FACE RECOGNITION: WHY IT IS IMPORTANT TO OUR BUSINESS

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Abstract. *For humans, recognizing faces is an easy process. Babies as low as one to a few days old can also additionally recognize acquainted faces, consistent with experiments. It seems that we still don't apprehend much approximately human recognition. Are outside traits (head shape, hairline) extra vital for correct face identity than inside features (eyes, nose, mouth)? Numerous researchers are searching at face recognition with a purpose to uncover the solutions to those sorts of problems. As a result, numerous sectors make substantial use of Face recognition technology. Face recognition technology is a biometric technology, which is based on the identification of Face features of a person. People collect the face images, and the recognition equipment automatically processes the images. The technology of Face recognition is growing in popularity and adoption. This is particularly true among businesses, which see the value of this technology and are exploring ways to implement it in their operations. This article will explain why companies should consider implementing Face recognition software and services in their businesses, as well as the different uses for this technology that is becoming more common among businesses.*

Keywords: *business, commerce, technology, face recognition, phyton*

Introduction. Face recognition technology has a plethora of makes use of innovative home tracking is made viable with the aid of using technology like Lighthouse. Facial recognition is in the limelight today more than ever. Previous historical events have resulted in a quick hike in face recognition investments. Given the worldwide COVID-19 epidemic, we may anticipate more investment in biometric technologies like facial recognition. Given the extremely infectious nature of COVID-19, there is a strong emphasis on contactless interactions. The principal use of face recognition technology continues to be security solutions. Facial recognition is recognized as one of the most accurate and easy ways for establishing individual identity across a wide range of sectors. The system contains of a camera which could become aware of children, adults, animals, and thieves similarly to the most common site visitors to a domestic. An extra well-known instance is Facebook, which routinely tags friends in uploaded photographs the usage of Face recognition algorithms. Facetime , another created work, makes use of this form of generation to track employees' running hours. The Chinese organization Tencent, which has one of the best Face recognition algorithms, gives some of services, together with face detection, characteristic detection, and identity. Face recognition became decided to be an excellent subject matter to be very well researched, which became inspired with the aid of using each the high-quality results and the accessibility of ready to -use device studying methods. Facetime is

an instance of a work that makes use of simply pretrained models and achieves a decent performance. The preference to create such structures increased due to the wealth of records that became made to be had for free and the notion of financial potential. Face recognition software is designed to detect and recognize an individual based on their face. This software may be used for identification, authentication, or analysis, and it can identify people in images or videos and track people's movements through a facility. Face recognition is often used in law enforcement but is also common in business settings and other industries. Face recognition software uses algorithms to compare images of faces to a database of known faces. This technology can be applied to many different areas, including hiring practices and employee monitoring. It can also be used to measure the success of marketing campaigns by recognizing the reactions of individuals when they see your advertisements. Finally, Face recognition can be used to track attendance, monitor entry, and exits to a facility, or control security access.

Material and methods. Object Recognition and Machine Learning Overview "Machine learning" refers to the study of algorithms that evaluate data to help computer systems become more accurate at a task over time. The goal of machine learning is to "learn" how to perform a desired activity better in order to continually improve the task at hand for computer systems. Making algorithms that the machines can utilize to learn automatically helps with this endeavor. Spam filtering is one use of machine learning where the program continuously learns what the user deems spam and what is not. Computer systems can detect and recognize things more accurately with the aid of machine learning. The ability of a computer system to recognize an object in an image and determining its presence in the image is

called object detection. One type of object recognitions is facial recognition. This technology allows you to automatically check digital photos of people by comparing them with a database of images [1].

Security of people, information, and assets is getting harder to maintain and is growing increasingly crucial. Organized crime such as credit card fraud, computer hacking or security breaches is on the rise. A branch of biometrics called facial recognition technology is used to identify people. The first face recognition algorithms were established in the 1960s, using geometric characteristics to identify faces and detect people. In 1973, the first automated facial recognition system was introduced by Kanade, when Template matching was the standard method for face detection. After fourteen years, the idea of Eigenface using "principal component analysis" (PCA) was introduced by Turk and Pentland [2].

Belhumeur et al. made more improvements to Eigenface. Face intensity images ,also called "2D images", are used frequently in face recognition systems, and most studies. Increasing the face's, nose, eyes, and other features' depth. the face or a three-dimensional form is represented by "3D pictures." A thorough analysis of both 3D and 2D face recognition is provided. Since the last two and a half decades, the field of "Face Recognition" has been actively researched, computers are getting smarter and smarter, and a variety of applications have been developed, as well as artificial intelligences, entertainment, gaming, and Human Computer Interface (HCI) security [3].

Even though the history of face recognition dates back to the 1950s and 1960s, research on automatic face recognition began in the 1970s. By the 1970s, there was an increase in interest in facial recognition studies [7].

Wang and Deng broadly categorize

the development of image-based face recognition systems from the early 1990s into four key conceptual development eras. Although this taxonomy is not exhaustive, it does capture the historical evolution of the most important approaches. For facial recognition, several algorithms have been put forth. The fields of network security, access control, and multimedia information have all benefited from face recognition. The videotapes databases are searched by Chan, Liv, and Kun using facial recognition algorithms to find images of specific individuals [7].

