A VISION BASED CONGESTION CONTROL SYSTEM FOR DRIVER'S ASSISTANCE

Akshay Kumar C(312215106009), Gunupati Sumadhura(312215106032), Harini S(312215106034)

SUPERVISOR: Dr. W Jino Hans , Associate Professor , Department of Electronics and Communication Engineering, SSNCE

INTRODUCTION

Traffic is a major area of concern in the recent times. With the increase in the number of vehicles being used, the problem of controlling traffic is getting tedious day-by-day. Time and fuel are wasted because of traffic congestions. According to an article published in the Times of India, congestion in major cities like Delhi, Mumbai, Kolkata and Bangalore costs the economy Rs.1.47 lakh crore annually. Intelligent Transport System is a new application which is aiming at better ways of managing transport and traffic.

Google Maps is one such system which provides information about the status of traffic at a place. But one of the disadvantages with google maps is that it does not give a clear idea of the number of vehicles present at that place. This project aims to overcome the disadvantages that are present in the existing systems. The main advantage of this system is that real time images can be captured and uploaded to cloud which prove to be very useful in providing information about traffic updates.

OBJECTIVES

- To reduce the time and fuel wasted during traffic congestions.
- To increase the traffic efficiency and road safety.
- To enable direct relay of traffic updates to the driver through the information communicated between the vehicles.
- To develop a system that can assist the drivers in taking smart decisions by providing proper updates (E.g. Toll Gates).

EXPERIMENT-METHODOLOGY

- Camera is used to obtain a live stream video, from which frames are extracted and given as input to the localization algorithms.
- HOG descriptors are used to list and describe the important features of the object.
- The next step is to classify the object using Adaboost Classifier. These algorithms are trained with datasets to increase accuracy.
- Localization is done using sliding window technique. Here, windows of different sizes are slid across the images or frames and are fed to the classifier to check the presence of vehicle.
- If the window has a vehicle, then it is retained while all the other windows are discarded.
- The retained windows are then applied to heatmaps through which we localization is complete. Following this count is calculated.
- The calculated count, real time image of vehicles and audio file that is created using Google text to speech converter are combined to a zip file.
- This zip file is uploaded to Dropbox in the name of the place where the data corresponds to and updated regularly

BLOCK / FLOW DIAGRAM

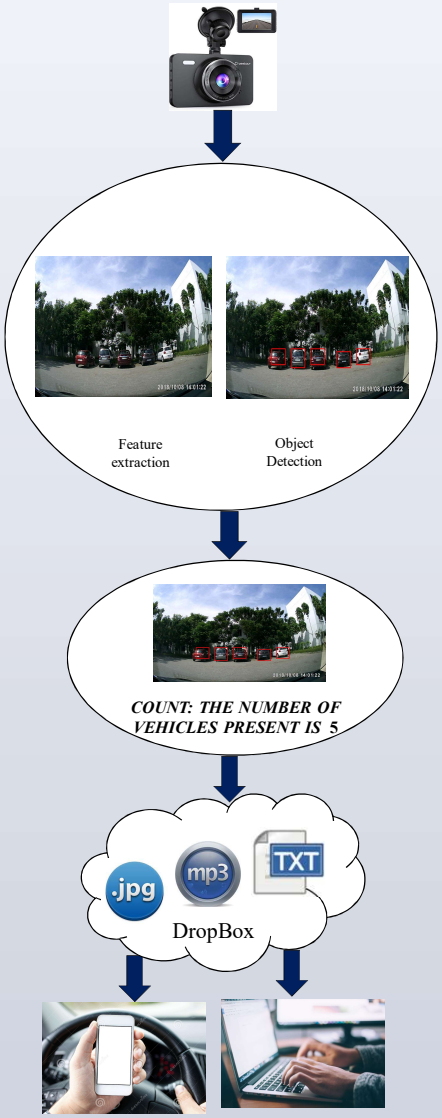

Fig 1. Block Diagram

RESULTS

Fig's 2,3 represent the localization of vehicles using Heatmaps. Fig 4 represents the real time implementation of vehicle localization. Fig's 5, 6,7 show the files that are uploaded to Dropbox

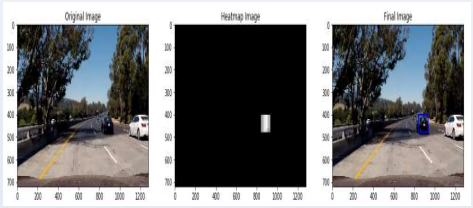

Fig 2. Result of localizing one car

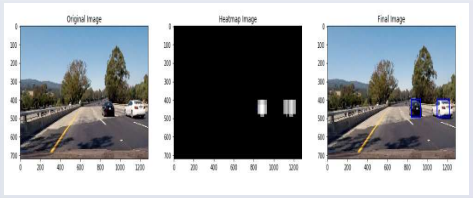

Fig 3. Result of localizing two cars

Fig 4. Real time implementation of the system

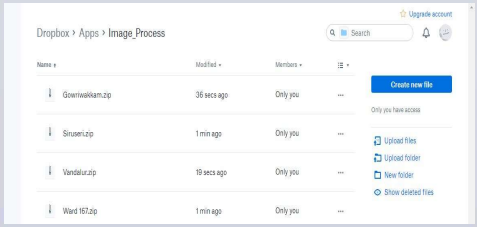

Fig 5. Uploading Zip files to the Dropbox

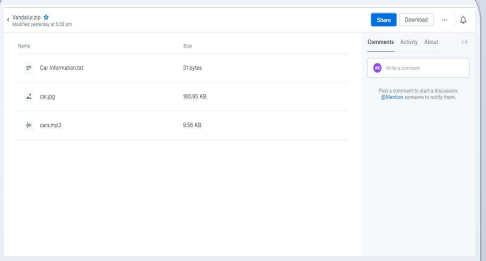

Fig 6. Contents in the Zip file uploaded to Dropbox

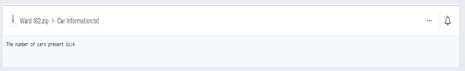

Fig 7. Text file uploaded in Dropbox

Out of 32 cars , 29 were detected with one false positive giving an efficiency of 90%.

CONCLUSION

A system was developed to provide real time traffic updates on a common platform which can be retrieved by any person and used. Finally, a zip file was created which combines an audio file, count of vehicles and an image of the vehicles in the traffic congestion. This zip file was uploaded to Dropbox which can be retrieved by the user by signing in. deletion of the current folders is scheduled properly to give room for new updates. Thus, real time traffic updates were successfully provided to the user.

REFERENCES

1. Banerji, S. Sinha, A. and Liu, C. (2013), 'HaarHOG: Improving the HOG Descriptor for Image Classification,' *IEEE International Conference on Systems, Man, and Cybernetics*, Manchester, pp. 4276-4281.
2. Cengil, E. and Cinars, A. (2017). 'Comparison of HOG (Histogram of Oriented Gradients) and Haar Cascade Algorithms with A Convolutional Neural Network Based Face Detection Approach'.
3. Dalal, N. and Triggs, B. (2005), 'Histograms of oriented gradients for human detection,' IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'05), *San Diego, CA, USA, pp. 886-893 vol. 1.*
4. Wang, Y. Han, P. Lu, X. Wu, R. and J. Huang, (2006), 'The Performance Comparison of Adaboost and SVM Applied to SAR ATR,' CIE International Conference on Radar, Shanghai, pp. 1-4.
5. Zi Yang. Lilian, S.C. Pun-Cheng. (2018), 'Vehicle detection in intelligent transportation systems and its applications under varying environments: A review, Image and Vision Computing',Volume 69.