IMAGE QUALITY ASSESSMENT: FROM ERROR VISIBILITY TO STRUCTURAL SIMILARITY

[1]Vajid Khan, [2]Ajay Pal Singh, [3]Sagar Latake

[1]Assistant Professor, [2]Assistant Professor, [3]Assistant Professor
[1]Department of Computer Engineering,
[1]ISB&M School of Technology, Nande, Pune, India

Abstract: The challenges of vehicle detection in aerial surveillance include camera motions, panning, tilting and rotation. Airborne platforms at different heights result in different sizes of target objects. We design a key point merging method for counting number of cars. This paper mainly consists of screening, feature extraction process, key point classification, grouping of number of key points, merging the key points. Set of consistent key points can be identified by using feature extraction process.

IndexTerms **- Dynamic Bayesian network, Feature extraction process, Keypoint, Object Recognition**

1. Introduction

In day to day fast growing technology, unmanned aerial vehicle has been the most proposed approach for solving object tracking problems.[1] Unmanned aerial vehicle can flight without a pilot. But the proper trajectory path is essential in order to avoid the further damage and collisions. Object without a pilot can acquire information from low altitude and therefore they permit us to gather images in the spatial region. [2].The most common requirement for today is the cars. Research environment is thinking closely towards implementation methods. Estimation of number of objects in parking slot has been the key aspect in urban scenario. [3]There are so many advantages for analyzing the aerial clips. It solves problems in traffic circumstances, military based operations, identifying a particular object in least time. During this process, it covers a much larger spatial area. It also provides strong proof for road detection. In this entire scenario, grey scale images are taken. The image format should be taken as JPEG format. The size of the image is 256 * 256.The required features of a particular object changes with its intensity and existence of shadow. [4] methods were having some partial results. The main challenge is to overcome the existing results and derive some promising results. [5]

2. Related Work

Lin et.al. Proposed a method in which they subtracted background colors of each frame and cleared vehicle candidate regions. However they assumed too many parameters such as the largest and smallest sizes of the vehicles and the height and focus of the airborne camera.
R.Lin, X.Cao, Y.Xu, C.Wu proposed a moving vehicle detection method. The method was based on cascade classifiers. Positive and negative samples are used for the training purpose. Multiscale sliding windows are generated at the detection stage. The major disadvantage of this method is that there are so many false alarms on the moving vehicles. The numbers of false alarms are more as compared to our method.
Hinz and Baumgartner utilized a hierarchical model that describes different levels of details. There is no exact vehicle model which can make the method flexible. However their system would miss vehicles when the contrast is low.
Cheng and Butler considered multiple ideas and used a mixture of experts to merge the ideas for vehicle detection in aerial images. They performed segmentation of colors via mean shift algorithm and motion analysis via change detection. In addition they suggested a trainable sequential maximum a posterior method for Multiscale analysis and enforcement of contextual information. However the motion analysis algorithm applied in their system cannot deal with previously mentioned camera motions and complex background changes. Their work highly depends on color segmentation results.
Choi and Yang proposed a vehicle detection algorithm using the symmetric property of car shapes. However this idea is liable to suffer from false detections such as symmetrical details of buildings or road markings. Therefore they applied a log polar histogram shape detector to verify the shape of the candidates.

3. Implementation Details

A. Proposed work

There are two phases of object recognition. Initial phase and Final phase. In the initial phase, we extract edge, corner and vehicle colors to train a dynamic Bayesian network. In the final phase, we perform background color removal.[6] Later same feature extraction procedure is repeated in the initial phase. The
extracted features serve as the evidence of the trained dynamic Bayesian network. Due to this we can identify whether the keypoint belongs to a vehicle or not. We design a key point wise classification method for object recognition. For edge detection we are using canny edge detector. For corner detection we are using Harris corner detector. The features are extracted using a neighborhood region of each key point.[7]

A.System Proposed Architecture

In the proposed architecture phase, we are dividing the object recognition system using two phases. Initial phase and final phase. In the initial phase, we are taking set of images. Images can be of standard JPEG format. Size of image can be 256 * 256.[8] Image is represented in the form of key points. Feature extraction can be done by using scale invariant feature transform. We convert regional local features into quantitative observations. Dynamic Bayesian network is used for the classification of key points. In the final phase, background color removal is performed. Extraction of data is done by using scale invariant feature transform. [9] In the end, we use morphological operations to enhance the detection task and perform connected component labeling to get the recognition results. Dilation operations and erosion operations are the two morphological operations. [10]

