Cloud Based Face Recognition and Speech Recognition for Access Control Application

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Abstract:- Face recognition is one among the foremost wide used technologies, from a phone's lock screen to the foremost personal safe. it's used for identification, and security functions. It's accomplished by face detection, that is allotted by mapping an individual's face employing a combination of neural network and machine learning. Similarly, Cloud Computing is one among the trending technologies, it's a model for sanctioning omnipresent, sociable, high society network access to a shared pool of configurable computing resources. it's thought-about one among the foremost economical ways in which to store information firmly. Speech-to-text technology could be a widely used technology that is employed in google assistant, alexa, siri, google home, etc. This practicality of those services is extensively employed by individuals all around the globe, attributable to its ease of access, even by those that are unfamiliar with the smartphone world. This technology has conjointly exhibited hefty improvement in speech accent recognition. During this paper, we have a tendency to aim at implementing face recognition of the staff attempting to realize access to the workplace premises, by comparing the new non heritable facial info with the info set accessible within the cloud information. Speech-to-text technology is utilized so as to produce access to the guests.

Keywords:- Face Recognition, Cloud Computing, Machine Learning, Speech-To-Text

I. INTRODUCTION

In recent days, most of the events are machine-driven with the assistance of computing and machine learning. With the increase within the field of AI/ML, there has been an acute rise within the space of statistics, cloud-based information interpretation and storage. However, in fact, with the rise in new inventions, there's continuously the danger of an extra legal breach or spoof attack being created. In particular, with everything being biometric it's become easier to hack into one's security system resulting in fraud, security breach of prime organizations, inflicting a large loss. Like several different discoveries to be occurring within the past few years, Face recognition system has got to be one among the foremost economical contrivances. During this paper we have a tendency to discuss the effective ways in which FRS may be used for the betterment and a simple future. so as to enter the workplace nowadays, workers would like a tag-key or associate access card. Generally there may be casualties wherever associate workers may lose one's access card or forget to hold it with them. throughout these things, the door has got to be opened manually by another person, worrying about the operating setting. This doesn't solely consume time and needs further man supply however conjointly falters the main target of the workhouse. This paper deals with how face recognition could be a terribly powerful tool to keep up a high level of security in a corporation.

This methodology conjointly comes handy as a preventive security live throughout an occurrence response. It will establish a strong police investigation and watching system at the entry and exit points. As we have a tendency to be aware that, to enter bound licensed places, we'd like a tag key or associate ID. Just in case of the tag key larceny, or if the staff miss or forget the tag key, it needs for the door to be manually opened, and also the worker has to bear many stages of authentication. To avoid such consequences this project aims to develop a system that uses a face recognition system to regulate the lock system of the doorway door and speech-to-text recognition module for the guests or delivery waiting outside. The system helps the staff to unlock the doorway while not needing tag- keys. On the other hand, guests or delivery service waiting outside are requested to mention the name of the several workers, which individual workers are going to be notified with a mail regarding their presence. By doing thus, the corporate are going to be in advantage in 2 ways in which. First, it'll modify the method of getting into the workplace for workers. Second, it'll scale back the disturbance once a visitor desires to enter an associate workplace. The project setup looks to be terribly elementary and minimal creating it easier to put in moreover as use. The project is split into 2 sections; the experimentation section and also the implementation phase. If the experimentation section aims to seek out the foremost appropriate setup for the system, the implementation section lays the muse however the system is going to be enforced. The hardware consists of a tiny low laptop, camera, display, mic and speaker module for speech-to-text conversion. To hold out

the face recognition and speech-to-text conversion, the cloud-based platforms like Drop box, Amazon internet Services etc, are used severally. The ballroom dance authentication mechanism provides further security and protection against spoofing attacks and security breach techniques. The goal of this cloud-based face recognition and speech recognition access management application is, to beat the antecedently mentioned issue, and to change a cloud-based application, so the info may be changed over the net.

II. LITERATURE SURVEY AUTHOR, TITLE AND YEAR CONTRIBUTIONS AND OBSERVATIONS

➢ *Nathalie Tkaue, Thao Tran, kevin Hernandez-Diaz, Fernando Alonso-Fernandez, "Cloud primarily based face and speech recognition for access management applications", ITE 2020.*

This paper describes the implementation of a system to acknowledge workers and guests eager to gain access to a physical workplace through face pictures and Speech-to-text recognition. The ballroom dancing face authentication mechanism for workers provides AN enhanced level of security and protection against spoofing attacks while not the requirement of carrying tag keys or access cards, whereas disturbances by guests or courier area units decreased by notifying their arrival to the proper worker. Face recognition and speech to text conversion area unit through with the cloud-based solutions provided by Amazon internet sevices and Google speech to text severally. The common time spent by AN worker till the door unlocks is of twenty.3 seconds which can be perceived as high, though it provides a secure and correct technique for access management.

