STUDENT EVALUATION USING FACE EMOTION RECOGNITION

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ABSTRACT

Student Evaluation Using Face Emotion Recognition" is introduced in this system. Many students in the institute do not mentally attend lectures, and as a result, they do not grasp the concepts of the lecture. For this implementation, OpenCV technology and the Convolution Neural Network (CNN) Machine Learning Algorithm is used. This framework is built on deep learning technology, which can greatly improve teaching and learning interactivity. To get the picture frame sequence, first separate the video stream. Then, after extracting the valid data with the classroom analysis module, mark the face section with the Mask CNN model. And the eigenvalue of the face is obtained through the Exception framework. The Haar cascade is then used to analyze the students' facial expressions. It also prevents recognition of lectures caused by lack office representation. Using this system the teachers can grasp the classroom atmosphere in real time, to facilitate the adjustment of the teaching strategy in time. The outcomes of empirical experiments indicate that the proposed method performs well. In addition, the method increases teaching efficiency, allowing students to have a much more positive learning experience and satisfaction. Students who respond quickly to questions about their comprehension during a lecture will learn more quickly.

Keyword: *- Machine Learning, Image Processing, Feature Extraction, Segmentation.*

1. INTRODUCTION

Students behave mysteriously in their classrooms. Although course developers, instructional designers, and instructors spend lots of time to develop educational artifacts in the classroom, students don't use these contents as the developers designed.

In the previous research, some patterns in student's activities in classroom were found. Students in education start to develop their study habits in their early classes. Although both of them do the same classroom activities, some are doing well while others are not. The differences in their study habits make their differences in academic performances.

Academic institutions have been trying to understand why some students are successful and others are not. Researches focus on the different profiles of the students. The argument is that there is a missing piece of information in this profiling model. The profiling approaches focused on the factors that cannot be changed.

Control of machines and their process with various technologies based on computer software is called automation. In this modern age, these advancements have proven to increase accuracy and also help to improve the livelihood. Innovations such as these save lots of labor work. One advancement in the field of automation is the automated student behavior system which replacing old and traditional lecture evaluation. These types of systems are heavily based on computer vision and machine learning algorithms.

In case of the present system the lectures are going regularly but main reason behind this 10-20% students get 80% knowledge, 20-60% students get 60% knowledge and remaining students had do not clear their concepts. Hence the limitations are motivated for this idea. Then the system was proposed ―Student Evolution using face emotion recognition.

Each face recognition will be described by a set of patterns containing information about everyday purchase class satisfaction, the time since, focus was on collecting face images for predicting the symptoms of effects of lectures based on two-feature face representation and face expression, among other things. The conclusion is that both representation and expressions visible are essential for improving lecture evaluations in general. Here OpenCV technology and Convolution Neural Network (CNN) Machine Learning Algorithm can be used for this implementation of system.

1.1 Convolutional Neural Network (CNN)

A convolution neural network has multiple hidden layers that help in extracting information from an image. The four important layers in CNN are:

- Convolution layer - ReLU layer
- Pooling layer
- Flattening
- Fully connected layer