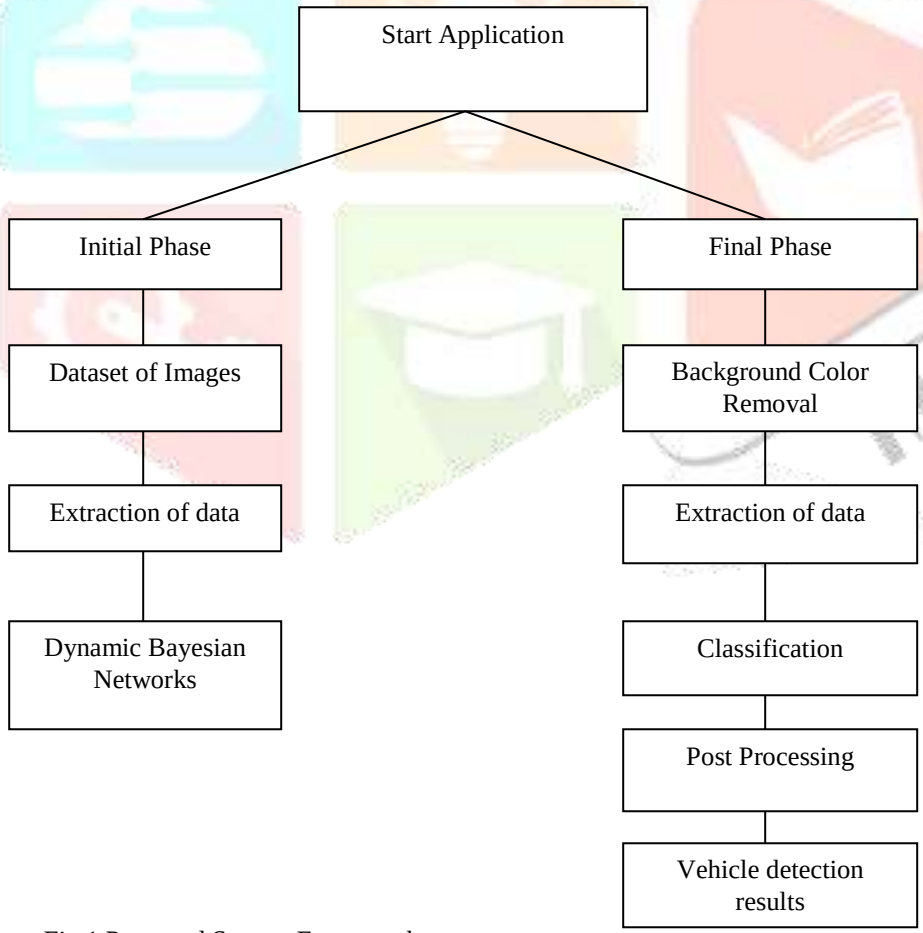

Fig.1 Proposed System Framework

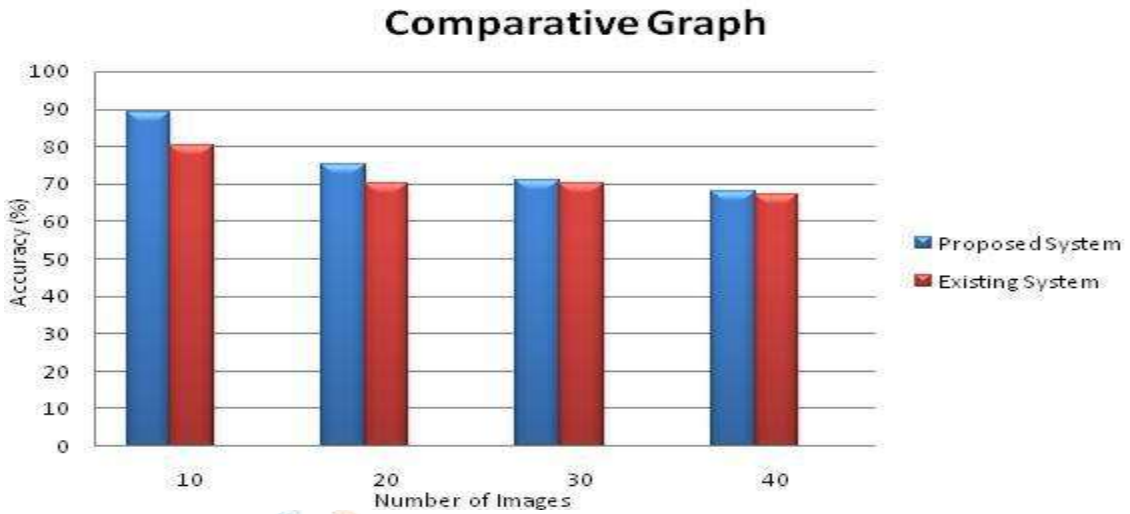

Fig.2 Graph of Accuracy versus Number of Images

	Our		Gleason method		
Image Test	N cars present	True positives	False Positives	True Positives	False Positives
1	51	40	9	24	5
2	31	15	6	12	7
3	19	13	27	2	13
4	15	9	8	6	12
5	3	1	1	1	4
Total	119	78	51	45	42

Table 1. Expected Comparisons of different vehicle detection methods

True positives: Number of samples correctly identified by the total number of cars.
False positives: Number of samples incorrectly identified by the total number of cars.

5. Conclusion

In this way, we have concluded automatic object counting system using car key point merging algorithm. We have performed pixel based computation. Our results exhibit promising accuracy than other existing systems. Automatic car counting and traffic detection in live video frames is our result.

6. Acknowledgement

We take the opportunity to thank Prof.S.K.Asrani, Head of Computer Engineering Department, all the teaching and non-teaching staff of Computer engineering department for their encouragement, support and untiring cooperation.

REFERENCES

[1] Choi and Yang," Vehicle detection from aerial images using local shape information," Adv. Image Video Technol ,Vol.5414, Lecture Notes in Computer Science,pp.227-236, Jan.2009.
[2] Fergus, Perona, and Zisserman, "Object class recognition by unsupervised scale invariant learning" in

Proc.Conf.Comput.Vis.Pattern Recognit.,2003,pp. 264.
[3] Bhatti, U. and Hanif. M. 2010. Validity of Capital Assets Pricing Model.Evidence from KSE-Pakistan.European Journal of Economics, Finance and Administrative Science, 3 (20).