Available online at www.scientiaresearchlibrary.com

Scientia Research Library

ISSN 2348-0424
USA CODEN: JETRB4

Journal of Engineering And Technology Research, 2015, 3 (1):43-47
(*http://www.scientiaresearchlibrary.com/arhcive.php*)

WESTIMATION OF STUDENT'S PERFORMANCE USING WEBCAM MONITORING SYSTEM

Mrs.J.Gnana Jeslin[1a], M Ahamed Irfan[1], R Gnana Sekar[2]

Assistant Professor , Jeppiaar Engineering College[1a]
[1],[2]Department of Information Technology, Jeppiaar Engineering College, Chennai-600119

ABSTRACT

The future of a student is depend upon the interest and skill that is possessed by him. In order to survive in competitive world, self-learning plays a vital role in student's life. If a student is listening to a video tutorial on internet or if he is reading a pdf or notes in his pc, the attention of the student plays a vital role in intaking the information presented in the pdf or in the video tutorial. The aim of our system is to collect the data about student's psychological and emotional aspects by monitoring the student's facial expressions, eye movement, body posture through web cam from the client's machine i.e. PC and sent it to server for processing and estimating the attention percentage through 3D face tracking algorithm. The server will generate the common aspects of the students who are watching the lecture by comparing the results obtained using the tracking system.

Keywords: Eye gaze, Facial Expressions, Beizer Curves, Mesh Node, Video lectures.

.

INTRODUCTION

In current studies, many students acquire knowledge by watching video tutorials on internet as well as studying pdf online as well as in their pc to survive in this competitive world. Even though the student is listening to the video or reading the pdf, Sometimes his attention goes out of the world and it seems to be that the student is reading and listening[1].

But it doesn't. In order to calculate how much a student is attentive when he is reading a document and while listening to a video on internet, we have developed a system based on web camera which is available on every laptop which monitors the student and produces the attention percentage of the students by determining his body postures, eye movements, facial expressions to calculate his emotional and psychological aspects to produce the attention percentage of the students as the final result.

Through this we can able to determine that a student is attentive or not while reading a document or listening to a video[2] .

MATERIALS AND METHOD

CURRENT SYSTEM:

Currently, our educational system gives assignments, study materials, home work, and conducting online as well as class tests to estimate the student's performance. Some organizations are providing online courses to help the students to study remotely. They provide documents and video tutorials in order to teach the students. But there the problem arises what if the student is not able to listen to the video tutorial or in reading the document. Even though providing the necessary documents and videos, the attention of the student watching the video is interrupted. The organization didn't know that the student is fully attentive to it or not.[3]

PROPOSED SYSTEM:

In order to estimate the students attention percentage, our system uses the webcam to monitor the student. It uses 3D face tracking algorithm to determine the student's eye gaze movements, body postures, and facial expressions to calculate the psychological and emotional aspects of the students and sent it to the server for further processing.

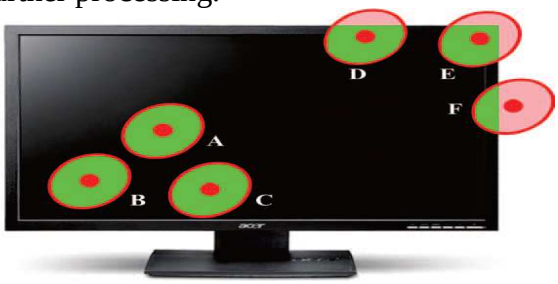
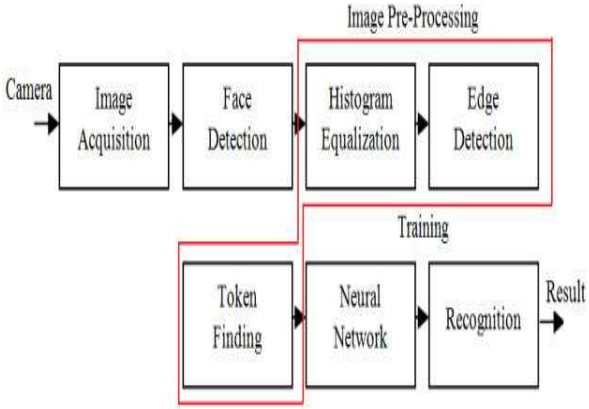


Fig1: Estimation of students eye gaze position by the webcam present in our pc, laptops, etc.,[4]

The 3D face tracking algorithm uses beizer curves containing control points[9] in order to track the facial expressions. The changes in the control points leads to the changes in the facial expressions. The data collected from the 3D face tracking system on the client side is sent to the server for processing.



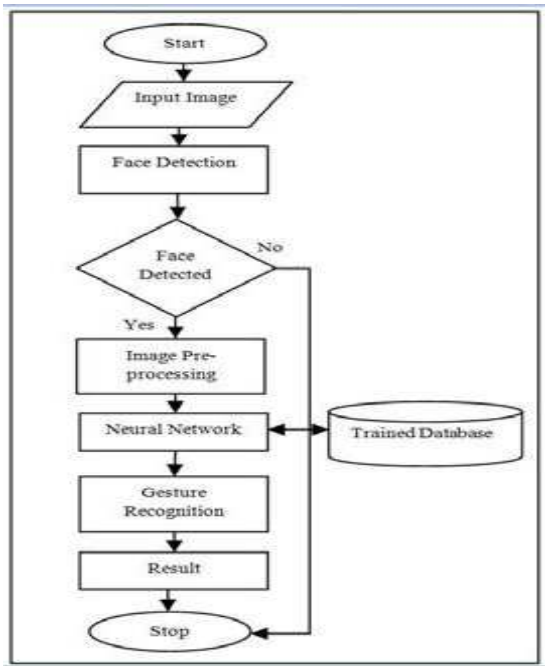


Fig2: a) Block Diagram for face detection and recognition)Flow chart for explaining the face recognition.

the results are generated in order to calculate the attention percentage of the student. The 3D face tracking system comprises of mesh nodes on the face and control points in the beizer curves as shown below[5].

