Innovation To Save Lives And Assets Using Image Processing

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Abstract: The primary purpose of fire engine include transporting fire fighters to an incident scene, providing water with which to fight a fire, and carrying other equipment needed by fire fighter. Traffic congestion is a major problem in cities of developing Countries like India. Growth in urban population and the middle-class segment consume vehicles to the rising number of vehicles in the cities. Congestion on roads eventually results in slow moving traffic, which increases the time of travel, thus be notable as one of the major issues in metropolitan cities. Emergency vehicles like Fire truck and s need to reach their destination at the earliest. If they spend a lot of time in traffic jams, valued lives of many people may be danger. Here the image sequences from a camera are analysed using various edge detection and object counting methods to obtain the most efficient technique. Then, the number of vehicles at the intersection is evaluated and traffic is efficiently managed. The traffic signal indication continuously glows to green as long as the emergency vehicle is waiting at the traffic lane. After the vehicle crossed the junction, automatically the traffic signals follow the previous pattern generation of traffic signals. This can be implemented in LABVIEW.

I.   INTRODUCTION

Automatic traffic monitoring and surveillance are important for road usage and management. Traffic parameter estimation has been an active research area for the development of intelligent Transportation systems (ITS).For ITS applications traffic-information needs to be collected and distributed. Various sensors have been employed to estimate traffic parameters for updating traffic information. Magnetic loop detectors have been the most used technologies but their installation and maintenance are inconvenient and might became incompatible with future ITS infrastructure.

It is well recognized that vision-based camera system are more versatile for traffic parameter estimation .In addition to quantitative description of road congestion, image measurement can provide quantitative description of traffic status including speeds, vehicle counts, etc. Moreover, quantitative traffic parameter can give us complete traffic flow information, which fulfills the requirement of traffic management theory. Image tracking of moving vehicles can give us quantitative description of traffic flow. In the present work the designed system aims to achieve the following.

✓ Distinguish the presence and absence of vehicle in road images;
✓ Signal the traffic light to go red if the road is empty;
✓ Signal the traffic light to go green in case of presence of traffic on the road and the duration of green light is adjusted according to the traffic density.

Figure 1: City traffic halts Fire trucks

As a problem of urban traffic congestion spreads, there is a pressing need for the introduction of advanced technology and equipment to improve the state of the art of traffic control. Traffic problems now days are increasing because of the growing number of vehicles and the limited resources provided by current infrastructures. The simplest way of controlling a traffic light uses timer for each phase. Another way is to use electronic sensor in order to detect vehicles, and produce signal that cycles. We propose a system for controlling the traffic light by image processing.

Figure 2: Cleared path for Fire truck

The system will detect vehicle through images instead of using electronic sensors embedded in the pavement. A camera will be installed within certain distances from the traffic light it will capture the image sequences. setting image of an empty road as reference image, the captured images are sequentially matched using image matching. Whenever an Fire truck enters into the range of sensors then it captures the image and compare with the reference image. if it matches with reference image then the signal will be controlled and cleared, so as to give a clear way to pass the Fire truck. It helps to save the lives of human being by providing clear way to traffic.

OBJECTIVES

To provide clear way to the Fire truck whenever it enters into the range of camera and to control the signals by measuring the density of traffic there by avoiding wastage of time and saving the lives of human being.

II. METHODOLOGY

SYSTEM DESIGN

Design is the key phase of any project. It is the first step in moving from the problem domain. The input to the design phase is the specifications of the system to design. Before the implementation of package, this has to be carried out thoroughly to illuminate any bug, which may be present. The project has to be submitted for system design. The output of the top level designs such as architectural design, or the system design for software system to be built. A design should be very clear, verifiable, complete, efficient, and simple.

Here the focus is on deciding which modules are needed for the system, the specifications of these modules low and how the module should be interconnected. It includes the following types of design.

