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DENSITY BASED SMART TRAFFIC SYSTEM USING CANNY EDGE DETECTION

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ABSTRACT:- Traffic Management is one of important issues in the modern cities. There has been a manifold increase in the number of vehicles in all major cities leading to traffic congestion and less space on the road.At traffic light junctions traffic management systems are placed to automatically manage the control of red, green and yellow lights for smooth conduction for traffic. But in most systems, the scheduling of the lights is done on fixed basis without taking into account the actual traffic scenarios in each lane. In this research work, a method of detecting the density of traffic in each lane is proposed using image processing and canny edge detection technique.Recent study of World Bank has shown that average vehicle speed has been reduced from 21 km to 7 km per hour in the last 10 years

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1.INTRODUCTION

Traffic congestion is one of the major modern-day crisis in every big city in the world. Recent study of World Bank has shown that average vehicle speed has been reduced from 21 km to 7 km per hour in the last 10 years in Dhaka [1]. Intermetropolitan area studies suggest that traffic congestion reduces regional competitiveness and redistributes economic activity by slowing growth in county gross output or slowing metropolitan area employment growth [2].As more and more vehicles are commissioning in an already congested traffic system, there is an urgent need for a whole new traffic control system using advanced technologies to utilize the already existent infrastructures to its full extent. Since building new roads, flyovers, elevated expressway etc. needs extensive planning, huge capital and lots of time; focus should be directed upon availing existing infrastructures more efficiently and diligently. glean traffic data. Some of them count total number of pixels [3], some of the work calculate number of vehicles [4-6].These methods have shown promising results in collecting traffic data. However, calculating the number of vehicles may give false results if the intravehicular spacing is very small (two vehicles close to each other may be counted as one) and it may not count rickshaw or auto-rickshaw as vehicles which are the quotidian means of traffic especially in South-Asian countries. And counting number of pixels has disadvantage of counting insubstantial materials as vehicles such as footpath or pedestrians. Some of the work have proposed to allocate time based solely on the density of traffic. But this may be disadvantageous for those who are in lanes that have less frequency of traffic.

II. LITERATURE SURVEY

M. Sweet, “Traffic Congestion’s Economic Impacts: Evidence from US Metropolitan Regions,” Urban Studies, vol. 51, no. 10, pp. 2088–2110, Oct. 2013

Traffic congestion alleviation has long been a common core transport policy objective, but it remains unclear under which conditions this universal byproduct of urban life also impedes the economy. Using panel data for 88 US metropolitan statistical areas, this study estimates congestion’s drag on employment growth (1993 to 2008) and productivity growth per worker (2001 to 2007). Using instrumental variables, results suggest that congestion slows job growth above thresholds of approximately 4.5 minutes of delay per one-way auto commute and 11,000 average daily traffic (ADT) per lane on average across the regional freeway

network. While higher ADT per freeway lane appears to slow productivity growth, there is no evidence of congestion-induced travel delay impeding productivity growth. Results suggest that the strict policy focus on travel time savings may be misplaced and, instead, better outlooks for managing congestion's economic drag lie in prioritising the economically most important trips (perhaps through road pricing) or in providing alternative travel capacity to enable access despite congestion

Md. Munir Hasan, Gobinda Saha, Aminul Hoque and Md. Badruddoja Majumder, "Smart Traffic Control System with Application of Image Processing Techniques," in 3rd International Conference on Informatic Electronics & Vision, Dhaka, May 2017.

In this paper we propose a method for determining traffic congestion on roads using image processing techniques and a model for controlling traffic signals based on information received from images of roads taken by video camera. We extract traffic density which corresponds to total area occupied by vehicles on the road in terms of total amount of pixels in a video frame instead of calculating number of vehicles. We set two parameters as output,

variable traffic cycle and weighted time for each road based on traffic density and control traffic lights in a sequential manner.

