

## Video Analytics

Prof. Akanksha Bhargava<sup>1</sup>, Santosh Gaikwad<sup>2</sup>, Mayur Bangar<sup>3</sup>, Vijay Chalke<sup>4</sup>  
<sup>1,2,3,4</sup>(Electronics and Telecommunications, Atharva College Of Engineering, India)

**Abstract :** In today's world, face recognition is an important part for the purpose of security and surveillance. Hence there is a need for an efficient and cost effective system. Video analytics or intelligent video surveillance (IVS) is a technology that uses software to automatically identify Specific objects, behavior or attitudes in video footage. Face detection applications employ algorithms focused on detecting human faces within larger images that might contain landscapes, objects and other parts of humans. Video Analytics helps security and public safety organizations develop comprehensive security, intelligence and investigative capabilities using video. Now to provide two level security we have added abnormal activity detection feature with face recognition to our proposed system. This is done by using hardware section. Thus our system will provide automatic monitoring to protect our important things from intruders in efficient and efficient way.

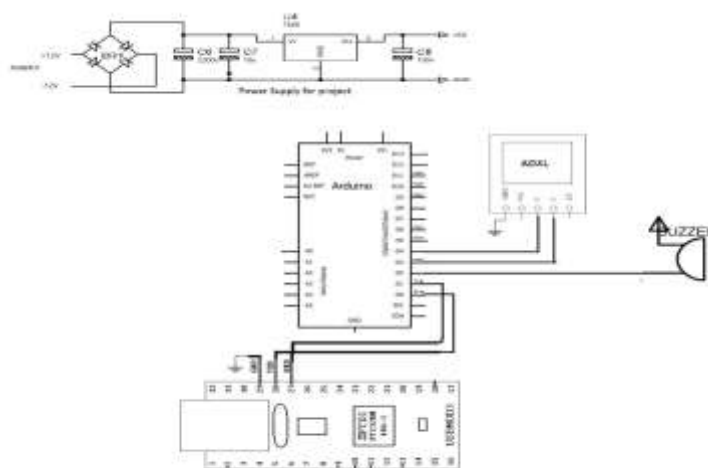
**Keywords** -Cascade Classifier , Face Recognition , PCA (Principal component Analysis), MATLAB (matrix laboratory) , VIOLA-JONES algorithm .

### I. Introduction

Video Analytics is enabling a rapidly growing number of embedded video products such as smart cameras and intelligent digital video recorders (DVRs) with automated capabilities that just a few years ago would have required human monitoring. Broadly, video analytics is the extraction of meaningful and relevant information from digital video. The goal of video analytics is scene understanding, which differs from motion detection. In addition to detecting motion, analytics qualifies the motion as an object, understands the context around the object, and is able to track the object through the scene.

For instance, video analytics is used for automated surveillance. Smart cameras with analytics continuously analyze video and can detect the presence of people and vehicles and interpret their activities. Suspicious activities such as loitering or moving into an unauthorized area are automatically flagged and forwarded to security personnel. In transportation, cameras can capture and recognize license plate numbers for enforcement and toll collection purposes. In retail, video analytics can count the number of people waiting in line or passing through an aisle. These applications are currently in commercial use, with more sophisticated analysis techniques and broader applications expected in the coming years.

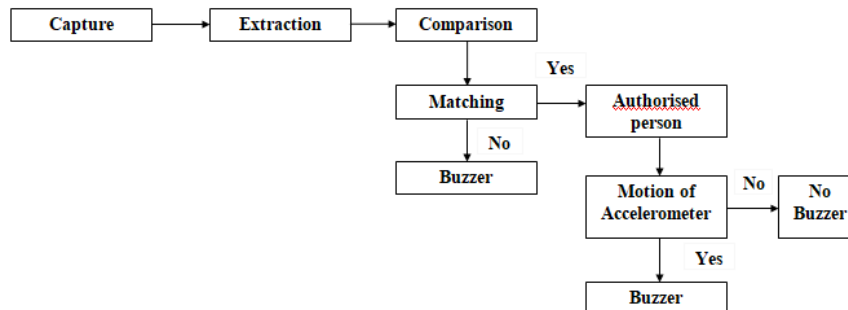
### II. block diagram



Initially we will register the face of authorized person and store it in database. After registering authorized face in our database, then the camera comes into action and our system will start to detect the other faces. For face detection we have used VIOLA-JONES algorithm which extract the features of the detected face. After extracting the features the HAAR cascade classifier compares the current detected face with the face stored in the database. Aim of the project is to allow only authorized person and gives BUZZER to intruder. Now to provide two level security we have added abnormal activity detection feature to our proposed system.

