



FACE DETECTION BASED ATTENDANCE SYSTEM USING CNN BASED TEMPERATURE MONITORING

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Abstract : The face serves as a person's unique identifier. Over time, there have been significant advancements in exploiting this physical feature through image processing techniques. Attendance tracking is a common practice in schools, colleges, and libraries. The conventional method for attendance involves the professor calling out student names and recording attendance manually. However, with the advent of machine learning techniques, computer vision applications have been significantly explored. This project aims to utilize machine learning concepts in face recognition for automatic attendance systems. The face detection and recognition algorithms are used to provide computer systems with the ability to quickly and accurately identify human faces in images or videos, enabling the systems to take attendance automatically. Moreover, the system incorporates temperature measurement using an mlx90614 infrared temperature sensor along with face detection. This project holds significant potential in improving attendance tracking and promoting efficiency in various academic and non-academic institutions.

Keywords : Attendance system, Face detection, Temperature monitoring, CNN

I. INTRODUCTION

These days, technology aims to impart a wealth of knowledge-based technological innovations. One of the fascinating subfields is deep learning, which employs a variety of learning algorithms to provide an appropriate output during testing and enables a machine to train itself by providing a number of datasets as input. These days Participation is considered as

a significant variable for both the understudy as well as the instructor of an instructive association. The machine now automatically detects students' attendance records and stores the collected data thanks to advances in deep learning technology. By and large, the participation arrangement of the understudy can be kept up with in two unique structures specifically,

- Manual Attendance System (MAS) A manual student attendance management system requires a subject-specific teacher to manually call each student's name and record their attendance. Manual participation might be considered as a tedious interaction or in some cases it occurs for the educator to miss somebody or understudies might answer on different occasions on the shortfall of their companions. Thus, the issue emerges when we contemplate the conventional course of gauging participation in the study hall. The Automatic Attendance System (AAS) is our choice to address all of these issues.

The Automated Attendance System (AAS) uses face recognition technology to automatically estimate a student's presence or absence in the classroom. It is also possible to determine whether a student is awake or asleep during the lecture, and it can be used during exam sessions to guarantee the student's presence. The presence of the understudies not set in stone by catching their faces on to a superior quality screen video web-based feature, so it turns out to be exceptionally dependable for the machine to grasp the presence of the multitude of understudies in the homeroom. The two most common approaches to human face recognition are the Feature-based approach and the Brightness-based approach. The Feature-based approach, also known as the local face recognition system, is used to point out key facial features like the eyes, ears, nose, mouth,

and edges. whereas the brightness-based method, which is also known as the global face recognition system, is used to identify all of the image's components. • Automated Attendance System (AAS).

II. LITERATURE SURVEY

Gang Jin and co. 2015) The safety inspections at the subway, airport, and railway all place an increasing emphasis on the identification of presented liquids. The best method for liquid security identification is non-contact identification because it can prevent liquid contamination and injuries from corrosive and toxic liquids. Based on the sensor of the MLX90614 and the most popular microprocessor for the non-contact liquid security identification system, the paper developed the non-contact Infra-Red thermometer. fabricated the PCB plate, completed the hardware circuit, programmed the software using Keil C, and debugged using Keil uVision4 MDK V4.22. Then, we examined the effects by measuring temperature differences at various distances using bottles of various shapes, materials, sizes, and wall thicknesses. Real-time response, low power consumption, high reliability, and the requirements of the non-contact liquid security identification system are all met by the system. Piyush Devikar (2017) proposed face liveness and camouflage identification framework kills the possibilities of an individual to counterfeit his/her character. Fake faces created with high-end silicone masks and prosthetics are not detected by the face recognition systems that are currently on the market. Additionally, these systems mistake a photograph of a face for a real one. These are the flaws in the systems that are available. This paper presents a basic way to deal with tackle the glaring weaknesses that are available in practically all face acknowledgment frameworks. This framework chips away at the rule that the surface temperatures of veils are near encompassing temperatures, dissimilar to genuine countenances whose temperatures are higher than surrounding ones. This system takes a picture with the Raspberry Pi's webcam and processes it with OpenCV to find the face in the picture. Using an IR temperature sensor, the camera determines the face's temperature. Assuming the face is recognized in the picture and its temperature is more than the limit

esteem (skin temperature) then face is truly in any case, it is phony.

M. Krito and coworkers 2018) argued that as the use of surveillance systems increases, so does the need for improved security measures, particularly at night and in low-light conditions. A security system's goal is to collect as many details as possible to improve person recognition. The strengths and weaknesses of various representative thermal face recognition methods will be highlighted in this paper. The use of convolutional neural networks and the fusion of visible and thermal images are two examples of recent developments in security and surveillance systems. Likewise, existing difficulties of warm facial acknowledgment and its applications in a genuine will be brought up. M. Kasiselvanathan and coworkers 2018), Facial Recognition is a biometrics technology that has been used in a variety of applications, including security systems, human-machine interaction, and image processing methods. The primary objective of this paper is to simplify the calculation of student attendance. We proposed an automated attendance management system that provides faculty with a face recognition solution and eases the burden of attendance collection. The system that used facial dimensions to automatically calculate attendance. A face recognition-based efficient attendance system has been developed for both secure attendance and system efficiency. Eigen Faces is the algorithm that this system employs. Under a variety of conditions, the system is not only detecting faces but also the distance between facial characters. The proposed framework gives the achievement rate at face acknowledgment is around 93% to 95% and face recognizable proof is almost 100% and gives improved outcome than the current techniques.

