

Surveillance for Online Examination

¹Prof. Swapnil Wani, ²Abhishek Vijay Shinde, ³Rajeev Sudhir Mayekar, ⁴Vinayak Sanjay Mane

¹Asst. Professor, ^{2,3,4}UG Student, ^{1,2,3,4}Computer Engg. Dept. Shivajirao S. Jondhle College of

Engineering & Technology, Asangaon, Maharashtra, India

¹swapnilwani24@hotmail.com, ²·abhishekshinde0961@gmail.com ³mayekar.rajeev@gmail.com ⁴vinumane55544@gmail.com

Abstract— Surveillance for online exam framework can track understudies and recognize suspicious circumstances by utilizing web camera. Computerization is utilized as a part of complex circumstances to decrease the workload put on the human administrator and thusly to build the efficiency and improve the execution. Moreover, contingent upon robotization isn't just identified with the exactness of the framework yet in addition to the human administrators' dependence on programmed framework.

Keywords—Examination, Video, Students, Surveillance, Viola Jones, Pitch Detection.

I. INTRODUCTION

Surveillance for online exam is the checking of the conduct, exercises, or other changing data of understudies. This incorporates perception from a separation by utilizing web camera. Reconnaissance is exceptionally helpful to keep up social control, perceive and screen dangers and avert/examine misbehaviour exercises. Reconnaissance framework utilize web camera to observe understudy. Customarily various surveillance cameras are situated all through a territory, connected to a PC screen. Sadly, directors can't screen tremendous group with number of understudy.

Surveillance [1] for online exam framework can track understudies and identify suspicious circumstances by utilizing web camera. Mechanization is utilized as a part of complex circumstances to lessen the workload put on the human administrator and thusly to expand the profitability and improve the execution. Besides, contingent upon mechanization isn't just identified with the precision of the framework yet additionally to the human administrators' dependence on programmed framework. The outline of observation for online exam frameworks can decide the level of unwavering quality and increment the viability of the reconnaissance. Mounting camcorders is shoddy, however finding accessible HR to watch the yield is costly. So the primary component of this framework is it gives pictures snap which are imperative as for administrator. With snap pictures it gives sound record additionally for that specific time. This framework portray a computerized multi-camera video observation framework which can track understudies and identify diverse suspicious circumstances.

II. LITERATURE SURVEY

A. Viola Jones Face Detection Algorithm (Proposed)

The Viola–Jones [2] object detection framework is the first object detection framework to provide competitive object detection rates in real-time proposed in 2001 by Paul Viola and Michael Jones. Despite that it can be trained to detect a variety of object classes, it was motivated mainly by the problem of face detection. The features sought by the detection framework universally involve the sums of image pixels within rectangular areas. As such, they bear some resemblance to Haar basis functions, which have been used previously in the realm of image-based object detection.

• Viola-Jones algorithm

Step 1: With K attributes (e.g., K = 160,000) we have 160,000 different decision stumps to choose from

Step 2: At each stage of boosting

- Given reweighted data from previous stage
- Train all K (160,000) single-feature perceptron's
- Select the single best classifier at this stage

Combine it with the other previously selected classifiers Learn all K classifiers again, select the best, combine, reweight

Repeat until you have T classifiers selected Step 3: Very computationally intensive . Learning K decision stumps T times Step 4: End

B. Local Binary Pattern (LBP)

The local binary pattern (LBP) technique is very effective to describe the image texture features. LBP has advantages such as high-speed computation and rotation invariance, which facilitates the broad usage in the fields of image retrieval, texture examination, face recognition, image segmentation, etc. Recently, LBP was successfully applied to the detection of moving objects via background subtraction. In LBP, each pixel is allotted a surface esteem, which can be normally joined with focus for following thermo realistic and monochromatic video.

