

Student Live Behaviour Monitoring

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Abstract: *Due to the health emergency situation, which forced universities to stop using their centres as a means of teaching, many of them opted for virtual education. Affecting the learning process of students, which has predisposed many of them to become familiar with this new learning process, making the use of virtual platforms more common. Many educational centers have come to rely on digital tools such as: Discord, Google Meet, Microsoft Team, Skype and Zoom. The objective of the research is to report on the impact of student learning through the use of the aforementioned videoconferencing tools. Surveys were conducted with teachers and students who stated that 66% were not affected in their educational development. Most of them became familiar with the platforms; however, less than 24% qualified that their academic performance has improved, some teachers still have difficulties at a psychological level due to this new teaching modality. In conclusion, teachers and students agree that these tools are a great help for virtual classes. The primary objective of this project is to create a self-sufficient agent that can offer information to both teachers and pupils. The level of student involvement is directly related to important academic outcomes like critical thinking and the marks students get in a topic.*

Keywords: *Face Detection, Shape Predictor Model, Modules-Client, Server, Face Processing Module*

I. INTRODUCTION

Human behavior analysis is an important area of computer vision research dedicated to the detection, monitoring and

understanding human physical actions .

The teaching and learning cycle may be regarded to be the most critical operation in the academic institution. During classes,

attendance and student behavior are closely monitored alongside teaching activities. Information has demonstrated that student interest is a central element in participation and performance. Teachers will be able to track student activity and recognize relevant indicators to draw assumptions regarding the student's real involvement in learning experiences. However, people's behavior is unpredictable to most situations and monitoring is quite challenging specially for a big scenario. According to research, emotions profoundly influence leaning and achievement. These emotions can be positive or negative. There are four known academic emotions relevant for student learning: Achievement Emotions contribute to the tasks of accomplishment and the performance and loss of such practices; Epistemic emotions re the feelings caused by neurological challenges, such as the excitement of a new task; the interest, uncertainty and annoyance of obstacles; and the joy of overcoming the problem; Topic emotions which pertains to the issues discusses in the lessons; and Social emotions relates to teachers and colleagues in the school, such as affection, concern, compassion, respect, disdain, jealousy, rage or social anxiety. Such emotions are particularly relevant in teacher/student interaction and community learning. Attention is the emotional

mechanism of dwelling on one part of the world while overlooking others. "Pay attention!" is an expression repeated used by so many teachers all over the word to students. Paying attention is the first step in the learning process. The application of machine learning and computer vision methods have made tremendous progress over a decade and have been successfully employed in various applications such as automated assessment such as , security, image data investigation such as , general identity verification and surveillances such as . One example of automated assessment is applied in a classroom setup. One way to determine whether or not the student is conscientious in the classroom is by facial expressions. Facial expressions are facial changes in response to a person's internal mental states, thoughts, or social contact. Facial expression recognition refers to computer programs that seek to automatically interpret and identify facial expressions and facial changes in visual detail. For automated classroom evaluation, interaction may be split into two categories: single-person and classroom-based study. In a single-person study, facial gestures can include feedback on current neural functions and can be evaluated when observing action unit characteristics. In a classroom-based study, the emphasis changes from single individuals to common features and experiences between

participants. Monitoring student behavior is important to allow teachers to easily identify and correct improper behavior. By tracking student actions, schools may assist students in achieving behavioral targets, help consider student own conduct and effect on others, and eventually empower student to identify and implement habits that are important for school performance. In this paper, single-person analysis was used in detecting the face of each student to determine the student behavior. An experimental setup was installed for data collection. The researchers aim to present a new approach of predicting student behavior (attentive or not attentive) based from face recognition during class session. This demonstrates a real-time detection of student behavior.

Mortal geste analysis is a major and important aspect of computer-assisted visual analysis devoted to the acquisition, coverage and understanding of mortal geste and its physical behavior. The teaching and learning process can be considered as the most important activity in theological institutions and colleges. During classes, student and gesture attendance is likely to be covered by the school teacher and the teaching environment. Experts will be qualified to track the work of academics and geste during classes. However, pupil geste is

highly variable and vigilance is really weak, especially considering the larger situation. According to experiments, emotions have a profound effect on the learning process and success. These desires can have either a positive or a negative effect. There are four common passions that apply to students' learning (1) Feelings of Success have an impact on the ability to negotiate performance and the loss of similar habits; (2) Sickness is a feeling caused by emotional challenges, such as the joys of a new job; interest, question and resentment of obstacles; and the joy of kneeling in difficulty; (3) Subject interests related to the purposes covered in the allocations; and (4) Public interest is related to teachers and schoolmates, such as love, concern, compassion, respect, contempt, greed, anger or public concern. The same sentiments are strongly associated with teacher / student marketing and teaching literacy in the community. Attention is a way of feeling in one part of the world while looking at others. "Hear!" Is a term often used by many teachers around the world to refer to experts. In the learning process, attention is a basic skill.

