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TRAFFIC RETIMING SYSTEM USING IMAGE PROCESSING

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ABSTRACT

One of the main problems in cities is traffic, this paper proposed new solution to traffic control. The main design concept of this project is to control the traffic automatically. System is made more efficient with addition of intelligence in term of artificial vision, using image processing techniques to estimate actual road traffic and compute time, each time for every road before enabling the signal. This model is resemblance of traditional traffic police man who takes better decision every time and soothes traffic flow. Unpredicted growth of traffic today has created serious problem in metro cities.

This project has been implemented in the Matlab software and it aims to prevent heavy traffic in highways. Moreover, for implementing this project following steps must be considered: 1) image acquisition 2) RGB to gray scale transformation 3) image cropping and 4) density estimation. At first, film of highway is captured by a camera which is installed at the square that is intersection of road.

Then, the camera takes pictures at regular intervals and then the captured frame is sent to the computer for further processing. After that, the number of cars in square is specified. At the end, if the number of cars is more than a threshold, a message is shown to inform the traffic status. By this message we can predict the need to reduce the size of traffic carried. Experiments show that the algorithm will work properly and also we can re-time the traffic green light and maintain the proper traffic management.

Most of the city traffic is controlled by sensors and cameras shall be installed in big highways and streets. But existence of a system for detecting the size of traffic automatically will be felt. Such systems can allow extracting information from the bigger traffic issue and helps us decide to improve the traffic policy. The project aims to render automate control system for traffic on highways and street.

KEYWORDS: Image processing.

INTRODUCTION

As we know the population of city and number of cars is increasing day by day. With increasing urban population and hence the number of cars, need of controlling streets, highways and roads is vital. In this paper, a system that estimates the size of traffic in highways by using image processing has been proposed and as a result a message is shown to inform the number of cars in highway. This project has been implemented by using the Matlab software and it aims to prevent heavy traffic in highways. Moreover, for implementing this project following steps must be considered: 1) image acquisition 2) RGB to gray scale transformation 3) image enhancement and 4) morphological operations. At first, film of highway is captured by a camera has been installed in square.

Then, the film comes in the form of consecutive frames and each frame is compared with the first frame. After that, the number of cars in square is specified. At the end, if the number of cars is more than a threshold, a message is shown to inform the traffic status. By this message we can predict the need to reduce the size of traffic carried. Experiments show that the algorithm will work properly and also we can re-time the traffic green light and maintain the proper traffic management.

Most of the city traffic is controlled by sensors and cameras shall be installed in big highways and streets. But existence of a system for detecting the size of traffic automatically will be felt. Such systems can allow extracting information

from the bigger traffic issue and helps us decide to improve the traffic policy. The paper aims to render automate control system for traffic on highways and street. The system using image processing has been implemented where upon it entailed the following results: 1) Density 2) Streets and roads in order to census counted three cars 3) monitor off roads 4) Detect the occurrence of accidents and violations occurred as well as motion detection car is a dangerous spiral. Scientists and other researchers suggested other different ways. Technically, this system is based on computers and cameras. The project components includes: (A) hardware model (B) software model.

Software model

For our algorithm; software Matlab has been used. Some steps for implementing this algorithm are as follows: Receiving video via camera and convert video input to two images RGB to gray-scale conversion on received images image enhancement

Hardware model

Image sensors: In this project the images are captured by a USB web camera have been used. PC: a pc as a general purpose central unit for various image processing tasks has been used to

Proposed system theory talks about the different types of vehicle tracking and operations. In Section morphological operation has been presented. Rest of the paper shows the suggested algorithm and flowchart in summary and Section deals with the results of experiments. Last section talks about conclusion.

