively. The explanation for it's heavy business. so as to avoid this problem, it's better that we flow new communication styles similar as image processing grounded intelligent business controlling and covering system using OPENCV. By using this system we will get the details about information about vehicles in particular junctions through internet access. this is frequently more salutary for the exigency travelling.

REFERENCES

- [1] H. R. Babaei, O. Molalapata and A. A. Pandor, Face Recognition Application for Automatic Teller Machines (ATM), in ICIKM, 3rd ed. vol.45, pp.211-216, 2012.
- [2] Aru, O. Eze and I. Gozie, Facial Verification Technology for Use in ATM Transactions, in American Journal of Engineering Research (AJER), [Online] 2013, pp. 188-193, Available:[http://www.ajer.org/papers/v2\(5\)/Y02501880193.pdf](http://www.ajer.org/papers/v2(5)/Y02501880193.pdf) – K.
- [3] J. Peter, G. Nagarajan, G. G. S. Glory, V. V. S. Devi, S. Arguman and K. S. Kannan, Improving ATM Security via Face Recognition, in ICECT, Kanyakumari, 2011, vol.6, pp.373-376.
- [4] E. Derman, Y. K. Gecici and A. A. Salah, Short Term Face Recognition for Automatic Teller Machine (ATM) Users, in ICECCO 2013, Istanbul, Turkey, pp.111-114
- [5] A. Ross and A. Jain, Information Fusion in Biometrics, in Pattern Recognition Letters, vol.24, pp.2115-2125, 2003.

- [6] Ing. Ibrahim Nahhas, Ing. Filip Orsag, Ph.D “Real Time Human Detection And Tracking”, Bruno University of Technology.
- [7] Vikramaditya Dangi, Amol Parab, "Image Processing Based Intelligent Traffic Controller", Undergraduate Academic Research Journal (UARJ), ISSN : 2278 – 1129, Volume-1, Issue-1, 2012.
- [8] Raoul de Charette and Fawzi Nashashibi, “Traffic light recognition using Image processing Compared to Learning Processes”.
- [9] Mriganka Panjwani, Nikhil Tyagi, Ms. D. Shalini, Prof. K Venkata Lakshmi Narayana, “Smart Traffic Control Using Image Processing”.
- [10] Shiu Kumar"UBIQUITOUS SMART HOME SYSTEM USING ANDROID APPLICATION" International Journal of Computer Networks & Communications (IJCNC) Vol.6, No.1, January 2014