MOTIVATION

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- Achievement Emotions contribute to the tasks of accomplishment and the performance and loss of such practices Such emotions are particularly relevant in teacher/student interaction and community learning. Attention is the emotional mechanism of dwelling on one part of the world while overlooking others. “Pay attention!” is an expression repeated used by so many teachers all over the word to students. Paying attention is the first step in the learning process.
- In this project, we used in detecting the face of each student to determine the student behavior. An experimental setup was installed for data collection.

II. LITERATURE SURVEY

Currently, in times of pandemic, teaching is at a distance where the use of different means of videoconferencing is relevant in

education. Since, it has a very significant role in the learning experience of the students. The author, indicates that ICT has contributed to the new educational reforms. Google meet was mostly used by students in work meetings as opposed to teachers who preferred to zoom in on class meetings.

Presently, in instances of epidemic, teaching takes place over long distances, necessitating the employment of various forms of conferencing in schooling. Because it plays such an important part in students' learning experiences. According to the authors , ICT has aided in the implementation of new education policies. Children are more likely to use Google Meet in work meetings than instructors, who prefer to zoom in on classroom sessions.

Many researchers have given their opinions on behaviours that affect student performance. Various Vietnamese scholars, FPT University have said that automatic learning statistics have become an important topic in the field of study, requiring effective programs to monitor students' behaviour, their learning process and provide feedback to teachers. Arnold L. Glass and Mengxue Kang said Separating Attention in Class Reduces Student Test Performance. Because these students are distracted by watching videos,

playing games, or sending messages as actors they take study notes on digital machines. they simply divert attention from other unnecessary things that may have a profound effect on their academic conduct. Face Recognition (FR) is known as a new research center due to the many different applications in different fields of trade and legal fields. Face identification is a very important aspect of face detection. Face recognition algorithm is used to identify a person's face in photo or video data using digital cameras for diagnostic purposes. In the case of class tests, this will help mark student direct engagement and student behaviour analysis. There are many face recognition algorithms to extract facial expressions. There are also other algorithms with templates such as Viola and Jones, which include three main concepts: the main image, the reading of sections by AdaBoost, and the cascade attention structure and Integral Image, also known as the abbreviated local table. B. YOLOv3 model. The YOLO algorithm is a standard single algorithm for single phase target acquisition that combines problem-solving and targeted retrieval problems with an anchor box, achieving high efficiency, flexibility and normal results. This is very popular in the field of engineering because of the Darknet spinal network that can be replaced by many other structures. To monitor students'

actions / behaviour, two possible approaches, namely, assessment and questions, can be done. However, these two methods are useless, and they do not have sound judgment, because people may forget what they did. With the growth of the field of computer vision, the task of assessing and analyzing student behaviour in the classroom in real time is not an impossibility right now. H.K. Ning and K. Downing believed that a large part of student behaviour, including study skills, study attitude, and motivation, had a strong connection with student learning outcomes. Students' perceptions of the teaching and learning environment influence their behaviour and academic performance.

III. PROPOSED SYSTEM

In proposed system artificial intelligent is used to predict behavior of student in online classes when student is live. Student features are captured from every frame and data is analyzed based on different types of activity related to eye movement, mouth movements, head movements and analysis is done on student active status on that respective class. Graphical representation is used to show performance of student.

SYSTEM DESIGN

The System Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts, human-machine interfaces, detailed design, processing logic, and external interfaces

IMPLEMENTATION

. **Client:** This application is run by student where camera will open and students' video is displayed on screen. Details of each frame are shared is sent to other modules for processing and analysing with trained model. Result is shown in graph after analysis.

Server Module:

This module is executed to track details of student and analyze actual performance. Each frame is sent to face processing module for checking with trained model. Server Module is used to process data between client and face processing module.

Face Processing Module:

This module each frame is taken as input and shape predictor model is used to predict various aspects of features like (eye aspect ratio, mouth aspect ratio, drowsy, yawn, head pose. After calculating these values are sent to server module.

SYSTEM ARCHITECTURE

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system. Organized in a way that supports reasoning about the structures and behaviors of the system.