C. Ada Boost Algorithm for Face Detection

Boosting is an approach to machine learning based on the idea of creating a highly accurate prediction rule by combining many relatively weak and incorrect rules. The Ada-Boost algorithm was the first practical boosting algorithm, and one of the most widely used and studied, with applications in numerous field. Using boosting algorithm to train a classifier which is capable of processing images rapidly while having high detection rates. Ada-Boost is a learning calculation which delivers a solid classifier by



picking visual highlights in a group of basic classifiers and consolidating them straightly.

D. Neural Network-Based Face Detection

It exhibits a neural system based upright frontal face discovery framework. A sanely appended neural system looks at little windows of a picture, and picks whether every window contains a face.

A Neural System Based Channel The main part of our framework is a channel that gets as info a 20x20 pixel locale of the photo, and create a yield running from 1 to - 1, implying the nearness or nonappearance of a face, correspondingly. To recognize faces wherever in the information, the channel is connected at all area in the picture.

E. Pitch detection algorithm (Proposed)

A PDA [3] commonly evaluates the time of a quasiperiodic flag, at that point modifies that incentive to give the recurrence. One straightforward approach is measure the separation between zero intersection purposes of the flag (i.e. the zero-intersection rate). A threshold value is set accordingly to a normal human voice.

Algorithm :

Step 1: Detect Speech

Step 2: Segmentation 30ms, overlap 20ms

Step 3: Computation of segment energy.

Step 4: Computation of NCCF function in range of lags from 16 to 160.

Step 5: Normalization of calculated values auto correlation function.

Step 6: Find position and value of cross correlation peak.

Step 7: Voice/ Unvoiced decision

Step 8: Median filtering

Step 9: Pitch value

Step 10: End

F. VOICE ACTIVITY DETECTION

Voice action discovery (VAD) has applications in an assortment of settings, for example, discourse coding, programmed discourse acknowledgment (ASR), speaker and dialect ID, and discourse upgrade. Cutting edge VAD strategies incorporate both directed and unsupervised methodologies. Supervised methods, which are often based on either Gaussian mixture models (GMM), hidden Markov models (HMM), or multi-layer perceptions (MLP) work well given that pre-trained models for both speech and non-speech classes broadly match the acoustic characteristics of the test environment.

Algorithm	Proposed	Performance	Ac <mark>cur</mark> acy	Quality	Merits	Demerits
	Technique/Algorithm					
Viola Jones	Face Detection Algorithm	It is faster than	It shows	It detect	It is the most admired	Limited head
Face Detection	nte	other face	acc <mark>ura</mark> te output	better face	algorithms for face detection	poses.
Algorithm	m	detection	than other face	detection	<mark>in r</mark> eal time.	
(Proposed)	atio	algorithm	detection	quality than	ag	
	on		algorithm	other	The main advantage of this	
				algorithm	approach is uncompetitive	
	°U,		$\mathbf{L}\mathbf{A}$		detection speed while	
	10				relatively high detection	
		Forn		olic	accuracy, comparable to	
		Research	h Enginee	ring App	much slower algorithms	
Local Binary	Face Detection Algorithm	It is slower than	It does not	It does not	Detection of moving object	Proposed method
Pattern (LBP)		Viola Jones	show	detect better	via Background Subtraction.	is not sensitive to
		Algorithm	accurate	face quality	Computationally simple than	small changes in
			output as	than Viola	Haar Like feature and fast.	the Face
			viola jones	Jones		Localization.
Ada Boost	Face Detection Algorithm	It is slower than	It does not	It does not	No a prior knowledge. It is	The result
Algorithm for		Viola Jones	show	show	an algorithm which only	depends on the
Face Detection		Algorithm	accurate	accurate	needs two inputs: a training	data and weak
			output as	output as	dataset and a set of features.	classifiers.
			viola jones	viola jones		
Neural	Face Detection Algorithm	It is slower than	It does not	It does not	The algorithm can detect	The detection
Network-Based		Viola Jones	show	detect better	between 78.9% and 90.5%	process is slow
Face Detection		Algorithm	accurate	face quality	of faces in a set of 130 test	due to train the
			output as	than Viola	images, with an satisfactory	non-face
			viola jones	Jones	number of false detections.	window.