Vismay Pandit, Jinesh Doshi, Dhruv Mehta, Ashay Mhatre and Abhilash Janardhan, "Smart Traffic Control System Using Image Processing," International Journal of Emerging Trends & Technology in Computer Science (IJETTCS), Vol. 3, Issue 1, January – February 2018

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Pallavi Choudekar, Sayanti Banerjee and M. K. Muju, "Implementation of image processing in real time traffic light control," in3rd International Conference on Electronics Computer Technology, April, 2011.

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Control traffic lights in a sequential manner.

EXISTING SYSTEM:

In present traffic control system it require man power to control the traffic. Depending on the countries and states the traffic polices are allotted for a required area or city to control traffic. The traffic polices will carry sign board, sign light and whistle to control the traffic. They will be instructed to wear specific uniforms in order to control the traffic Previously different techniques had been proposed, such as infra-red light sensor, induction loop etc. to acquire traffic date which had their fair share of demerits. In recent years, image processing has shown promising outcomes in acquiring real time traffic information using CCTV footage installed along the traffic light.

Drawbacks:-

In the manual controlling system we need more man power. As we have poor strength of traffic police we cannot control traffic manually in all area of a city or town. So we need a better solution to control the traffic. On the other side, automatic traffic controlling a traffic light uses timer for every phase. Using electronic sensors is another way in order to detect vehicles, and produce signal that to this method the time is being wasted by a green light on an empty road. Traffic congestion also occurred while using the electronic sensors for controlling the traffic. All these drawbacks are supposed to be eliminated by using image processing.

PROPOSED SYSTEM:

To implement this technique we are uploading current traffic image to the application and application will extract edges from images and if there is more traffic then there will be more number of edges with white colour and if uploaded image contains less traffic then it will have less number of white colour edges.

In this paper, a system in which density of traffic is measured by comparing captured image with real time traffic information against the image of the empty road as reference image is proposed.Each lane will have a minimum amount of green signal duration allocated. According to the percentage of matching allocated traffic light duration can be controlled. The matching is achieved by comparing the number of white points between two images.

The entire image processing before edge detection i.e. image acquisition, image resizing, RGB to gray conversion and noise reduction. After that, canny edge detection operation and white point count are depicted. Canny edge detector operator is selected because Of its greater overall performance.

Advantages :-

It is advantageous to convert RGB images into grayscale for further processing. When converting an RGB image to grayscale, it is pertinent to consider the RGB values for each pixel and make as output a single value

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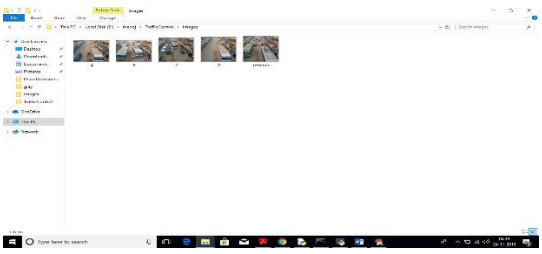
reflecting the brightness of that pixel. One of the approaches is to take the average of the contribution from each channel:(R+B+C)/3

MODULES:

System Construction Module :

• User Login Screen

To implement this project we are using 4 input images given in paper and on reference image. Below are the images screen shots saved inside images folder

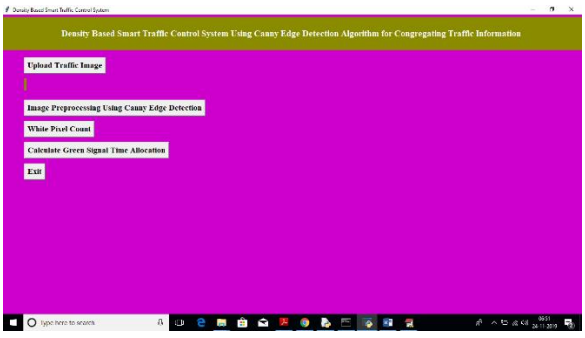


We can upload above 4 images to application to calculate traffic signal time.