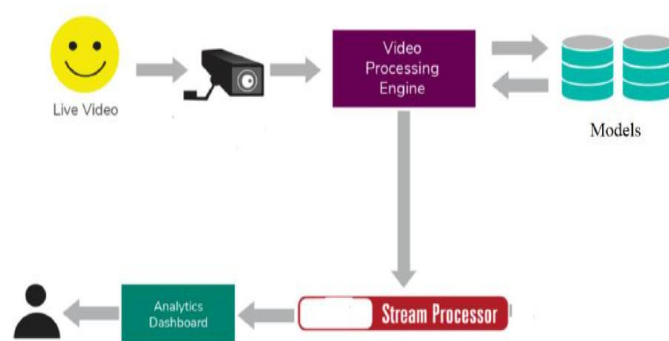


Fig.1 System architecture

3-Tier Architecture:

The three-tier software architecture (a three-layer architecture) emerged in the 1990s to overcome the limitations of the two-tier architecture. The third tier (middle tier server) is between the user interface (client) and the data management (server) components. This middle tier provides process management where business logic and rules are executed and can accommodate hundreds of users (as compared to only 100 users with the two tier architecture) by providing functions such as queuing, application execution, and database staging.

The three-tier architecture is used when an effective distributed client/server design is needed that provides (when compared to the two tier) increased performance, flexibility, maintainability, reusability, and scalability, while hiding the complexity of

distributed processing from the user. These characteristics have made three-layer architectures a popular choice for Internet applications and net-centric information systems.