International Journal for Research in Engineering Application & Management (IJREAM) ISSN: 2454-9150 Special Issue - iCreate April - 2018

РІТСН /	Voice Detection Algorithm	It is faster than	It record	It detect	Pitch is the most basic	The entire
THRESHOLD		other voice	accurate	better voice	characteristic of voice. So by	process of
DETECTION		detection	audio and	and speech	detecting the pitch we can do	detection of pitch
ALGORITHM		algorithm	speech	quality	many other things like	is very complex
(Proposed)					intensity and timbre	and difficult to
					detection.	implement.
VOICE	Voice Detection Algorithm	It is slower than	It does not	It does not	Use some classifier to get a	The hardest case
ACTIVITY		Pitch detection	show	show	likelihood of speech from	for VAD is a
DETECTION		algorithm	accurate	accurate	the features.	situation where
			output as	output as		there are
			Pitch	Pitch		multiple
			detection	detection		speakers or
			algorithm	algorithm		speech on the
						background.

TableNo.1: Comparative Study

III. EXISTING SYSTEM

As the Web and web innovation is becoming speedier in this profoundly IT-empowered world, the present student generation is getting more connected with the online assets more than the books. The Internet is the biggest storage facility of Training assets to understudies. According to the watched measurements, around 5.6 million understudies select no less than one online course inside a year. The measurement says that the students who take online direction perform much superior to anything the individuals who are taking up close and personal conventional classroom training. Presently a-days online training framework is particularly dependable to each understudy. Be that as it may, there has a central issue with respect to the online exam security. In this, venture proposed a solid online examination framework which depends on strict online security and genuine competitor confirmation. Here the midway worked control room will assume control over every one of the exercises going ahead in the approved focuses through the cameras those are designed in each middle.

Cameras with independent video server machines inside create MPEG, MJPEG, or H.264 pictures. These pictures are influenced accessible to different gadgets on the system through a standard IP to organize interface. Observing and recording can be performed by totally programming based system video recorders (NVRs) running on standard PC equipment. Propelled video investigation programming can be utilized to consequently distinguish suspicious occasions or conduct without having to constantly screen handfuls or several screens.

IV. PROBLEM STATEMENT

Not at all like other online surveillance examination frameworks this site ought not be only for the students, rather it ought to likewise give office to Organizations to have online Tests/Exams. This will help foundations as:

• There will be no need to get new software every time to conduct an online test like other online websites.

• Sparing additional time of going too far away Exam Center.

• Students need not wait for their results. Also this website will remove the flaws of existing Manual Systems like:

- Reducing the manual labor (Decreases Overheads).
- Avoiding Mistakes Due To Human Error (Accurate).
- Will Increase Efficiency and Save Time.

•Allow Neat Handling Data rather then Error Prone Records.

The foundations will enroll themselves with a one of a kind login name and secret key, the remarkable id will be issued to the organizations by the site. After login, they will enter exam subtle elements like number of inquiries, +ve and -ve marks. At that point they will enter the inquiries alongside the appropriate responses which can later be erased and altered.

V. PROPOSED SYSTEM

The proposed framework point is to build up a mixed media investigation framework to identify a wide assortment of deceiving practices amid an online exam session. The proposed online exam process incorporates two stages, the planning stage and exam stage. In the planning stage, the test taker needs to confirm him before starting the exam, by utilizing a secret key and face confirmation. This stage additionally incorporates alignment steps to guarantee that all sensors are associated and working appropriately. Further, the test taker learns and verbally recognizes the tenets of utilizing the OEP framework, for example, no second individual is permitted in a similar room, the test taker ought not leave the room amid the exam stage, and so forth. These segments are: client confirmation, content discourse discovery, location, dynamic window recognition, look estimation, and telephone identification. From that point onward, the center level highlights inside a fleeting window are combined to produce abnormal state highlights, which are then utilized for preparing and testing a cheat classifier.

