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Random Intervel Query and Face Recognition Attendance System for Virtual Classroom using Deep learning with AI

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***Abstract* – In today's competitive world ,most of the learning process take place in virtual mode due to the phenomenoal circumstances like COVID-19.The online learning makes the teachers and students in virtual classroom as an alternative for the one-on-one learning in physical classrooms.Instead of focusing on learning ,lectures are stuck with taking and maintaining the attendance record for the individual student in manual mode during the virtual classroom as it consumes the classroom time.It's hard to keep students engaged without a teacher's physical presence and face-to-face contact.In this paper ,we introduce the 'Random Interval Query and Face Recognition Attendance System for Virtual Classroom using Deep Learning with AI',which is an innovative solution for attendance monitoring issues during virtual learning.Here the attendance monitoring is done through face recognition with the help of AI.The algorithm used here is Deep Neural Network (DNN) learns and captures the unique features from each student 's face input.It collects the faces of student's in the classroom and matches with the exact face of the student with the database that are stored in the server.However, it takes the accurate attendance of the student day by day and stores in server so that teachers can monitor and maintain their attendance properly.**

***Keywords* – Attendance system, Deep learning, Neural network, Face recognition.**

I. INTRODUCTION

A virtual schoolroom is a web teaching and learning atmosphere wherever lecturers and students will gift course materials, have {interaction} and interact with alternative members of the virtual category, and add teams along. The key distinction of a virtual schoolroom is that it takes place in a very live, synchronous setting. on-line work will involve the viewing of pre-recorded, asynchronous material, however virtual schoolroom settings involve live interaction between instructors and participants.

Virtual lecture rooms and distance learning, as alternate technology-driven learning ways, are growing at an inexpensive pace. Virtual lecture rooms are specifically in use by all sectors, as well as primary and better education furthermore as company learning. The increasing quality of social and microlearning methods, fostered by general social media platforms like YouTube and Twitter, and major academic technology disruptions like edX, have accessorial to the increasing acceptance of virtual modes of learning. it's expected that the predominant use of virtual lecture rooms would increase by a thumping sixteen.2% combined annual rate of growth by 2023. still, virtual lecture rooms haven't nevertheless been thought of as a heavy different or substitute for the modern face-to-face (F2F) learning.Things have began to look totally different, however, within the wake of this, novel coronavirus COVID-19 pandemic, since the complete world is beneath internment. it's the time of the year once tutorial and teaching activities square measure fully swing in most elements of the planet. this pandemic state of affairs has sealed the method for a ground check of virtual lecture rooms as a distinguished tool of learning within the current times.

Schools, colleges, universities, corporates, and even world bodies and tripartite organizations just like the UNO, WHO, and G20 have had to change to the lesser-used virtual mode of learning and communications. These emerging circumstances stand as a contributory check for corporations providing virtual schoolroom platforms and services like sheet, Desire2Learn, Cisco, Microsoft, etc. The check parameters square measure varied, some predominant ones being information measure management, network traffic, server time interval, and variety of simultaneous users.

II. PROPOSED SYSTEM

1. Overview

The proposed framework for students engagement detection in online learning, The main purpose of this project is to detect face recognition-based automated

student attendance systems. It is used to achieve better performance.The test images and training images have to be captured by using the samedevice there is no quality difference. Then, the students database are registerd to be recognized.The completed output may be the attendance marked of an individual person, if the captured pictures exists in the trained dataset of pictures, if the captured picture does not exist the trained database then an unknown person is present in the class or a person from diffrent class may also go to the elegance at some stage in the time of picture capturing.

The device has been carried out in a computer pc with an integrated internet digital digicam. Let's recollect the undertaking of checking attendance for a class. To put together for the attendance test, all college students inside the class are required to take photographs through the integrated internet digital digicam. These photographs are used to generate the pupil face database as a reference for real-time face popularity. To test the attendance of a pupil for the class, the pc takes face photographs of the pupil thru the real-time video move and employs deep gaining knowledge of neural networks to expect whether or not the pupil fits everyone withinside the database, and further identifies the call of the pupil.

1.Face recognition

Face reputation is an era that identifies someone and validates it through the evaluation of the face capabilities formerly saved in a database. The underlying technologies withinside the face reputation approach are primarily based totally on synthetic intelligence and system mastering. There are major strategies offered withinside the literature for face reputation.

The first technique is predicated on the facial expressions of the eyes and nostrils to apprehend the face. The 2d technique makes use of the complete face of someone for identification.'Face detection is the primary project performed, whilst processing pictures that can incorporate human faces. The face detection effects are used for the next steps of computerized human face reputation. Convolutional Neural Networks (CNNs) era have extensively progressed the overall performance of face reputation structures in latest years.