This is done by using hardware section includes ARDUINO-UNO as a controller and AD XL335 ACCELEROMETER which gives BUZZER . If an intruder attacks the locker or safe box with hammer or if he would try to unlock the locker without key. Thus our system will provide automatic monitoring to protect our important things from intruders in efficient and effective way.

### III. Methodology



The Functionality of this system is mainly categorized in following steps.

- To enroll and detect faces using camera Connected to the PC or camera in laptop.
- To display the match status on the LCD as well as the terminal running on the VGA (Video graphics array) monitor.
- To program for the same using C programming in MATLAB. The code imports certain modules that enable functions such as face recognition.
- Connect Arduino to PC using USB to TTL connection.
- Arduino is programmed to detect motion of Accelerometer and passes signal to Buzzer.

### IV. System Description

#### Software Description:

To design this system we are using MATLAB software for face recognition and monitoring purpose. MATLAB (matrix laboratory) is a multi-paradigm numerical computing environment. A proprietary programming language developed by MathWorks, MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C, C++, C#, Java, Fortran and Python. Arduino integrated development environment (IDE), is a cross-platform application written in the programming language Java. It originated from the IDE for the languages Processing and Wiring. It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic indenting, brace matching, and syntax highlighting, and provides simple one-click mechanisms to compile and upload programs to an Arduino board.

#### Hardware Description:

The Hardware section consist of various devices which are listed below:

1. Camera: A camera is an optical instrument for recording or capturing images, videos which may be stored locally, transmitted to another location, or both.
2. Computer or Laptop: It is used to install necessary, compatible softwares and for monitoring.
3. USB to TTL serial cable: This is a USB to TTL Serial Cable which allows for a simple way to connect TTL interface devices to USB.
4. Arduino UNO: It is mainly used for abnormal activity detection. It acts as a controller to control Accelerometer AD XL335.
5. Accelerometer AD XL335: We are using accelerometer to detect the abnormal activity done by an intruder. The ADXL335 is a small, thin, low power, complete 3-axis accelerometer with signal conditioned voltage outputs.

### V. Conclusion

Video analytics software was created to help review the growing hours of surveillance video that a security guard or system manager may never have time to watch - your video surveillance system is only as useful as the incidents you can actually capture and watch, and video analytics will help you find them.

Using video analytics makes your surveillance system more efficient, reduces the workload on security and management staff, and helps you capture the full value of security video by making your IP camera system

more intelligent in its work. Deep learning makes video analytics more effective and efficient. It also enables installers and integrators to work more closely with their customers, and for those customers to realise greater benefits from their investment.

### Features

1. Unprecedented Scalability And Flexibility.
2. Human/Non-human Detection.
3. Automated and Adaptive Modelling.
4. Flexible Automatic Alert Generation.

### Applications

1. Stadiums - Suspicious Person Detection, Abandoned Object Detection
2. Banks - Suspicious Person Detection
3. Airports- Suspicious Person Detection, Abandoned Object Detection
4. Railway/Metro Stations- Suspicious Person Detection, Abandoned Object Detection
5. Automatic Number Plate Recognition
6. Perimeter Intrusion Detection System

### Future Scope

1. To detect harmful equipments through video frames.
2. Attendance System
3. Fire or Smoke Detection

### Acknowledgements

It gives a great pleasure to present this paper on “VIDEO ANALYTICS (Real time face Recognition and Abnormal Activity Detection)”. While working on this project, we found great opportunity to express our sincere regards, deep sense of gratitude and thanks to our project guide Prof. Akanksha Bhargava for her valuable suggestions, valuable inputs, able guidance, encouragement, whole-hearted co-operation and constructive criticism, support and timely guidance at every step during course of our project.

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