Comparative Analysis of Best Algorithms For Face Detection In a Throng

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ABSTRACT

Face detection become a most emerging and required technology now a days. It detects human faces in digital images. As we saw in the matter of CAA and CAB the crowd emerged their and it is hard t find the culprits. So here, some algorithms help in finding and detecting the faces even in huge mass. In this research paper, we are going to propose the comparatives study between various face detecting algorithms in a crowd. In addition, provide information about the accuracy of these algorithms so that it is easy for anyone to find the face they want to expose. These types of algorithms try to treat mass as a single entity, in order to maintain detection and recognition easier. This study will be helpful in security reasons also, as we can detect face at real time at various traffic places and at crowded places like college fest etc. Some of the algorithms, their brief study and comparative study of best of them will help you to choose better for purpose.

Keywords: CAA , CAB and Best Algo.

I. INTRODUCTION

In this research paper we are going to study comparative studies between various algorithms of face detection in a crowd. These are not general and popular algorithms rather than they are the mixed algorithms who provide great face detection rate. This study will be helpful in security reasons also, as we can detect face at real time at various traffic places and at crowded places like college fest etc. Some of the algorithms, their brief study and also comparative study of best of them will help you to choose better for your purpose.

II. Brief Study of Algorithms For Face Detection

A. Open CV using Haar Cascade Classifiers :

Open CV is the strongest python module used in the field of face detection. Open CV using Haar Cascade Classifiers also leads among all the algorithms for face detection. This algorithm works on predefined classifiers either face (1) or not a face(0) . Classifiers are trained with thousands of pictures from available database in order to get more accuracy. This method contains four steps:

a. Haar Feature selection
b. Creating Integral Images
c. Adaboost Training
d. Cascading Classifiers

Feature extraction plays an important role in Haar Cascade Classifier algorithm, hence will be done as

follows. We have to provide some basic parameters for further proceedings. Parameters are scale Factor, minNeighbors and minSize. Like if we have 9 faces available in the picture then the parameters will be scale Factor =1. 1, minNeighbor =5 and minSize(1, 1) .
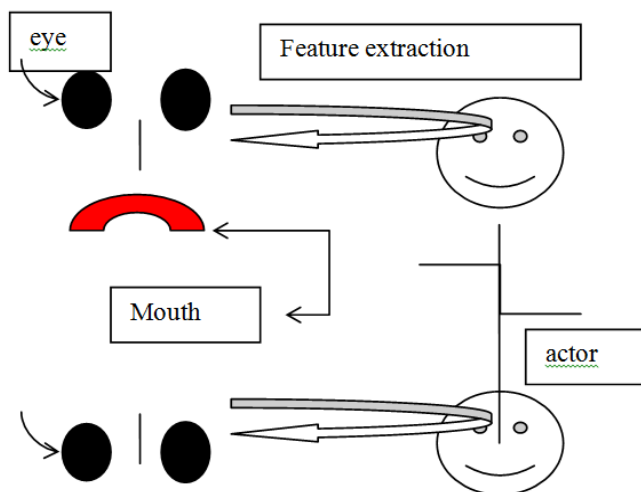
Conclusion is that this algorithm is useful when there is any human face detects. It will not give any result regarding non human face like any animal except monkey (experimentally proved). The algorithm will not detect the number of faces until and unless we provide the values of the parameters.

B.Using Deep Convolution Neural Networks : Face detection specially in a crowd is becoming more challenging. Various algorithms are present over there but due to their poor results they all are considered as of low accuracy. In this work, they used a novel approach of considering the existing semantics segmentation methods to identify faces and still images. They also used the Labeled Faces in the Wild(LFW) database for the comparison of performance of this algorithm among different subsets.

Results provided by this algorithm is fair enough and the accuracy rate of this algorithm for the crowd analysis is also higher in comparison of others.

C.Robust Multi- Model Approach: This algorithm consists of hybrid approach followed by skin color segmentation and a histogram of oriented gradients(HOG) in Support Vector Machine(SVM) features. This algorithm firstly enhance the image quality in order to increase the detection rate. Further steps include an edge preserving pyramidal approach for image representation followed by next step of skin color detection under a combination of YCbCr and RGB and at last the HOG features are then extracted.