The high-level features include the component-dependent features, such as the mean and standard deviation inside a window, and features based on correlation among the segments, such as the covariance features.



VI. SYSTEM ARCHITECTURE



Fig: 1 System Architecture

ALGORITHM:

Step 1: Start

Step 2: Input Original Image

Step 3: Image with face indicators as rectangles

Step 4: Given training sample images (x1, y1), ...,(xn, yn),

where $y_i = 0$, 1 for negative and positive examples respectively.

Step 5: Initialize the classifier count t = 0 and the sample weights wi = 1 2m , 1 2l for yi = 0, 1 respectively, where m

and l are the number of negative and positive samples.

Step 6: While the number of negative samples rejected is less 50%:

(a) Increment t = t + 1.

(b) Normalize the weights wi = Pwi j wj.

(c) Select the best weak classifier with respect to

the weighted error $\Box t = \min f, p, \theta X i wi |h(xi, f, p, \theta) - yi|.$

(d) Define $ht(x) = h(x, ft, pt, \theta t)$ where ft, pt and θt

are the minimizers of t.

(e) Update the weights as wi = wi β 1–ei t , where

 $\beta t = \Box t \ 1 - \Box t$ and ei = 0 if example xi is classified correctly, ei = 1 otherwise.

(f) Compute the strong classifier $H(x) = (1 \text{ PT } t=1 \alpha tht(x) \ge \gamma t \ 0 \text{ otherwise}$, where $\alpha t = \log 1 \beta t$

and γt is chosen such that all positive training samples are correctly classified.

Step 7: Accept this sub-window as a face

Step 8: End

STUDENT MODULE:

Student opens any pre-existing test portal. Student Run our project. Applications capture a snap of students Face and generate Hall Ticket ID.

ADMINISTRATOR MODULE:

Administrator opens his portal. It shows the list of all the students who have attempted the exam using our application.

MULTIMEDIA PROCESSING MODULE:

Data is transferred from student's computer to Server machine. (Client-Server). Audio Processing: Records Audio and sends to Admin for manual check on audio for noise or cheating detection. Webcam Video Feed/Snaps Processing: Image processing comes into а picture. Face orientation detection and it flags the incidents where activity of student detected which will be shown at administrator's portal. Window change detection: Direct disqualification if student happens to change the online exam window to any other window tabs.

VII. MATHEMATICAL MODEL

The Viola-Jones [4] algorithm uses Haar-like features, that is, a scalar product between the image and some Haar-like templates. More precisely, let I and P denote an image and a pattern, both of the same size $N \times N$. The feature associated with pattern P of image I is defined by

$$\sum_{1 \le i \le N} \sum_{1 \le j \le N} I(i,j) \mathbb{1}_{P(i,j) \text{ is white }} - \sum_{1 \le i \le N} \sum_{1 \le j \le N} I(i,j) \mathbb{1}_{P(i,j) \text{ is black}}.$$

To compensate the effect of different lighting conditions, all the images should be mean and variance normalized beforehand. Those images with variance lower than one, having little information of interest in the first place, are left out of consideration.

$$\mathbf{I}(i,j) := \begin{cases} \sum_{1 \le s \le i} \sum_{1 \le t \le j} I(s,t), & 1 \le i \le N \text{ and } 1 \le j \le N \\ 0, & \text{otherwise} \end{cases}$$

is so defined that

Т

$$\sum_{1 \le i \le N_2} \sum_{N_3 \le j \le N_4} I(i, j) = II(N_2, N_4) - II(N_2, N_3 - 1) - II(N_1 - 1, N_4) + II(N_1 - 1, N_3 - 1),$$

holds for all $N1 \le N2$ and $N3 \le N4$. As a result, computing an image's rectangular local sum requires at most four elementary operations given its integral image. Moreover, obtaining the integral image itself can be done in linear time: setting N1 = N2 and N3 = N4 in (1), we find

$$I(N_1, N_3) = II(N_1, N_3) - II(N_1, N_3 - 1) - II(N_1 - 1, N_3) + II(N_1 - 1, N_3 - 1).$$

VIII. RESULT & DISCUSSION

The User first register on the online examination form. After doing the registration, the user can successful login to the examination page. Now the user enters the username and password for logging into the page. After login the user will get a popup window of Webcam and Audio. Then the user should have to take a snap for the hall ticket registration. After taking snap, the user fill the details. Then the user should choose the required exam that to be given. After completing the exam the supervisor(admin) will check the snaps and video/audio of the user.



