

A REVIEW PAPER ON FACE RECOGNITION & ATTENDANCE USING AI THROUGH PYTHON

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Abstract— *The identification of individualities has long been a fascinating issue for study and business. Facial recognition has come decreasingly popular in recent times as artificial intelligence has grown fleetly. Face recognition has a variety of benefits, including non-contact, high concurrency, and stoner- benevolence, in comparison to further conventional systems of card, point, and iris identification. Governance, public spaces, security, e-commerce, retail, and education are just a many of the numerous diligence in which it might find use.*

One of the most recent and pivotal machine learning subfields is deep literacy. A class of styles appertained to as "in- depth literacy" uses numerous machine literacy styles in multilayer neural networks to attack a variety of issues, including those involving words and film land.

Although deep literacy may be categorised as a neural network in general, there are several differences in the factual perpetration.

The core of deep literacy is a point literacy, which tries to gain hierarchical knowledge through hierarchical networks to handle substantial difficulties that preliminarily needed artificial design features. Some important algorithms are part of a frame called Deep Learning. For colorful operations, you must use different network models in order to achieve better issues (images, speech, and textbook).

With the development of deep literacy and the use of deep convolutional neural networks, face recognition delicacy and speed have vastly increased. But, as we've mentioned, the results of different networks and models are relatively different. The combined features are also trained and constructed using a deep neural network. In this study, facial attributes are attained by incorporating and differing different models. The advantages of numerous models may be used in this way to ameliorate recognition perfection. After acquiring a veritably realistic model, we develop a product model. This composition compares the garcon customer paradigm to the pure- customer system and discusses the advantages and disadvantages of each armature. It's also examined what different marketable goods are necessary for the garcon customer model.

Keywords: - python programming, AI, Face Recognition

1. INTRODUCTION

The process of determining whether a preliminarily observed item is a known or unknown face is known as face

recognition. constantly, the issue of face discovery and identification gets mixed up. On the other hand, face recognition determines if a " face" belongs to a known or unknown / strange person by validating the input face against a database of faces.

A face analyzer is a piece of computer software / algorithm or set of codes that utilizes a person's face to verify or attest their identification. It works by tracking, IDing & quantifying face aspects or facial marked points in photographs. Face ID technology can track, mark & recognise actual people's faces in films or videos, check to see if the same face appears in two unalike pics, images or videos of the same person, or browse a sizable database of previously used faces. Facial recognition is a technique used by biometric security systems to more effectively identify users during login or signup processes. Face analysis tech is also frequently used in mobile applications which secure device security.

2. LITERATURE REVIEW

Image and video analysis are just two applications for the image and video processing library known as Open-CV. We examine some current research on Open-CV-based on detection and recognition of faces.

Detection of Face: -

Alcantara et al. [1] "In order to track and ID the human head in real-time video, he proposed utilizing the Open-CV package." The initiated software system will utilise a Haar - like classifier to ID the head, and use Context-Matching-Guided Transformer (C-M-T) object tracking method to track the head. The results demonstrate that CMT can follow the head with 68% efficiency & find the head with 83% accuracies.

Gupta [2] offers a technique for IDing emotions in both moving & still pics. Hence, they must first recognise faces in still images or in-motion movies using Open-CV's Haar classifier before they can try emotion recognition. After, when the face has been tracked down or located, it can be cropped & subjected for evaluation to find other facial landmarks. Using S-V-M, they managed to achieve an accuracy of roughly 93,7%. It is possible to adjust these facial landmarks to increase accuracy. The datasets are then subjected to face

landmark conditioning and classified using the S-V-M, a machine learning technique, into the eight emotions.

Lee et al.'s [3] The goal of this study is to develop an smart & efficient human face ID system utilising the Visual Studio 2015 software architecture and Open-CV libraries/technologies in order to address the age-old problem of face detection in a variety of lighting circumstances. They used experiments to show that the processing method of a picture used in their research successfully performed facial ID in a variety of lighting situations, which is a utmost buildout in face ID technology.

Hoque et al. [4] made a piece of system software that ID faces in live videos or in photographs. AT-Mega-328-p the core of the control system is Open-CV and an electronic device Arduino Uno - based Micro Controller with Pan - Tilt capabilities. Many methods are used to recognise human faces, including the hair - Cascade, Cam-shift, House-dorff gap, AdaBoost, and Viola Jones. Face classification was carried out using the Cascade method Haar Classifier.

Mehariya et al. [5] devised the technique for addressing the issue of students missing lectures in university classes or any other location demanding workers' presence. In the same way that absenteeism is a waste of resources in terms of infrastructure, manually managing absences is a time-consuming operation that runs the risk of being manipulated. They developed an algorithm that provided the optimum occupancy ratio using Open-CV to determine the no. of pupils in class. The recommended methodology would be distinct from the usual method.