➢ *S Snigdha, K Haribabu, "IoT primarily based system victimization raspberry PI and mail server", IJITEE 2019.*

This project aims to extend the security of homes with the assistance of IoT integration of web security integration with a mail server. The main reason for the event of this method is that it saves time and energy, still as making certain security and convenience. It includes the specifications still as methodologies of raspberry Pi and Pi camera. These devices additionally profit users with reduced quality that will be tough to get or maybe reach lightweight changes. The final word goal of this project is to form a home security system using Raspberry slices. This project relies on the fashionable value and may be simply managed as our homes can experience their house conversion, constant interaction with networks that square measure perpetually seeking to enhance energy management and full home automation to confirm comfort, safety and privacy.

➢ *Amit Chakraborty, "Image process and Image Pattern Recognition, a Programming Tutorial", IEEE2018.*

This paper delves into the conception of Pattern Recognition. Pattern recognition could be a major field as an associate degree application of machine learning that is evolving dynamically with a variety of platforms out there to its users. The methodology of image and pattern recognition consists of a sequence of image and pattern process tasks, classifier formula development, coaching and testing that is followed by development. So as to supply sensible programming experience the paper emphasizes on three reality applications of image and pattern recognition like ALPR mistreatment Tesseract OCR.

➢ *Muhammad Azam, Nizar Bouguila,"Speaker Verification mistreatment custom-made finite Gaussian Mixture Model",* IEEE 2018.

This paper discusses the application of finite Gaussian Mixture Model (BGMM) to speaker verification. The BGMM is utilized for UBM that is employed in biometric verification. The projected UBM could be a large BGMM trained to represent speaker-independent issues of options. In the changed speaker approach, a hypothesized speaker model is brought out by adapting the parameters of BGMM based mostly on universal background model mistreatment of speakers coaching speech and most a posteriori (MAP). We've introduced TIMIT and TSP speech corpora for the event of UBM and any testing of speaker verification by custom-made speaker model. The brought forward framework has incontestable effectiveness by improved speaker detection rate.

➢ *Shilpi Singh, S V A V Prasad, "techniques and challenges of face recognition: A important review", ICACC 2018.*

In this paper, the author says face recognition is one amongst the foremost issues in recognizing objects and laptop vision. A variety of biometric applications square measure out there in our daily life for human recognition like eyes, fingerprint, face recognition, etc. Face recognition is employed in numerous applications like security, rhetorical investigation etc. For up the accuracy on completely different info, they introduced face synthesis. The foremost drawback in alternative biometric options is that they need active cooperation of the person for authentication. not like face recognition. Verification and identification square measure the 2 necessary tasks in recognition of face. Their square measures four main options like eye, lip, nose and mouth in face recognition. and that they primarily have second and 3D dimensions with completely different textures and facial expressions. There are four major steps in face recognition, detection of the face, face alignment, feature extraction, feature matching from info to recognized face compared with different face info for accuracy and recognition rate.

➢ *Girish Talmale, "Raspberry PI based mostly security system on IoT Platform", analysis gate 2017.*

This paper discusses the survey on completely different security strategies on movement discovery yet advances in the ease checking framework visible of Raspberry Pi, a solitary Mastercard estimate board laptop that takes once motion detection calculation written in python as a debating default programming environment. we have a tendency to any perceive the safety system with IoT in numerous frameworks like, human motion detection mistreatment passive infrared sensing element, coming up with and

implementing on security systems supported GSM technology, good police work mistreatment PIR network, proximity motion sensing element security system, advanced guard with PIR sensing element then on. It conjointly includes issues/ limitations expected from face recognition systems. It conjointly includes issues/limitations expected from the favorite recognition system. This examination venture is completed to come to a decision on some of the elemental human movement location calculation that had been established or created or maybe investigated in the past.

