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Monitoring Traffic in Metropolitan cities using Camera

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ABSTRACT

The rise in traffic congestion and due to these traffic & not following traffic rules accidents in the recent times is a major problem that many cities in India are facing. The basic aim of our project is to monitor the traffic conditions in a metropolitan city. We aim to use traffic cameras for capturing images of transport and then with the use of image processing, extract the essential details about the vehicle and store that in a database for the purpose of future need. The project deals with the use of these technologies to increase road safety and assist traffic movements to avoid congestion. The objective of the project is to strive and avoid traffic accidents which are a rising threat in metropolitan cities these days. It also aims at decreasing crimes on the transport sector and provides help for references.

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I. INTRODUCTION

Monitoring traffic is the prevent conjunction of traffic & reduce high traffic using the live video feed from the camera which is place on each of traffic signal. From the captured videos the images and frames are created from Key frame detection algorithm. Through the frames the number of vehicles are count using the Hash algorithm. The basic concept behind hash algorithm is that,providing a virtual line. Virtual line is a path through with we can count vehicle or keep record of vehicle that passes through the virtual line. This, line is created by using the threshold value. Hence, from the count we can monitor the vehicles and provide the necessary information on that particular traffic signal or red light violation. As we got the count of the vehicle we can predict the traffic congestion, traffic density and plotting the graph through the mean of count. The graph are plot in bar graph, line graph through R-language and can be shown on mobile app. Through mobile app we can provide information related to the traffic and avoid the traffic congestion.

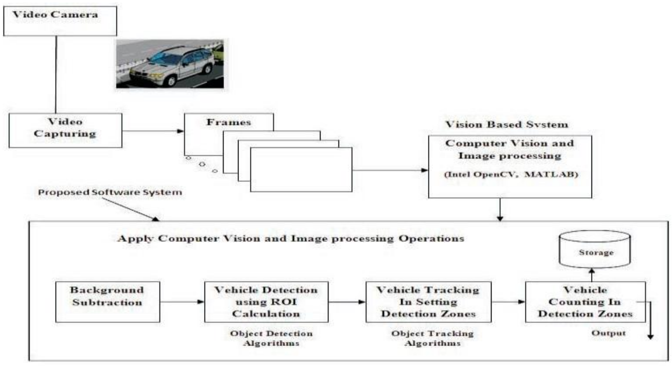
II. HISTORY AND DEVELOPMENT

The cameras will capture still and video images of vehicles in the act of a traffic signal contravention, which will initiate the procedure to deliver a notice of legal to the registered owner of the vehicle. The contravention is a civil matter and will not be reported to insurance companies or generate points on a driver's license. Evidence captured by the Red Light Cameras is reviewed three times and approved by the Rochester Police Department before a Notice of Liability is delivered in the mail to the registered owner of the vehicle. The cameras operate 24 hours a day and capture still photographs and video of every vehicle that runs a red light at the intersection. Cameras photograph only the vehicle and license plate of vehicles running the red lights. No images of the driver or passengers are captured. The occurred event of an attack, but also to prevent the attack has become an absolute necessity. Especially with the begin of Probing, User to Root Attacks, Remote to User Attacks, Denial of Service and Distributed Denial of Service attacks, the market needs have grown stronger and stronger for Intrusion Prevention Systems (IPS) rather than mere intrusion detection. The cameras will capture still and video images of vehicles in the act of a traffic signal contravention, which will initiate the procedure to deliver a Notice of Liability to the registered owner of the vehicle. The contravention is a civil matter and will not be reported to insurance companies or generate points on a driver's license. Evidence captured by the Red Light Cameras is reviewed three times and approved by the Rochester Police Department before a Notice of Liability is delivered in the mail to the registered owner of the vehicle. The cameras operate 24 hours a day and capture still photographs and video of every vehicle that runs a red light at the intersection. Cameras photograph only the vehicle and license plate of vehicles running the red lights