- ✓ *DATABASE DESIGN:* It describes structure that resides within the system.
- ✓ *ARCHITECTURE DESIGN:* It uses information flow characteristics and maps them into the program structure. Transformations mapping method is applied to exhibit distinct boundaries between incoming.

In the current scenario, all the information and activities relies either on paperwork or on in broke, distributed and automation such as use of Microsoft word. The problem that arises in such a scenario is that the process is too cumber some and demanding as well

The Architecture Diagram depicts the overall structure of the software application or model that is to be created or already created architectural diagram. It uses information flow characteristics and maps them into the program structure.
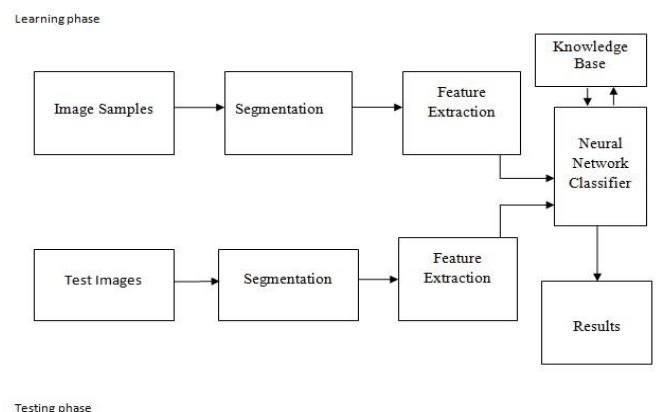

Figure 3: Proposed Methodology

PROCEDURE

It involves two phases learning phase and testing phase. In learning phase after performing segmentation, features extracted from all the vehicle images along with expected output is presented to the neural network. In testing, the Fire truck model (toys) samples from untrained set of samples are used to test the developed ANN model for recognition. From the test images the features are extracted and given to ANN and the corresponding output is checked
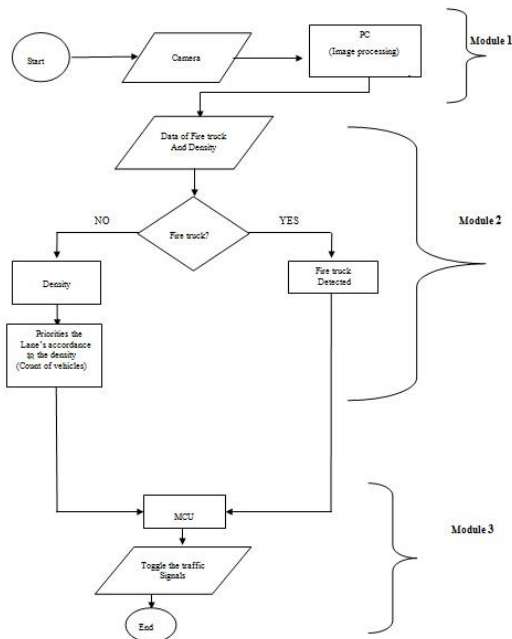
Figure 4: Flow Chart Diagram

MODULE 1: DETECTION

The first module the will be recording vehicles, the frames will be taken from that records and the same is fed to the PC.

MODULE 2: SEGEMENTATION

After taking frames as input, the image is segmented into many parts then feature extraction is done in which colour, texture, shape, size will be analysed. Then the image is compared with stored images then the signals are passed to microcontroller unit (MCU).

MODULE 3: TRACKING AND CONTROLLING

If vehicle detected is Fire truck then MCU transfers the signals to the traffic controller room then the signal is toggled accordingly. If the vehicle detected is not a Fire truck then traffic density is estimated and signal is prioritized accordingly by the MCU and the signal is toggled.

III. RESULTS

BEFORE SIMULATION

Figure 5: Before Simulation

AFTER SIMULATION

Figure 6: After Simulation

IV. CONCLUSION

A typical vehicle will carry tools for a wide range of fire fighting and rescue tasks, with common equipments, We can save many lives and assets by clearing the path for Fire truck.

ACKNOWLEDGMENTS

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