PROBLEM STATEMENT

Through this paper we intend to present an improvement in existing traffic control system at intersection. System is made more efficient with addition of intelligence in term of artificial vision, using image processing techniques to estimate actual road traffic and compute time each time for every road before enabling the signal. This model is resemblance of traditional traffic police man who takes better decision every time and soothes traffic flow. Unpredicted growth of traffic today has created serious problem in metro cities. Existing automatic traffic control system at intersection with preset timing signals is proved to be inefficient for the reason that system is not intelligent enough to make judgment of varying road traffic density and fail to allocate specific time to clear it. Unnecessary waiting till preset time lapse or wait for multiple round of turns to clear the traffic

METHODOLOGY/ PROPOSED WORK

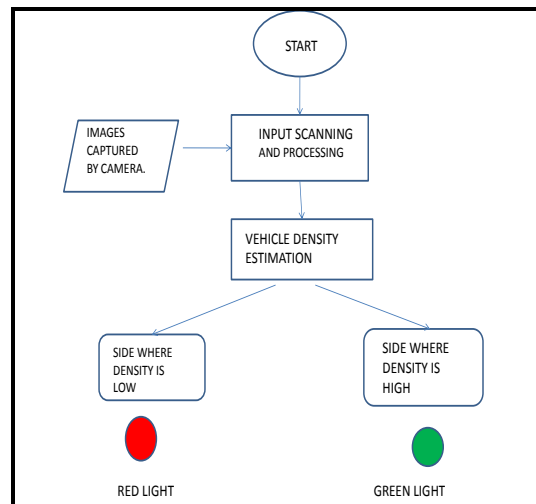


Figure 1. General flow of proposed system

Our proposed method consists of two phases.

Phase 1:

First images are captured by camera. The first images of highway when there is no traffic will be taken. The first image of highway has been considered as a reference file and stored in a specific location in the program. RGB to Grayscale Conversion in order to achieve image enhancement is done.

Phase 2:

At first, images are captured from the highway. RGB to Grayscale conversion has done on the hierarchy of images. Then, gamma correction has been applied on each Gray images. At the end, vehicle tracking is done. Generally, vehicle tracking included two parts: 1) Background elimination; 2) lane masking..

PROCESS AUTOMATION

The system starts with an image acquisition process in which the live picture is processed by the stationary camera, mounted on any pole. Then one frame per second continuously extracts from the live picture and processed each frame by converting it into grayscale. The second step is the image cropping in which, the targeted area is selected, the area where the vehicles are present and filtered out unnecessary surrounding information. Then the presence of objects is enhanced by binarization of the difference image. Then the final step is to calculate the traffic density in the desired target area by counting the number of vehicles in that region. To perform this, first, the vehicles are marked in the targeted region by scanning all the connected objects, and filtering out smaller and overlapping objects. In order to deal with noise added due to different lighting conditions at different times of the day, a set of reference images have been captured and stored at different time Each vehicle is detected regardless of its colour, shape and location within the work space of the vision camera. Areas with different pixel values are highlighted by a rectangular frame. The Outputs are as follows:-



Figure 2. Original Image

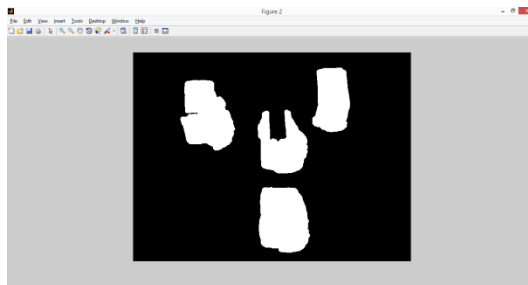


Figure 3. Cropped Objects

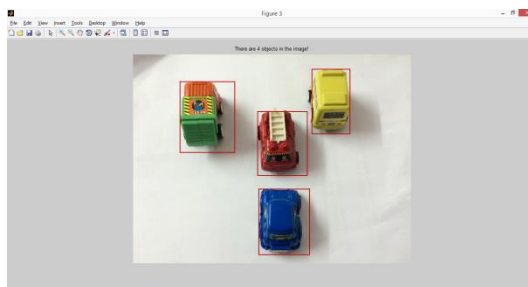


Figure 4. The count of cropped Objects.

The captured image is brought into the MATLAB workspace for further processing. The image as shown is then converted into the binary image. Image cropping is done to get the required region. The connecting objects are counted and this is the density of the vehicles. This count is then reflected on the LCD .

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