This approach has an accuracy rate of 98.02%. It is experimentally proved in the reference paper and will be shown by following experimental table.

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Table- II: Performance evaluation table

Method	Total faces	CDC	FDC	MR
HOG skin color segmentation+	1121	71.36	4.46	28.63
HOG	1121	78.14	4.46	21.85

D.Crowd Detection From Still Images: This algorithm works on detecting human faces from still photographs taking from videos. Algorithm first detect the crowd in the picture by continuous model scale model generation. The work specifically considers human crowds, as the type that is usually of most concentrated in practise. It is impossible to detect individually this will decrease the efficiency of the algorithm, so this algorithm beneficial there to treat the whole mass as a single entity. This algorithm is useful for still pictures not for real time.

E.Real Detection Low Resolution Surveillance Videos: Videos cameras are in used for security reasons. Identifying a person in real time such as a culprit is high in demand. Many researchers are doing their research in the area of low quality of the video. They proposed a typical solution in their research paper which is based on Parallel Gunnar Farenback Optical Flow algorithm followed by Haar Cascade and local binary. They used these algorithms together in order to make accuracy rate 50%.

This result is tested on Caviar Database will proved that this given solution is far better than other algorithms for face detection in mass.

These pictures are taken from the video made on March8, 2018

Comparison Between Best Algorithms For Accuracy

Here is the comparison table and charts between the most useful and accurate algorithms mentioned

III. RESULTS AND DISCUSSION

Efficiency rate of Algo

Chart showing efficiency comparison.

| Algo1 | Algo | Algo3 |
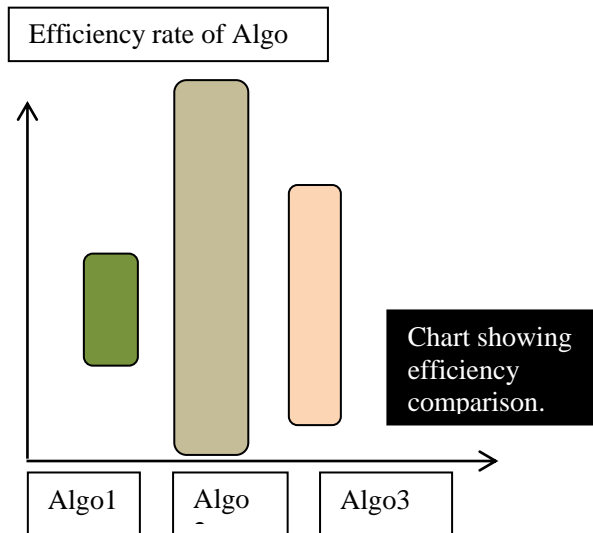
Algorithms	OpenCv using Haar Cascade	Robust Multi-Model Approach	Real Detection Low Resolution Surveillance Videos
Efficiency in %	20	98.02	50
Face Detection Rate in %	60(when all faces are of humans)	81.36	70.05
Average Execution Time	2.05 min OR 125 sec	45 sec	58 ec

V. CONCLUSION

This paper basically analysis the hybrid algorithm used for face detection in throng and the proposed methodologies really useful in case of multiple detection of faces in mass. A brief introduction and comparison about these methods will help to decide Best algorithm is more favourable for them and hence more correctness. Motive of this paper is to present an idea that the algorithm having high accuracy rate and will proved more advantageous in the field of security also.

VI. REFERENCES

[1]. C. L. Devasena, R. Revathi, and M. Hemalatha, "Video surveillance systems, a survey," IJCSI International Journal of Computer Science Issues, vol. 8, 2011.

[2]. https://cs.adelaide.edu.au/~jinyu/Pubs/YuChiSut11.pdf

[3]. M. A. Fischler and R. C. Bolles. Random sample consensus: Aparadigmformodelfittingwithapplicationstoimage analysis and automated cartography. Communications of the ACM, 24(6):381–395, 1981. 2041

[4]. D. M. Gavrila. Pedestrian detection from a moving vehicle. In Proc. European

[5]. Conference on Computer Vision (ECCV), 2:37–49, 2000.

[6]. D. Kong, D. Gray, and H. Tao. A viewpoint invariant approach for crowd counting.

[7]. In Proc. IEEE International Conference on Pattern Recognition (ICPR), 3:1187–1190, 2006.

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