➢ *letter N Natsheh, B Li, A G Gale, "Security of multi-frame DICOM pictures mistreatment XOR encoding approach", ScienceDirect 2016.*

According to this paper, transferring medical/surgical connected pictures over networks is exposed to a good sort of security risk. Hence, there's a requirement of a secure mechanism to exchange medical/surgical pictures over the net. The DICOM conjointly referred to as Digital Image and Communication in drugs provides attributes for information confidentiality however not for the pixelated image data. During this paper, the approach for element information is easy and effective encoding that is provided for multi-frame DICOM medical/surgical pictures. The aim of the projected approach is to scale back the encoding and decoding time of those pictures, mistreatment AES i.e, Advanced encoding customary wherever just one image is encrypted and XOR cipher for encrypting the remaining multi-frame DICOM pictures. The projected formula is calculable and evaluates mistreatment process time, normalized correlation, entropy, PSNR (Peak-Signal-to-Noise-Ratio) and bar chart analysis. The results reveal that the projected approach will cut back the encoding and decoding time and ensures the image confidentiality.

➢ *Prerana Das, Kakali Acharjee, Pranab Das, Vijay Prasad, "Voice recognition system: Speech-to-text", JAFS 2015.*

This paper discusses varied approaches out there for developing a Voice Recognition System, that enables the pc to translate voice request and dictation into text. it's a system that consists of 2 elements, one is for process signals captured by the electro-acoustic transducer and also the alternative to interpret the processed signal, this processed signal is then mapped to words.

➢ *Xuee Maya Lin, Jian yang, Juan Zhao, "The text analysis and process of Thai language text to speech conversion system", IEEE 2014.*

This paper deals with the text-to-speech conversion of Thai language, which can contain non-Thai customary characters like range, currency symbols, and alternative such special characters. During this paper, they need enforced text standardization methodology.

➢ *Abdullah A, Albahdal and Terrance E, Boult, "Problems and guarantees of mistreatment of the cloud and biometrics", IEEE 2014.*

This study provides a fast summary of the mutual benefits of the bioscience era and cloud computing. It conjointly tells the USA however cloud computing will profit from the durable authentication assets of bioscience so as to appear into the security of the cloud and introduce new carrier models. On the opposite hand, the bioscience era will use the cloud's infinite process resources and appealing homes of flexibility, quantifiability, and worth discount to cut back the biometric system's wants for varied process resources like process energy or record storage and to boost the performance of the biometric system processes. And here we tend to conjointly see the five capability regions wherever they square measure mutual advantages between the cloud and bioscience. Moreover, for each five regions, bioscience or the cloud will clear up the problems with the present state of design. Later, the challenges of coping with bioscience or the cloud packages in each place square measure mentioned.

➢ *Diego von Sohsten, Sergio Murilo, "Multiple Face Recognition in period mistreatment Cloud Computing, EmguCV and Windows Azure", IEEE 2013.*

This article proposes the utilization of cloud computing- a lot of specifically, Windows Azure platform- to spot potential performance gains whereas testing the EmguCV framework.

➢ *Kui Ren, Cong Wang, Qian Wang, "Security challenges for the general public cloud", IEEE 2012.*

This paper discusses tremendous advantages of cloud computing, regarding however it provides opportune access to a centralized pool of computing resources, and just in case of crisis, the cloud ensures that the information is insured and guarded, despite the advantages, security and privacy considerations have forever been the first obstacle in wide adoption of this technology. Cloud platforms each face internal and external privacy threats from software package bugs, malware, malicious insiders and such. This paper discusses however cryptography strategies, like absolutely homomorphic cryptography (FHE), is adopted to enhance the safety of cloud computation. Therefore, by addressing security challenges that don't seem to be nevertheless recognized by the present security thrusts, this text intends to inspire more investigation of the many security problems which may impact the longer term of public cloud.

> *Di Huang, Mohsen Ardabilian, Yuhong Wang, Liming subgenus Chen, "Automatic Asymmetric 3D-2D face recognition", IEEE 2010.*

This paper presents the problems of 2nd face recognition, that happens because of variation in illumination, creating and varied alternative facial expressions, which will modify overtime. On the opposite hand, 3D face recognition techniques also are restricted because of their high computation value. The goal of this paper is to limit the usage of 3D information. The strategies conferred by this paper consists of 2 matching steps, distributed illustration Classifier (SRC) for 2D-2D matching and Canonical Correlation Analysis. The uneven 3D-2D face recognition technique projected during this paper, improves the hardiness of the popularity method to illumination and create variation.