With a small parameterized facial model, Li, Roivainen, and Forchheimer encode the face pictures for low-bandwidth communication applications. A level of accuracy comparable to human perception has been achieved by some of these algorithms. [8]

Wang and Deng divided the development of image-based face recognition approaches since the early 1990s into four broad conceptual development stages, which although not a comprehensive taxonomy, represents the historical evolution of the main methodologies [4].

The first efficient Eigenfaces method is used which invented by Turk and Pentland. After the 2010s, techniques that employ learning-based local descriptors became popular. These techniques use shallow method to learn the discriminant image filters. Ding and Tao did research on posture and lighting invariant face recognition techniques [5]. A video created by Barr, Bowyer, Flynn, and Biswas shows the face dynamically. In addition to 3D and infrared methods, Bowyer, Chang, and Flynn conducted research on multimodal face recognition [6]. The literature has a wide variety of techniques for identifying faces in photographs. The existing techniques can be divided into two main levels which are

professional techniques for knowledge and modern techniques for organization visibility. Knowledge is based on the production of products that make up the face of specific people. To identify the people in the face photos, faces need first be identified and then recognized. The majority of the techniques in the literature employed pictures from a face library that was on hand and contained common pictures. 2D photos are utilized as the input for 2D procedures, and some learning/training techniques are employed to categorize the identification of persons.

Facial recognition technology offers a number of benefits for businesses of all types and sizes. Most importantly, facial recognition time attendance systems can be used to track attendance at work, whereas this is often a challenge without this technology. Additionally, face recognition can be used to identify visitors who enter the business premises, which is particularly useful for larger organizations with multiple entrances. If your employees are using the facial recognition software on their computer or mobile device, it can be used to track their time at work, which can help to increase the accuracy of time tracking and ease the burden on employees to calculate their hours. Finally, facial recognition can be used to identify individuals in photos or videos, which can help businesses to solve cases of false advertising, theft of intellectual property, or other issues.

Results. *Ways business are using the face recognition: -* Hiring Practices – Facial recognition can help businesses identify individuals who are interviewing for a job, which can be particularly useful for companies that receive many applications for employment. This software can help to ensure that the right individuals are being interviewed, while also reducing the likelihood that an individual is being falsely

represented during the hiring process.

– Employee Monitoring – Facial recognition can be used to track employee attendance and monitor the length of time that individuals spend in some regions of the workplace. This can be helpful for companies that want to track whether employees are following the appropriate safety procedures or remaining within the facility's correct areas.

– Marketing Campaigns – Companies can use facial recognition to track the success of certain marketing campaigns by using photos or videos that show individuals the advertisements. This can help to measure the reaction of individuals, which can help determine the value of a given ad campaign.

Keys to success when using face recognition software:

– Accuracy – The first key to success is facial recognition software accuracy. In order for this technology to be effective, it must be able to accurately identify individuals and match them with information in the database. Without this accuracy, the software will be ineffective and, in some cases, even harmful to the organization.

– Security – The second key to success when implementing facial recognition software is security. While this technology can be helpful in many ways, it can also open the door to misuse if the information is not kept secure. In order to protect sensitive information, as well as the rights of employees, businesses should carefully consider security measures when using facial recognition software**.**

Face recognition software is not without its challenges, and companies must keep these in mind when deciding whether to implement it and how:

The challenge is to collect photos or videos of individuals who will be tracked. This may not be easy for some organizations; There is the issue of maintaining a database of photos or videos of individuals, including hiring new employees. This can be tedious and time-consuming, and collecting photos or videos in certain settings, such as outdoors, may be challenging;

There is a matter of accuracy when matching faces to the database;

If the software is too strict, it may misidentify individuals.

Facial recognition time clock software is designed to recognize an individual's face and mark the person as having entered the building or having clocked in for work. These time clock systems can be integrated with other time tracking software, such as payroll, to ensure that it accurately records the time individuals spend at work. When facial recognition time clock software is used, employees are prompted to scan their faces at the beginning and end of their shifts. This information is then recorded in the software and matched with the employee's work hours. Time clock software with facial recognition functionality is helpful for businesses that have many employees who do not use a physical time clock.

While facial recognition software can be helpful in many ways, there are also some privacy concerns associated with it. Organizations need to be aware of these privacy issues and minimize them, such as not using facial recognition software on individuals who have not consented to be monitored. Individuals may also be concerned about how their information is being used, so businesses need to be transparent about using facial recognition software and explain to employees how the information is being used. Additionally, companies should consider implementing a facial recognition privacy policy that outlines how the organization will protect sensitive information and how individuals can request the removal of their images from the database.

Conclusion. Businesses should be aware that facial recognition technology is growing in popularity and is being adopted by many different organizations, including law enforcement agencies. This technology offers a number of benefits for businesses, including the ability to improve hiring practices and employee monitoring, as well as track the success of marketing campaigns.

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