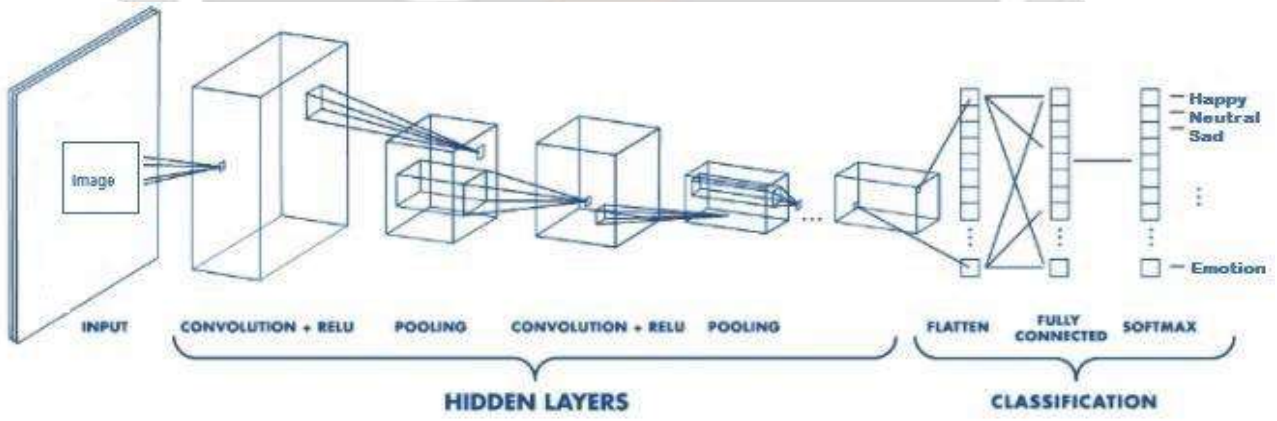

Fig: CNN Layers

The Convolutional Neural Network (CNN) is a class of deep neural network. CNN has one or more convolutional layers and used mainly for image processing, classification, Segmentation. Convolution is the process of sliding a filter over an input. Haar cascade is used for face detection because of their robustness. It is robust against monotonic gray scale transformations. This system provides functionalities such as taking images of students, training the images in the database. When students enter the classroom, this system detects the faces of students who are entering the classroom from the camera and pre-processed for further processing. Here the input is live video camera through that face of the student is detected.

When the lecture is start the face is recognize and identify the expression of the student. If student is understood, confused or not understood. For identify the expression of the student pre-processing, segmentation, feature

extraction and classification is done. Here the dataset is created which contain the feature of expression like happy, sad etc. The model is trained using the dataset which is collected manually using camera. Graphical User Interface (GUI) for this system created using python module. Tkinter is the fastest and easiest way to create a GUI application.

2. RELATED WORK

[1] Refik Samet el at, discussed A face recognition-based mobile automatic classroom attendance management system has been proposed with a face recognition infrastructure allowing the use of smart mobile devices. In the proposed system, RESTful web services were used for communication among teacher, student, and parent applications and the cloud server. Attendance results are stored in a database and accessible by the teacher, student and parent mobile applications. The proposed system eliminates the cost for extra equipment, minimizes attendance-taking time, and allows users to access the data anytime and anywhere. Smart devices are very user-friendly to perform classroom attendance monitoring. Teachers, students, and parents can use the application without any restrictions and in real-time. The most important limitation of tested attendance monitoring process is decreased success with increasing distance between the camera and students. The results regarding students sitting in front seats are more accurate in comparison to results regarding students sitting in the back. Secondly, the accuracy rates may have decreased due to the blurring caused by vibration while the photo was taken. Thirdly, in some cases one part of the student's face may be covered by another student sitting in front of him/her, which may hamper a successful face recognition process.

[2] Marko Arsenovic el at, In this paper, the development of deep convolutional neural networks (CNNs) for face detection and recognition tasks, a new deep learning-based face recognition attendance system is proposed in this paper a new deep learning-based face recognition attendance system is proposed. The entire procedure of developing a face recognition component by combining state-of-the-art methods and advances in deep learning is described. It is determined that with the smaller number of face images along with the proposed method of augmentation high accuracy can be achieved. Poor network traffic or some other technical problems could potentially bring noise to the data. Using these augmented images in the dataset could adopt DNN for partially noised data. For this part of augmentation, a Python script was written using OpenCV interface to automatically generate new augmented images out of the original ones. A new approach of augmenting the images for deep learning faces recognition tasks. This task used the Dlib, machine learning toolkit for marking the location of a person's nose, eyes, chin and mouth on the image. Knowing the actual positions of these parts of a face on the image, the Python script automatically adds random accessories: moustache's, glasses, etc. and creates new images for training dataset. A Python script was used to automatically detect the face.