The excessive potential of CNN in mastering discriminative face capabilities has reformed face reputation techniques. In RIAMS we followed CNN's primarily based totally version for the layout of its face reputation module. Further, we determined to hire the Dlib ResNet-34 version, which makes use of HOG capabilities for face reputation. The primary motivation for deciding on Dlib ResNet-34 turned into its better accuracy in comparison to different present face reputation fashions. Accuracy is one of the broadly used metrics for comparing the overall performance of sample-type fashions and consequently face reputation.

III.OBJECTIVE

The key objective of AIPresent is to develop a robust system that monitor students' attendance and engagement in a virtual classroom, at random intervals of time. It encompasses a novel design using the AI Deep CNN (Convolution Neural Network) model to capture face biometric randomly from students' video stream and record their attendance automatically. Thus, the main componentof the proposed model is a face recognition module built using the AI-DL tools. RIAMS also incorporates ancillary submodules for assessing students' responses to CAPTCHAs and UIN queries, to ensure active engagement in virtual classrooms.

IV. FIGURES AND TABLES

CNNs are a class of Neural Networks which have demonstrated very powerful in regions which include photo popularity and classification. CNNs are a sort of feed-ahead neural networks made of many layers. CNNs encompass filters or kernels or neurons which have learnable weights or parameters and biases. Each clear out out takes a few inputs, plays convolution and optionally follows it with a non-linearity. A regular CNN structure may be visible as proven in Fig.1. The shape of CNN carries Convolutional, pooling, Rectified Linear Unit (ReLU), and Fully Connected layers.

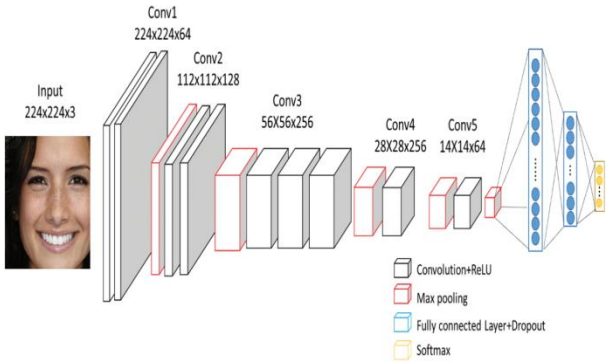

Figure 1: DCNN Layers

Face popularity may be appeared as a hit if as a minimum one of the 5 schooling samples fits with the take a look at sample. Thus, if the take a look at pix extracted from the video frames of the digital magnificence are matching with the schooling samples, attendance from the face popularity module is recorded. A comparative assessment primarily based totally at the accuracy of the proposed face popularity Deep Convolutional Neural Network (DCNN) system, as compared to Support Vector Machine (SVM), Linear Discriminant Analysis (LDA), Principal Component Analysis (PCA), as statistical approach, Multi-Layer Perceptron (MLP), Combined Radial Basis Function

(CRBF), as neural community approach.The outcomes display that the proposed DCNN achieves better accuracy as compared to different approaches.

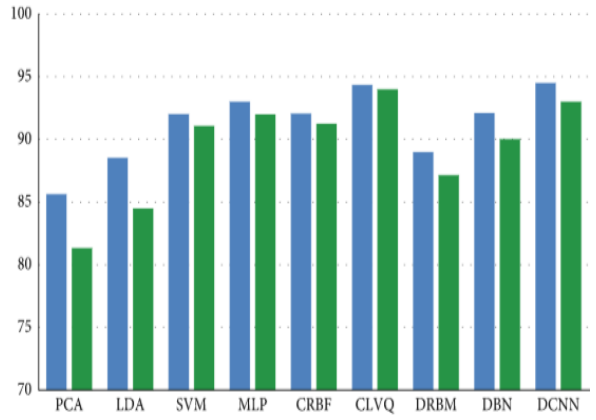

Figure 2 Accuracy of Face recognition

V.CONCLUSION

The Random Interval Query and Face Recognition Attendance System for virtual classroom using Deep Learning with AI is based on novel and innovative design that resolves the unavailability of a proper attendance management system for virtual learning.In this paper, a Deep Learning method with AI is used for the face recoginition to monitor and maintain the student's attendance.Thus the attendance of the students present in the virtual class is marked by face recognition which is with implied with Deep Neural Networks (DNN).It saves the time and energy in the aspect of taking attendance and also it avoids the fail proof of the attendance system.Also , this system can also be used to identify the unknown person whether he/she related to institute or not.

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