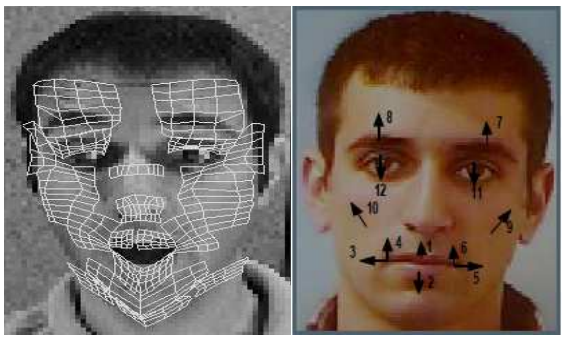


Fig3: a) Mesh nodes in the face b) Projection vectors created using the mesh nodes.

Each motion in the face represents the deformation on the face defined as beizer volume control parameters[8]. We refer to this motion vectors as motion units(MU). With the help of these motion vectors and the control points, we calculate the facial expressions[11] of the student using the formula below.

$$V=BD$$

Where V=beizer volume of the total face

B=mapping of the beizer curves and mesh nodes

D=matrix having control point displacement vectors in columns.

TEST CASE:

In the test case we took nearly 30 samples each sample is a frame from the video and these frames are used as a test to identify the initial facial gestures[7] of the student under monitoring. The data obtained from the test case is sent to the database for storage. The input frames for the test case is shown below[6].

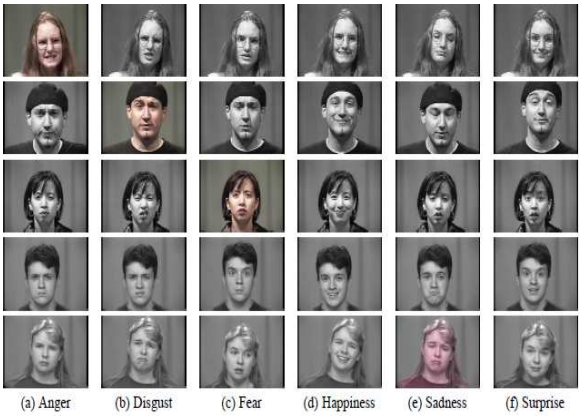


Fig4: Sample frames of different facial expressions.

TRAINING CASE:

The data of the input frames of the test case which is stored in the database is obtained or retrieved from the database in order to train the system easily by retrieving the already stored values from the database. The attention percentage of the student and also the mood of the student listening[10] to the video lecture is calculated from the experiments.

Subject	NB-Gaussian	NB-Cauchy	TAN
1	80.97%	81.69%	85.94%
2	87.09%	84.54%	89.39%
3	82.5%	83.05%	86.58%
4	77.18%	79.25%	82.84%
5	69.06%	71.74%	71.78%
Average	79.36%	80.05%	83.31%

The algorithm we used to calculate the attention percentage of the student were Gaussian and tan classifier algorithm.

CONCLUSION

Recent researches based on the attention level of the student say that a student can be able to listen to a lecture minimum 15-20 minutes. Since while taking a lecture, the staff can monitor the students and know whether a student is attentive in the class. When it comes to online, monitoring the student will be a lag point. To rectify this webcam monitoring system calculates the attention percentage of the student which will be helpful to organizations providing online courses to see whether a student is attentive while reading the documents as well as listening to the video.

REFERENCES

[1]. J. Ostermann, Face Animation in MPEG-4, pp. 17–56, Wiley Blackwell, **2002**.
[2]. R. Hartley and A. Zisserman, Multiple View Geometry in Computer Vision, Cambridge University Press, New York, NY, USA, 2 edition, **2003**.

[3]. R. Mazza and V. Dimitrova, "Coursevis: A graphical student monitoring tool for supporting instructors in web-based distance courses," International Journal of Human-Computer Studies, vol. 65, no. 2, pp. 125 – 139, **2007**.
[4]. M.A. Just and P. Carpenter, "Eye fixations and cognitive processes," Cognitive Psychology, vol.8, no. 4, pp. 441–480,**1976**.
[5]. Facial Expression Recognition from Video Sequences: Temporal and Static Modeling by Ira Cohen , Nicu Sebe , Larry Chen , Ashutosh Garg , Thomas S. Huang studied in Leiden Institute of Advanced Computer Science, Leiden University, The Netherlands.
[6]. Human Facial Expression Detection From Detected In captured Image Using Back Propagation Neural Network by Jahdish Lal Raheja, Umesh Kumar in International journal of computer science and information technology (IJCSIT), Vol.2, No.1, February **2010**.
[7]. www.mathworks.com/help/vision/examples/face-detection-and-tracking-using-camshift.html
[8]. www.mathworks.com/help/vision/examples/motion-based-multiple-object-tracking.html
[9]. www.mathworks.com/help/vision/examples.html
[10]. www.mathworks.com/help/vision/examples/face-detection-and-tracking-using-live-video-acquisition.html
[11]. www.mathworks.com/help/vision/feature-detection-extraction-and-matching.html
[12]. www.hindawi.com/journals/aurt/**2014**/816137/