(
		Registration Form	
	1	First Name	
	:	Select Gender	
	1	Username	
	1	Password	
	1	Confirm Password	
	×	E-Mail Address	
	s.	(639)	

Fig: 2 Registration module of the student

		Hall Ticket Note Down Your Roll Number fo
	Details	
	Name:	
RAJ		
	Roll No.:	
1003		
	Exam:	
Java		
	Date	
04/02/2018		
	Time:	
141512		
	Marks Out Of:	
10		
	Duration:	
10 Minutes		

Fig: 3 Hall Ticket information of the student



Fig: 4 Final result of the student

ADVANTAGES:

- Security and confidentiality: A considerable measure of conceivable outcomes are additionally opened up on exam day as it enables you to advantageously make your own particular test in a safe situation.
- **Easily Update Questions:** Questions can without much of a stretch be blended, as each new question is added to the framework's database. The questions would then be able to be haphazardly drawn from the database.

- **Easily Monitoring**: Supervisor once in a while might be neglected to focus on every one. So there is probability of duping amid exam. Utilizing this application it is diminished
- **Cost saving:** At the point when an exam is put on the web, it brings about huge cost investment funds. The cost of paper, duplicating, and dissemination costs are altogether decreased or disposed of.
- **Time management:** Online examination frameworks make utilization of PCs that aides in sparing time.

IX. CONCLUSION

We have tried to implement "Surveillance For Online Exam" Vishnu Raj R S, Athi Narayanan S, Kamal Bijlani "Heuristic-based Automatic Online Proctoring System" Amrita E- learning Research Lab, Amrira Vishwa Vidyapeetham University, IEEE International Conference On Advanced Learning Technologies, 2015. paper and after implementation we got the conclusion as a strategy for reconnaissance for online exam joining Picture Handling, Sound Preparing and PC observing strategies, for example, change in window tabs while giving exam. In the planning stage, the test taker needs to confirm him before starting the exam, by utilizing a secret key and face confirmation. This stage additionally incorporates alignment steps to guarantee that all sensors are associated and working appropriately. Hence it expels the need to have a delegate all through the examination to control tricking.

REFERENCES

- Vishnu Raj R S, Athi Narayanan S, Kamal Bijlani "Heuristic-based Automatic Online Proctoring System" Amrita E- learning Research Lab, Amrira Vishwa Vidyapeetham University, IEEE International Conference On Advanced Learning Technologies, 2015.
- [2]. Maria De Marsico, Michele Nappi, Daniel Riccio and Harry Wechsler, "Robust Face Recognition for Uncontrolled Pose and Illumination Changes" IEEE Transaction on Systems, Man and Cybernetics, vol.43,No.1,Jan 2013.
- [3]. Shaoxin Li,Xin Liu, Xiujuan Chai, Haihong Zhang, Shihong Lao and Shiguang Shan, "Maximal Likelihood Correspondence Estimation for Face Recognition Across Pose" IEEE Transaction on Image Processing, Vol.23, No.10, Oct 2014.
- [4]. Jyothi S Nayak and Indramma M, "Efficient Face Recognition with Compensation for Aging Variations" IEEE International Conference On Advanced Computing, pp 1-5, Dec2012.
- [5] M. Valera & S. A. Velastin, "Intelligent distributed surveillance systems: a review". Vision, Image and Signal Processing, IEE Proceedings. 192-204, 2005.
- [6]Aakash Trivedi, "A Relevant Online Examination System", T4E 2010