The occupancy ratio is utilised, it mainly determine a complicated classroom, and the detect Multi-scales process is used to count the no. of pupils in class. Multiscale detect is the first technique to identify a person in a photo. It does not take anything into account. The occupancy ratio is employed for complicated classroom allocation, and this count is kept in the predicting firebase. This lessens the amount of space that is wasted and enables us to efficiently create the timetable. Considerations include classroom size, projector availability, and dynamic allotment capabilities. Educational institutes files are maintained and stored using Google's cloud database (Firestore). There are also the attendance logs, rosters, timetables, and personal information.

Patel et al. [6] tossed the advance technique that detects if the driver is dozing off or awake when he/she operating/driving a car or any other large vehicle, and if the driver is detected of being dozing off, the device will tell the driver to wake up & control or cease/stop driving. Driver tiredness while operating a vehicle is one of the causes of collisions on public roads. As soon as the driver starts to feel sleepy, an effective method for predicting somnolence must be developed. This could aid in lowering the high rate of injuries. By using this technique, sleeping-related accidents among drivers might be decreased. He applied real - time image processing using a camera or a vision device, the method of facial expression, & eye blinking in the Open-CV environs.

3. MOTIVATION

This section reviews the most notable historical stages that have contributed to the furtherance of face ID technology :

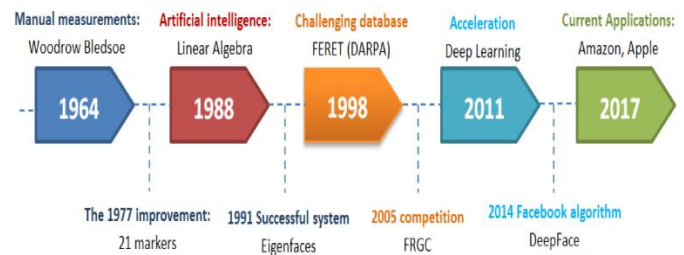


Figure – 1 : The history of face tracking and ID / recognition.

Year 1964: American academicians Bledsoe and his co-workers by this time were working on computer programming for facial ID. They envision a semi-automatic method in which employees must enter 20 computer measurements, such as the size of the lips or the size of the eyes.

Year 1977: In this year the addition of 21 more markers in the system was embellished. (e.g., lip width, hair color).

Year 1988: A.I was documented by this time in order to revamp upon tools that had a great many flaws which were earlier employed theoretically. With the use of mathematics ("linear algebra"), it was possible to simplify and alter pictures without using any human annotations.

Year 1991: Alex Pentland & Matthew Turk in this year got the first fortunate use of facial ID technology, Eigenfaces, developed at the Massachusetts Institute of Technology (M-I-T), enlists the statistical Principal component analysis (P-C-A) technique.

Year 1998: As time came near to the end of the 20th Century, The Defense Advanced Research Projects Agency (D-A-R-P-A) fabricated the Facial ID technology also known as Face Recognition Technology (F-E-R-E-T) took step to boosted up the business and academia to further research on this subject. This programme gave the globe access to a large, difficult database made up of 2400 photos for 850 people.

Year 2005: By the start of 21st century, In order to boost and improve face ID technology that will support current/present facial ID activities, the Face Recognition Grand Challenge (F-R-G-C) competition was established.

Year 2011: After, almost half a decade, Deep learning, a M.L technique which are based completely on artificial neural networks (A-N-N), boosted up everything in every field / sector. The comparison points are chosen by the computer; more photographs help it learn.

Year 2014: By this time, Facebook's own Deep-face technology allows it to identify faces. Facebook declares that their modus operandi comes almost precisely close to 97 percent to 98 percent of the performance of the real human eye.

The development of face recognition technology today has sparked numerous investments in applications for business, industry, law, and government. For instance, Apple recently updated its software and added a facial recognition feature that is now integrated into retail and banking.

Selfie - Pay, a facial ID system for online transactions, was founded by Mastercard.

Those in China who wish to buy a new smart phone will now provide their verification to the operator to examine their faces starting in 2019.

In 2018, Chinese police caught an accused of "economic crime" during a concert after utilising a smart A.I surveillance system based on live facial ID to recognise the suspect's face amid a throng of 50,000 people. The suspect's face was found in a national database.

4. CONCLUSIONS

Face recognition technology can be quite useful in the modern situation, when identity theft is pervasive, in combating identity fraud.

In 2019, 3.2 million fraud complaints were recorded to the Federal Trade Commission (FTC), of which 20.33 percent involved identity theft.

Current facial recognition technology that uses AI provides a high degree of precision and can even match the distinctive features of a human face. This technology may be used by a variety of businesses and organisations to significantly reduce the danger of identity fraud.

Facial recognition is a biometric tool used to identify people without the need for direct physical touch. Algorithms in the solution compare a person's facial nodes to the images stored in the database.

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