IV. RESULTS

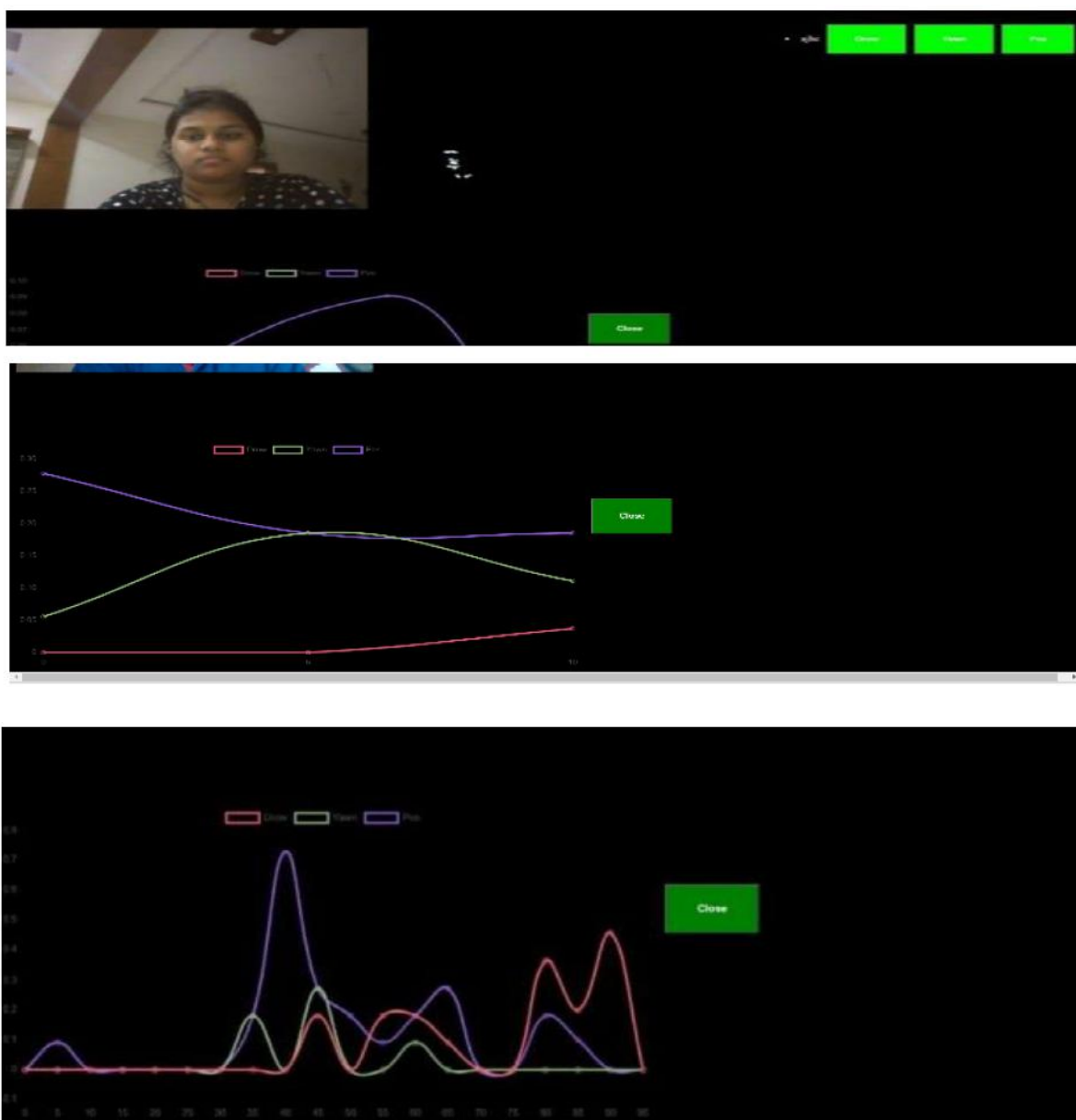


Fig.2 Graphical Representation for Drowsiness, Yawn, Head Pose

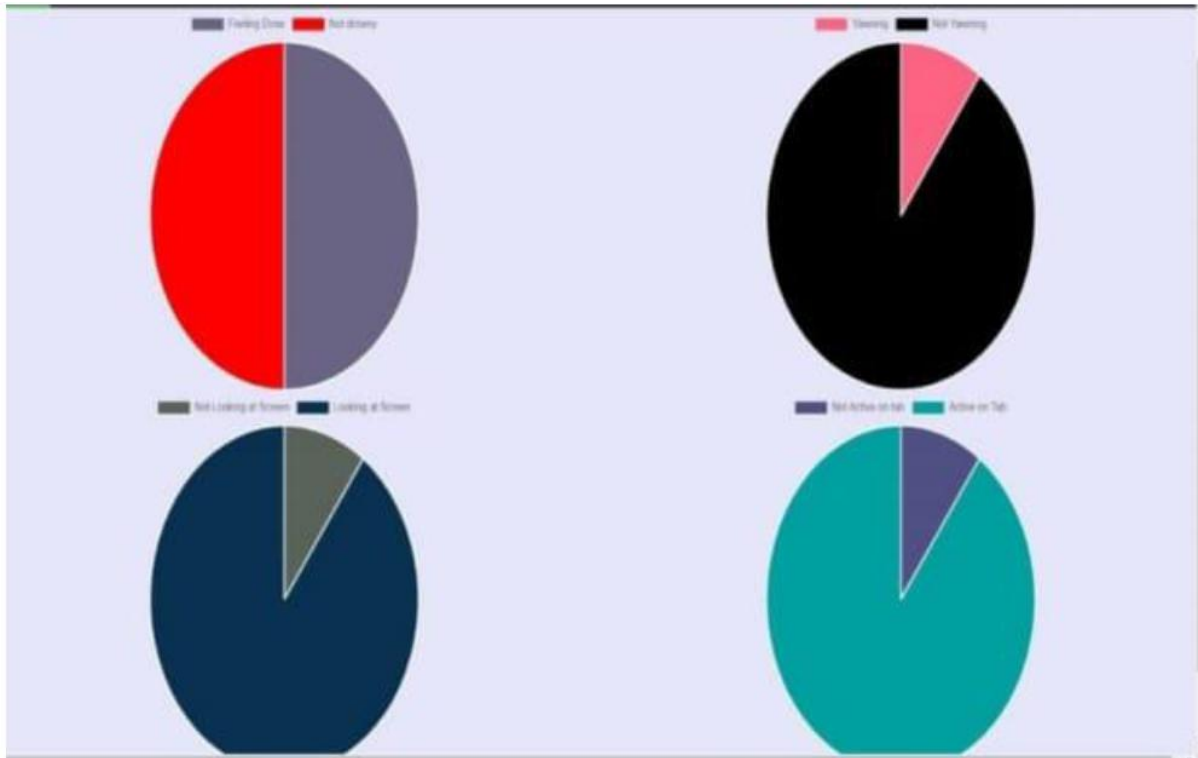


Fig.3 Overall performance of Students.

V. CONCLUSION

This research aimed to build a system that automatically supports teachers and related educational faculties with monitoring student behaviour. We focused on the observation targets of the students across time. The system works as an assistant for the decision-making process. The strategic information maybe discovered and delivered to the decision-makers automatically. Previous works have not taken advantage of deep learning for statistical analysis or have only applied old computer vision models. We successfully applied the most recent, state-of-art models. Furthermore, we applied shape predictor

module and face landmark module. We have seen the behaviour of the student was predicted using the head position, drowsy, eye movement and yawning of the student. This project can be added as an add-on feature to the live steaming platform for the predictive analysis of the student.

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