[3] Bharat Tej Chinimilli el at, proposed an Face Recognition based Attendance System using Haar Cascade and Local binary Pattern Histogram Algorithm. It is robust against monotonic grayscale transformations. Graphical User Interface (GUI) for this system created using python module. Tkinter is the fastest and easiest way to create a GUI application. This system provides functionalities such as taking images of students, training the images in the database and on the camera and start tracking people entering the class. When students enter the classroom, this system detects the faces of students who are entering the classroom from the camera and pre-processed for further processing. To detect the faces the system used a haar cascade classifier which is proposed in where a cascade function is trained and detect features in other images. For this, system use haar features like edge, line, and four-rectangle. For a large image or variable size of an image, it takes a lot of computations and features and most of them will be irrelevant. But AdaBoost manages to select the best out of many. Then Region of Interest (ROI) i.e., containing faces is extracted and sent to next stage. For face recognition, the system decided to use the LBPH algorithm because of its robustness, the capability to recognize both front and side faces and better. The LBPH algorithm is used as they find characteristics that best describe a face in an image. Here the problem is the dataset is small.

[4] Bana Handaga el at, discuss the prototype system for managing student attendance in classroom based on deep learning facial recognition technology without queue. Feature extraction uses 128-d facial embedding's from Face Net, and code implementation uses libraries originating from OpenCV and dlib. The installation of the device is done in such a way that it allows the process of identifying the faces of students present in the classroom can be

done during the learning session in the class is still ongoing. The results show that this system is able to detect the presence of students in the classroom well.

3. PROPOSED APPROACHES

The proposed system classifies students face expressions in the classroom during lectures using supervised machine learning techniques. In this project, creation of framework that provides precise student feedback for each lecture, allows to assess how successful that lecture was. The three forms of neural networks are familiar; each one has a unique approach to solving problems.

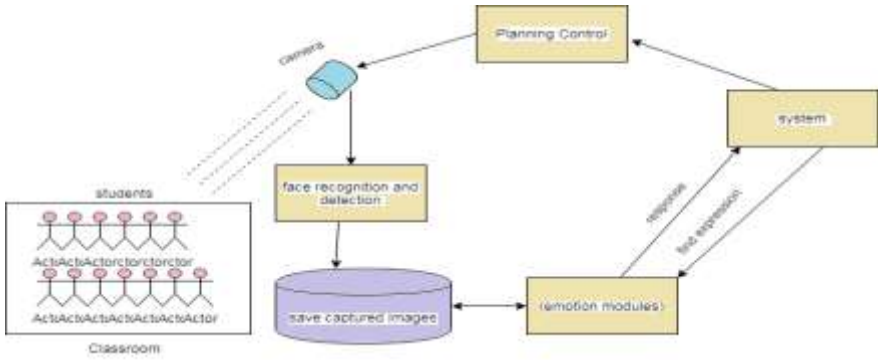

Fig: System Architecture

The most critical step in image analysis is feature extraction. It's a concourse mechanism that separates data from the image itself from an entity or group of objects. The proposed study assembles an image data set for predicting facial emotions. The image capture symptoms prediction is composed main component including the digital camera tor capturing the image of students face representations. In order to understand and predict the effects of improved lecture assessment on correct image capture symptoms. In above figure i.e., System architecture represents the face expression recognition of students. The camera could be seen which is capture the video of students then take some snapshots and store it in database then the captured expression can be found by the system. Convolutional neural networks (CNN), recurrent neural networks (RNN), artificial neural networks (ANN), and other forms of neural networks in machine learning change the way to communicate with the world. These types of neural networks are at the core of the machine learning revolution, powering applications like unmanned aerial vehicles, self-driving cars, speech recognition, etc. The System is based on CNN i.e., convolutional neural network because, CNN is considered to be more powerful than RNN and ANN. Facial recognition, text digitization and natural language processing this ate the applications of CNN. The key advantage of this approach is its high precision in image recognition problems.

4. CONCLUSION

The art of understanding how various students comprehend educational content after a class lecture is explored in this article. This module is used to see if it is possible to observe and analyse student behaviour in the classroom. And, if class, detect the most faces with greater accuracy. OpenCV Python is a library for dealing with computer vision issues.

5. REFERENCES

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