Screen shots

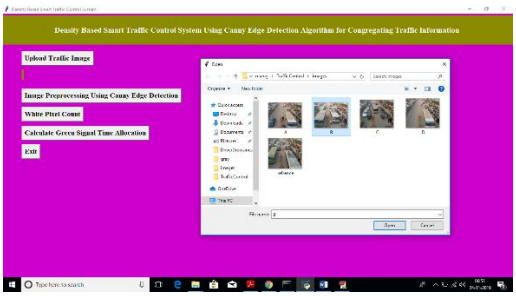
To run this project double click on 'run.bat' file to get below screen

User Interface

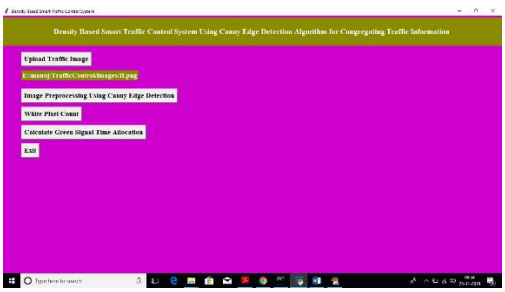


n above screen click on 'Upload Traffic Image' button to upload image.

Upload Image Module

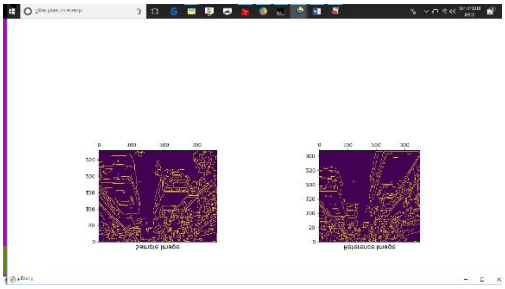


In above screen I am uploading image B and now click on 'Open' button to load image



In above screen we got message as input image loaded. Now click on 'Image Pre-processing Using Canny Edge Detection' button to apply Gaussian filter and to get canny edges, after clicking button wait for few seconds till you get below screen with edges.

Preprocess module



In above screen left side image is the uploaded image and right side is the 'Reference Image', Now close this above screen and click on 'White Pixel count' button to get white pixels from both images.

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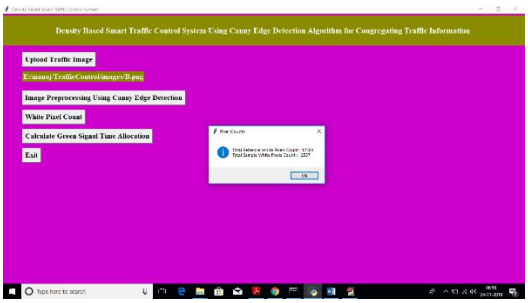
White Pixel Count Module



In above screen dialog box we can see total white pixels found in both sample and reference image. Now click on 'Calculate Green Signal Time Allocation' button to get signal time

4. RESULTS:

The current android application is developed using Xml, Java, SQL with Firebase connectivity. It can be used by every individual who are in a need of fulfilling their household services.

At the time of submission of my application was capable of doing the following:

Displaying thehome screen with different fragments.

Authentication of user by using login screen using Firebase.

Home screen to display based on user or service provider.

After successful login of user, they can choose the service and book a slot of their particular service provider from the displayed list.

Add, update, view, delete the user details.

After successful login of service provider, they can view all the bookings that are booked by the users and can attend them one by one.

Service provider can also set his preferences to not available, if he's too busy or many users had already booked him.

Service provider has the ability to change their particular radius of location for servicing.

He can set up to 10 km radius.

Logout and end the session.

5. CONCLUSION

In this paper, a smart traffic control system availing image processing as an instrument for measuring the density has been proposed. Besides explaining the limitations of current near obsolete traffic control system, the advantages of proposed traffic control system have been demonstrated. For this purpose, four sample images of different traffic scenario have been attained. Upon completion of edge detection, the similarity between sample images with the reference image has been calculated. Using this similarity, time allocation has been carried out for each individual image in accordance with the time allocation algorithm. In addition, similarity in percentage and time

allocation have been illustrated for each of the four sample images using Python programming language. Besides presenting the schematics for the proposed smart traffic control system, all the necessary results have been verified by hardware implementation

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