Venkata Kalyan Polamarasetty et al. (2018) introduced Day to day participation stamping is a typical and significant movement in schools and universities for really looking at the exhibition of understudies. Maintaining attendance manually is challenging, particularly when dealing with a large number of students. Cost, accuracy, fake attendance, and intrusiveness are some of the drawbacks of some automated systems created to address these issues. To conquer these downsides, there is need of shrewd and computerized participation framework. Customary face

acknowledgment frameworks utilize strategies to distinguish a face from the given information yet the outcomes are not normally exact and exact as wanted. The generation of a facial model, a novel approach to identifying a student using a face recognition system, is the goal of the system described here, which aims to depart from such conventional methods. The face recognition system that will be used as an Automated Attendance System in a classroom is described in this way.

Gonçalo Marques et al. (2019), laboratory and teaching activities that have been suggested should be made available and backed by quality data. The warm solace of the understudies should be guaranteed in educating exercises. Data collection must be stored to ensure the stability of the environment when the test is conducted and at the time of data collection, as they influence the quality of the results, and several parameters must be ensured and monitored during laboratory activities. Frequently, there is the necessity of following item temperatures with noncontact yet in addition to gauge the surrounding temperature for correlation. Non-contact temperature measurements are made quickly and precisely using infrared temperature sensors. This paper presents a Web of Things (IoT) answer for ongoing temperature management named iRT. A hardware prototype for temperature data collection and Web compatibility for data access make up the solution. The iRT uses an infrared thermometer sensor module with an MLX90614 to monitor the temperature of objects and the surrounding environment in real time. The temperature history can be accessed through the Web application, as can the data that was collected. The obtained results are encouraging and make a significant contribution to IOT-based infrared temperature monitoring systems.

III. METHODOLOGY

The proposed system's function is to record each student's face and store it in a database for attendance purposes. The student's face must be captured in a way that allows for the identification of every facial feature. The system records a video, the face is recognized, and the attendance database is updated, eliminating the need for the teacher to manually take attendance in the classroom. This framework is created utilizing python opencv.

OpenCV: The real-time computer vision library known as OpenCV (Open Source Computer Vision Library) is a collection of programming functions. It was initially developed by Intel and supported by Willow Garage and Itseez (which Intel later bought). The open-source BSD license allows for free use of the cross-platform library. Garbage collection and dynamic typing are features of Python. It works with object-oriented, functional, structured (especially procedural), and other programming paradigms. Due to its extensive standard library, Python is frequently referred to as a "batteries included" language. Image Capture: We really want a HD camera to obtain results. We can catch the pictures from the video transfer or by catching every single picture from the webcam physically. We can get results faster by doing frame capture from a stream of video, but we won't be able to properly capture the face if we lose light or something else, or if the face is not captured properly.

Picture Handling: Advanced picture handling is the utilization of a computerized PC to deal with advanced pictures through a calculation. Digital image processing is a subfield of digital signal processing with numerous advantages over analog image processing. It prevents issues like noise and distortion buildup during processing and makes it possible to apply a much wider range of algorithms to the input data. Digital image processing can be represented as multidimensional systems because images can be defined in more than two dimensions. There are three main influences on the creation and development of digital image processing: first, computer technology's development; second, the growth of mathematics, particularly the development of discrete mathematics theory; Thirdly, there has been an increase in the need for a wide range of applications in industries, agriculture, the military, the environment, and medical science.

Neural Convolutional Network: A class of deep neural networks known as convolutional neural networks (CNN, or ConvNet) is used in deep learning to analyze visual imagery. Due to their shared-weights architecture and translation invariance, they are also referred to as shift invariant or space invariant artificial neural networks (SIANN). Image and video recognition, recommender systems, image classification, medical image analysis, natural language processing, and financial time series

are just a few of the fields in which they can be used. Multilayer perceptrons are regularized versions of CNNs. In most cases, multilayer perceptrons refer to fully connected networks, in which each neuron in one layer is connected to every neuron in the next layer. These networks are prone to overfitting data due to their "fully connectedness." Adding some kind of magnitude measurement of weights to the loss function is one common method of regularization. CNNs approach regularization in a different way: They use the data's hierarchical pattern to create more intricate patterns out of smaller, simpler ones. CNNs are therefore at the lower end of the connectedness and complexity scale.

IV. CONCLUSION

Catching the pictures from camera or cc camera and applying methods face location and acknowledgment can diminish the manual work from human and increment the security wellbeing, taking the choice from this acknowledgment result. Face detection and recognition can be used in a variety of applications based on this, including automatic attendance systems based on face recognition, worker attendance systems, security and safety applications, and police applications like finding a thief in an image that aid in their capture. In this framework we have carried out a participation framework for a talk, segment or research center by which teacher or showing colleague a record understudy's participation. When there are a lot of students in a lecture, it saves time and effort. This participation framework shows the utilization of facial acknowledgment methods with the end goal of understudy participation and for the further cycle this record of understudy can be utilized in test related issues. An infrared thermometer is a sensor that uses a lens to focus infrared (IR) energy on a detector. The detector then converts the IR energy into an electrical signal that can be displayed in units of temperature after being adjusted for changes in the surrounding temperature.

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