> *D. Kesavaraja, D. Sasireka, D. Jeyabharathi, "Cloud software package as a service with Iris Authentication", JGRCS 2010.*
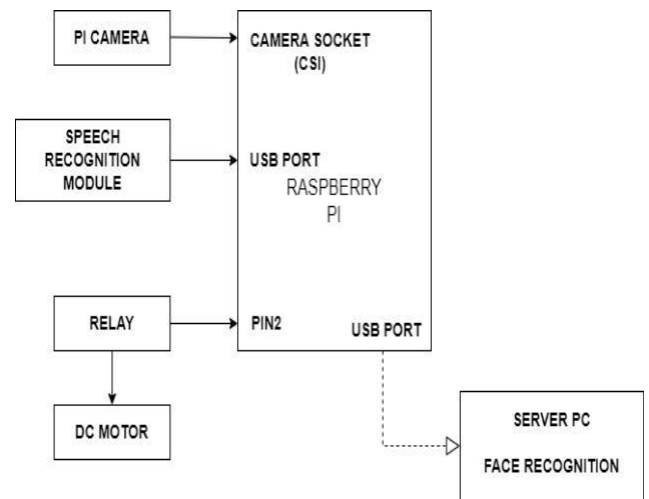
This paper presents a security mechanism, so as to change solely licensed access to Saas, from cloud server. The safety technique projected here is, Cloud Iris Verification System (CIVS). This method compares a freshly obtained iris with a retrieved pattern of iris, from the info. The iris recognition technique employs an accumulative ad primarily based on gray modification analysis. This paper proves that CIVS server stands distinctive in providing secure service. Here, so as to extract iris options, the iris image is split into basic cells. The experimental lead to this paper, shows that this approach incorporates a smart credit performance, and provides extremely secure service to consumers.

> *Andrea F Abate, Michele Nappi, Daniel Riccio, Gabriele Sabatino, "2D and 3D face recognition", ScienceDirect 2007.*

The 2nd image analysis that isn't nevertheless strong enough to be utilized in sure security applications. By operating in 3D, this limitation is overcome however it's quite expensive. This paper has come back up with associate degree ideology to effectively solve this downside by mistreatment associate degree uneven protocol whereby the face is recognized in 3D however the identification is being performed for the 2nd pictures of a similar as in to succeed in the goal of constructing a lot of strong system that may be utilized in security applications because the facial expressions keep ever-changing. The 3D analysis of the face of a replacement user is completed beneath controlled lightweight and with neutral expressions and has been added to the info. Then the management points square measure settled on the 2nd image which can then correspond to the points in 3D and this may then be recorded within the info. This paper deals with the matter of selecting these management points for addressing the invariants of 3D imaging. The localization of the management points is simulated by selecting the points by hand on the probe and so rotating them supported the poses thought-about during this

projected model thereby creating it a lot stronger than the opposite strategies.

III. PROPOSED BLOCK DIAGRAM AND METHODOLOGY

The pi camera is custom created for raspberry pi. The employee's facial information is non-inheritable by the pi camera and it's uploaded to the raspberry pi. This info is processed by the Raspberry Pi supporting the program i.e drop into the microcontroller and also the processed info is compared with the facial info of the workers out there within the info that is given on the cloud. looking on whether or not the match is found or not, a message is distributed back to the raspberry pi to open or shut the door. If a match is found, the program is intended in such a way that the raspberry pi controls and activates the relay for a specific quantity of your time for the door to be opened and closed. The mechanism of gap and shutting of the door/the lock system is doled out by the DC motor. The speech to text module permits the traveller to fulfill the several workers by recording the speech of the traveller, which can be either the employee's name or the employee's code and it's fed into the raspberry pi. The software package converts this speech into text and compares the reborn text with the worker} details offered within the cloud information and notifies the various employee.

IV. CONCLUSION

Security of a company is very necessary and so can not be simply compromised. higher than may be a study on varied face recognition strategies to implement face detection of the workers. Storage of information of the facial info of workers is enforced victimization cloud computing technology, wherever the datasets square measure hold on firmly and square measure invariably secured with the assistance of the net. The recently non-inheritable facial info is uploaded to the Raspberry PI and analyzed on the cloud, by examination with the offered dataset. Corresponding message is passed to the microcontroller once a match is found. Speech-to-text module allows the guests to satisfy the various workers by

causing a message to the worker. Thereby, the whole system reduces manual power to access the doors of the workplace.

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