Object Tracking In Video Surveillance

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Abstract

This Attendance management is very important and popular method to maintain the record of work hours of everyone in organization. The Object tracking in video surveillance used for multiple areas such as college, university, business organizations. It is simple method to calculate how many students are present or absent. Schools and colleges are using attendance system so that they will give marks to students based on their attendance at submission time. Multiple methods are available for calculating attendance i.e. Attendance using pen and paper, fingerprit attendance system, RFID based attendance system, wireless iris recognition attendance management system ,real time human face detection and tracking, automated attendance management system using face recognition, attendance management system using SMART-FR, robust and real time face detection. ***Keywords*—**
OpenCV,Anaconda,Matlab.

I. INTRODUCTION

This Attendance management system which is used for calculate the attendance. Multiple methods are used to calculate the attendance. Fingerprint based attendance system, this method is used to calculate attendance. RFID based attendance system Radio frequency identification it is used for identify and track the tag for implemented on object.Object tracking in video surveillance based on face recognition. We are using image processing having image acquisition, database development, face detection, pre-processing, feature extraction and classification .Moving object detection is an important aspect in any surveillance applications such as video analysis, video communication, traffic control, medical imaging, and military service . The camera(s) position will affect the selection of an appropriate technique for face detection. Object tracking in video surveillance is working properly to calculate the accurate attendance. In this project input is video and we detect faces & store in & out times for each student. All data stored in sheet so it is easy to maintain attendance of students. For developing our proposed system we use Python for Desktop application and open CV for Image processing.

II. LITERATURE REVIEW

This method proposed by Jalan Taylor, that is use automated attendance capture and tracking system is used for attendance of students. Here we are using image processing to detect face of students. In & out time for each student will be updated into sheet that will be act as attendance sheet.

III. METHODOLOGY

Python – Overview

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

OpenCV

OpenCV is a cross-platform library using which we can develop real-time **computer vision applications**. It mainly focuses on image processing, video capture and analysis including features like face detection and object detection.This class comprises of two data parts: the **header** and a **pointer**

Project Design

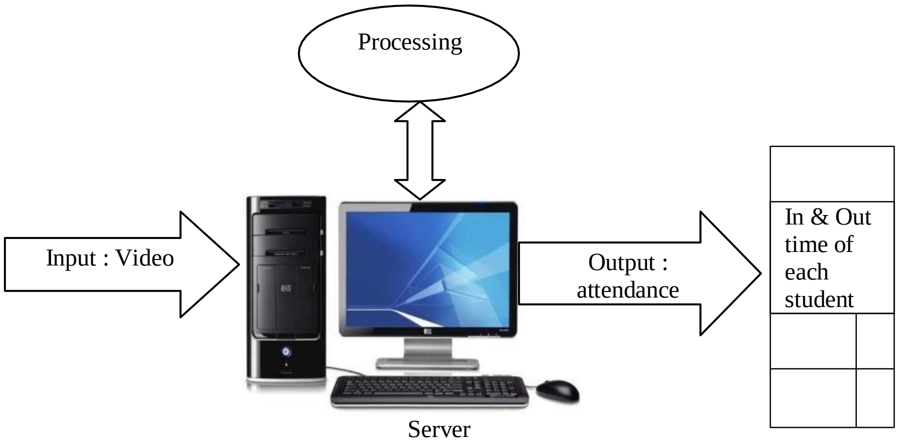


Fig: System architecture

System Algorithm

Face Detection using Viola-Jones Algorithm

The Viola-Jones algorithm is a widely used mechanism for object detection. The main property of this algorithm is that training is slow, but detection is fast. This algorithm uses Haar basis feature filters, so it does not use multiplications.

The algorithm has four stages:

- Haar Feature Selection
- Creating an Integral Image
- Adaboost Training
- Cascading Classifiers

The efficiency of the Viola-Jones algorithm can be significantly increased by first generating the integral image.

$$II(y,x) = \sum_{p=0}^{y} \sum_{q=0}^{x} Y(p,q)$$

The integral image allows integrals for the Haar extractors to be calculated by adding only four numbers. For example, the image integral of area ABCD (Fig.1) is calculated as $II(y_A,x_A) - II(y_B,x_B) - II(y_C,x_C) + II(y_D,x_D)$.

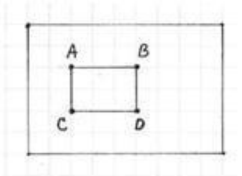


Fig.1 Image area integration using integral image

Detection happens inside a detection window. A minimum and maximum window size is chosen, and for each size a sliding step size is chosen. Then the detection window is moved across the image as follows:

Set the minimum window size, and sliding step corresponding to that size.