III. CAMERA BASED VEHICAL DETECTION TECHNIQUE

At its highest level Video Analytic provides the capability of automatically analysing video to detect and determine events. This allows a wealth of data to be collected from what is often a very cheap and well understood .sensor. This analysis is carried out in many and varied ways but in essence the following process can be considered generic to most systems This shows that the system first removes the background parts of the image (background subtraction); leaving only the foreground, containing the objects we wish to analyse. This foreground is then split into different objects. These objects can then be given attributes such as size, position, shape colour and texture. These attributes can then be used to track the objects through the scene providing some contextual data. In order to make sense of this wealth of data and turn it into information logical rules can be created to trigger events based on certain scenarios such as Send an alert when a person (shape) enters the works area (position) and stays there for 2 minutes (time) 3 of 12 As it can be seen this approach is very flexible and can account for a vast multitude of scenarios in which Video Analytic can be used (and indeed this has led to a widespread adoption of VA in many sectors). However, as the rules used to trigger events are often very basic to achieve reliable results the resulting logical rules can often become complex, to remove unwanted false alarms. Herein lies the stumbling block for VA, it often requires well trained operatives to set up the rules.

IV. ARCHITECTURE



V. TEMPLATE MATCHING

Template matching is a technique in digital image processing for finding small parts of an image which match a template image. It can be used in manufacturing as a part of quality control, a way to navigate a mobile robot, or as a way to detect edges in image

1)Template-based approach: For templates without strong features, or for when the bulk of the template image constitutes the matching image, a template-based approach may be effective. As aforementioned, since template-based template matching may potentially require sampling of a large number of points, it is possible to reduce the number of sampling points by reducing the resolution of the search and template images by the same factor and performing the operation on the resultant downsized images (multi resolution, or Pyramid (image processing)), providing a search window of data points within the search image so that the template does not have to search every viable data point, or a combination of both.

2)Template-based matching and convolution: A basic method of template matching uses a convolution mask (template), tailored to a specific feature of the search image, which we want to detect. This technique can be easily performed on grey images or edge images. The convolution output will be highest at places where the image structure matches the mask structure, where large image values get multiplied by large mask values. This method is normally implemented by first picking out a part of the search image to use as a template: We will call the search image S(x, y), where (x, y) represent the coordinates of each pixel in the search image. We will call the template T(x t, y t), where (xt, yt) represent the coordinates of each pixel in the template. We then simply move the center(or the origin) of the template T(x t, y t) over each (x, y) point in the search image and calculate the sum of products between the coefficients in S(x, y) and T(xt, yt) over the whole area spanned by the template. As all possible positions of the template with respect to the search image are considered, the position with the highest score is the best position. This method is sometimes referred to as 'Linear and the template is called a filter mask.

VI. BLOB DETECTION

One of the schemes for blobbing images is to scan the image in raster order, labeling pixels according to their already labelled neighbours. If there are no labelled neighbours, then a new label is used. The labels are usually integers stored in a new 'image' or array, which I will call the 'blob image', and are used go associated the corresponding pixels in the original image. If the blobs are skinny and curved, then various ends or humps will appear as separate objects during this labeling scan, and will be joined together later on when enough rows have been scanned to 'connect all of the pieces'. When this occurs, then the two or more different labels must be associated together as one object. This is done by maintaining a 'blob equivalence table' during the labeling scan, then simplifying the table so that all labels in any one blob are known to be equivalent to one label that is eventually used for the whole blob. This relabeling is done in a second scan of the image (actually, scanning the blob image).

VII. EDGE DETECTION

Edge detection is the name for a set of graphical methods which aim at identifying points in a digital image at which the image brightness changes sharply or it has discontinuities. The points at which image brightness changes sharply which is typically organized into a set of curved line segments termed edges. The same problem of finding discontinuities in 1D signals is called as step detection and the problem of finding signal discontinuities over time is known as change detection. Edge detection is a fundamental tool in image processing, machine vision and computer vision, particularly in the areas of feature detection and feature extraction

VIII. CONCLUSION

In this thesis we first described the most common types of camera communication designs. Next, we analysed data aggregation methods for camera in highly dense environments and evaluated well-known architecture and power consumption models for camera. We showed that the power consumption of a camera is proportional to the data transmission and reception rate. Furthermore, we analysed three data aggregation and minimization methods used in camera and presented the ad- vantages of a cluster-based architecture design compared over one-hop and multi-hop designs in performing data fusion. In this thesis we first described the most common types of camera communication designs. Next, we analysed data aggregation methods for camera in highly dense environments and evaluated well-known architecture and power consumption models for camera. We showed that the power consumption of a camera is proportional to the data transmission and reception rate. Furthermore, we analysed three data aggregation and minimization methods used in camera and presented the ad- vantages of a cluster-based architecture design compared over one-hop and multi-hop designs in performing data fusion.

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