For the chosen window size, slide the window vertically and horizontally with the same step. At each step, a set of *N* face recognition filters is applied. If one filter gives a positive answer, the face is detected in the current widow.If the size of the window is the maximum size stop the procedure. Otherwise increase the size of the window and corresponding sliding step to the next chosen size and go to the step 2.

Each face recognition filter (from the set of *N* filters) contains a set of cascade-connected classifiers. Each classifier looks at a rectangular subset of the detection window and determines if it looks like a face. If it does, the next classifier is applied. If all classifiers give a positive answer, the filter gives a positive answer and the face is recognized. Otherwise the next filter in the set of *N* filters is run. Each classifier is composed of Haar feature extractors (weak classifiers). Each Haar feature is the weighted sum of 2-D integrals of small rectangular areas attached to each other. The weights may take values ±1. Fig.2 shows examples of Haar features relative to the enclosing detection window. Gray areas have a positive weight and white areas have a negative weight. Haar feature extractors are scaled with respect to the detection window size.

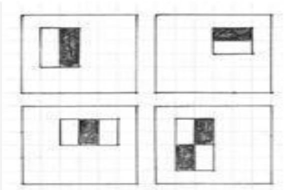


Fig.2 Example rectangle features shown relative to the enclosing detection window

Haar Features

All human faces share some similar properties. These regularities may be matched using Haar Features.

A few properties common to human faces:

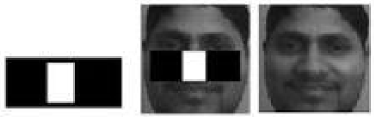
The eye region is darker than the upper-cheeks.

The nose bridge region is brighter than the eyes.

Composition of properties forming matchable facial features:

Location and size: eyes, mouth, bridge of nose

Value: oriented gradients of pixel intensities.



Haar Feature that looks similar to the bridge of the nose is applied onto the face

Haar Feature that looks similar to the eye region which is darker than the upper cheeks is applied onto a face

A. *Figure Captions*

Integral images are easy to understand, they are constructed by simply taking the sum of the luminance values above and to the left of a pixel in an image(e.g.Fig1). Viola and Jones make note of the fact that the integral image is effectively the double integral of the sample image(e.g.Fig2), first along the rows then along the columns. Integral images are equivalent to summed-area tables, yet their use is not texture mapping, being so, their implementation us quite well documented.

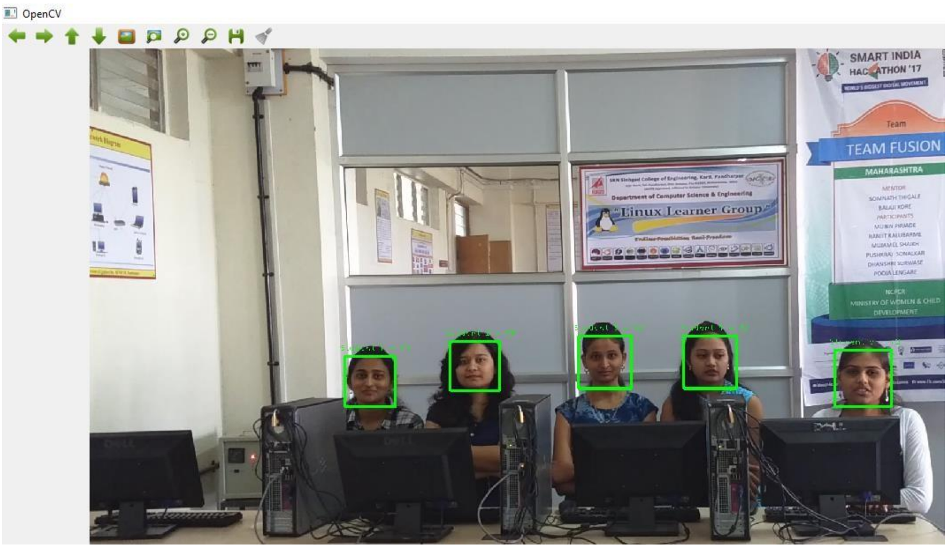


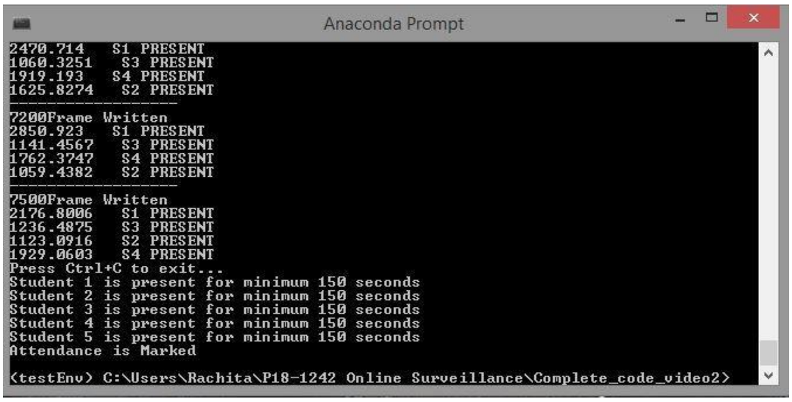
Fig. 1 Example of an image with acceptable resolution

Fig. 2 Example of an unacceptable low-resolution image

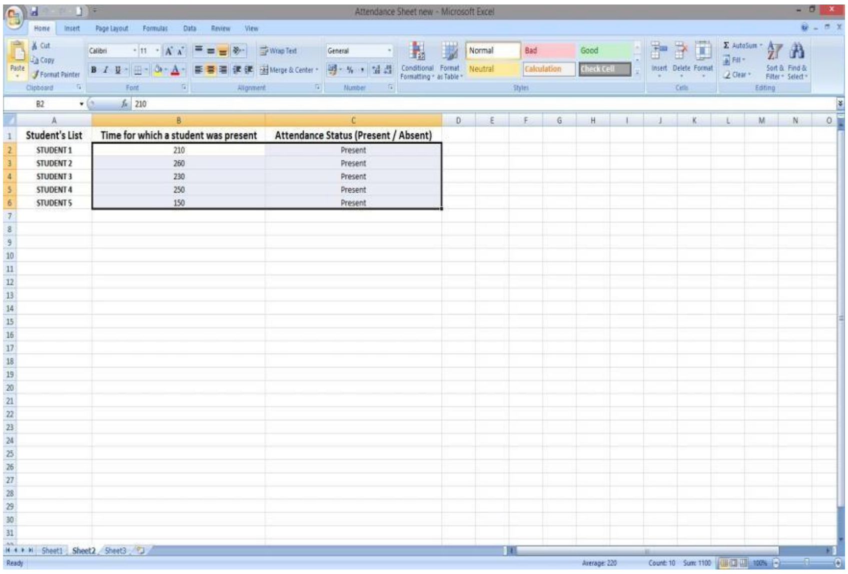
B. In order to be successful a face detection algorithm must possess two key features, accuracy and speed. There is generally a trade-off between the two. Through the use of a new image representation, termed integral images, Viola and Jones describe a means for fast feature evaluation, and this proves to be an effective means to speed up the classification task of the system

C. Results:

Performance Analysis



Final Result



CONCLUSIONS

It can be concluded that the Object tracking in video surveillance system can be very useful for the monitoring of students. This system can play important role in current world of education. So, this system -"To develop a system to automatically detect In & Out time for each student". Object tracking in video surveillance is working properly to calculate the accurate attendance. In this project input is video and we detect faces & store in & out times for each student. All data stored in sheet so it is easy to maintain attendance of students.

FUTURE SCOPE

Object tracking in video surveillance is working properly to calculate the accurate attendance. In this project input is video and we detect faces & store in & out times for each student. All data stored in sheet so it is easy to maintain attendance of students. For developing our proposed system we use Python for Desktop application and open CV for Image processing.

REFERENCES

[1] Qi Zang and Reinhard Klette CITR, Computer Science Department, The University of Auckland Tamaki Campus, Auckland, New Zealand -" Object Classification and Tracking in Video Surveillance".

[2] 1Mr. Rahul V. Patil, 2Mrs. S.B.Bangar " Review Paper On: Video Surveillance Based Attendance System" , Volume 4, Issue 2, February -2017.

[3] M. Sahasri 1 , C. Gireesh2 -" Object Motion Detection and Tracking for Video Surveillance", International Journal of Engineering Trends and Technology (IJETT) – Special Issue – April 2017.

[4] K. Kalirajan1 and M. Sudha2 -" Moving Object Detection for Video Surveillance".

[5] 5]Y. Li, S. Gong, and H. Liddell. Support vector regression and classification based multi-view face detection and recognition. In IEEE International Conference on Automatic Face and Gesture Recognition, March 2000.

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