# Face Recognition Attendance and Mask Detector

**Abstract:**

Classroom attendance checking is a contributing element to student engagement and the final triumph in the courses. Gaining attendance by calling over the names or moving around an attendance file are both time-consuming and hectic, especially the other half is to open passage to easy types of frauds. Face recognition and detection are used to regulate the location and adjustments of the faces in the ongoing class-room images and obtain some sub image for each face. Also, in face recognition, the taken face images which are detected will be differentiated with the database consisting of the images of people in the class, and then the attendance will be recorded appropriately. Neural networks are used for mostly most of the things these days. This project proposed is aimed to build a face recognition and mask detector, where the position will define the type of face to be achieved and the position names as well.

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Facial recognition is a way of identifying or confirming an individual's identity using their face. Facial recognition systems can be used to identify people in photos, videos, or in real-time. Facial recognition is a category of biometric security. Other forms of biometric software include voice recognition, fingerprint recognition, and eye retina or iris recognition. The technology is mostly used for security and law enforcement, though there is increasing interest in other areas of use.

The technology is used for a variety of purposes. These include:

- Unlocking phones

Various phones, including the most recent iPhones, use face recognition to unlock the device. The technology offers a powerful way to protect personal data and ensures that sensitive data remains inaccessible if the phone is stolen. Apple claims that the chance of a random face unlocking your phone is about one in 1 million.

- Law enforcement

Facial recognition is regularly being used by law enforcement. According to this NBC report, the technology is increasing amongst law enforcement agencies within the US, and the same is true in other countries. Police collects mugshots from arrestees and compare them against local, state, and federal face recognition databases. Once an arrestee's photo has been taken, their picture will be added to databases to be scanned whenever police carry out another criminal search.

Also, mobile face recognition allows officers to use smartphones, tablets, or other portable devices to take a photo of a driver or a pedestrian in the field and immediately

compare that photo against to one or more face recognition databases to attempt an identification.

- Airports and border control

  Facial recognition has become a familiar sight at many airports around the world. Increasing numbers of travellers hold biometric passports, which allow them to skip the ordinarily long lines and instead walk through an automated ePassport control to reach the gate faster. Facial recognition not only reduces waiting times but also allows airports to improve security. The US Department of Homeland Security predicts that facial recognition will be used on 97% of travellers by 2023. As well as at airports and border crossings, the technology is used to enhance security at large-scale events such as the Olympics.

Fig. 1.1 Airport Face Recognition

- Finding missing persons

  Facial recognition can be used to find missing persons and victims of human trafficking. Suppose missing individuals are added to a database. In that case, law enforcement

can be alerted as soon as they are recognized by face recognition — whether it is in an airport, retail store, or other public space.

- Reducing retail crime

  Facial recognition is used to identify when known shoplifters, organized retail criminals, or people with a history of fraud enter stores. Photographs of individuals can be matched against large databases of criminals so that loss prevention and retail security professionals can be notified when shoppers who potentially represent a threat enter the store.

- Improving retail experiences

  The technology offers the potential to improve retail experiences for customers. For example, kiosks in stores could recognize customers, make product suggestions based on their purchase history, and point them in the right direction. “Face pay” technology could allow shoppers to skip long checkout lines with slower payment methods.

- Banking

  Biometric online banking is another benefit of face recognition. Instead of using one-time passwords, customers can authorize transactions by looking at their smartphone or computer. With facial recognition, there are no passwords for hackers to compromise. If hackers steal your photo database, 'liveless' detection – a technique used to determine whether the source of a biometric sample is a live human being or a fake representation – should (in theory) prevent them from using it for impersonation purposes. Face recognition could make debit cards and signatures a thing of the past.

- Marketing and advertising

  Marketers have used facial recognition to enhance consumer experiences. For example, frozen pizza brand DiGiorno used facial recognition for a 2017 marketing campaign where it analyzed the expressions of people at DiGiorno-themed parties to

gauge people’s emotional reactions to pizza. Media companies also use facial recognition to test audience reaction to movie trailers, characters in TV pilots, and

optimal placement of TV promotions. Billboards that incorporate face recognition technology – such as London's Piccadilly Circus – means brands can trigger tailored advertisements.

- Healthcare

  Hospitals use facial recognition to help with patient care. Healthcare providers are testing the use of facial recognition to access patient records, streamline patient registration, detect emotion and pain in patients, and even help to identify specific genetic diseases. AiCure has developed an app that uses facial recognition to ensure that people take their medication as prescribed. As biometric technology becomes less expensive, adoption within the healthcare sector is expected to increase.

- Tracking student or worker attendance

  Some educational institutions in China use face recognition to ensure students are not skipping class. Tablets are used to scan students' faces and match them to photos in a database to validate their identities. More broadly, the technology can be used for workers to sign in and out of their workplaces, so that employers can track attendance.

- Recognizing drivers

  According to this consumer report, *car companies* are experimenting with facial recognition to replace car keys. The technology would replace the key to access and start the car and remember drivers' preferences for seat and mirror positions and radio station presets.

- Monitoring gambling addictions

  Facial recognition can help gambling companies protect their customers to a higher degree. Monitoring those entering and moving around gambling areas is difficult for human staff, especially in large crowded spaces such as casinos. Facial recognition technology enables companies to identify those who are registered as gambling

and keeps a record of their play so staff can advise when it is time to stop. Casinos can face hefty fines if gamblers on voluntary exclusion lists are caught gambling.

- **Examples of facial recognition technology**

1. Amazon previously promoted its cloud-based face recognition service named Rekognition to law enforcement agencies. However, in a June 2020 blog post, the company announced it was planning a one-year moratorium on the use of its technology by police. The rationale for this was to allow time for US federal laws to be initiated, to protect human rights and civil liberties.
2. Apple uses facial recognition to help users quickly unlock their phones, log in to apps, and make purchases.
3. British Airways enables facial recognition for passengers boarding flights from the US. Travellers' faces can be scanned by a camera to have their identity verified to board their plane without showing their passport or boarding pass. The airline has been using the technology on UK domestic flights from Heathrow and is working towards biometric boarding on international flights from the airport.
4. Cigna, a US-based healthcare insurer, allows customers in China to file health insurance claims which are signed using a photo, rather than a written signature, in a bid to cut down on instances of fraud.
5. Coca-Cola has used facial recognition in several ways across the world. Examples include rewarding customers for recycling at some of its vending machines in China, delivering personalized ads on its vending machines in Australia, and for event marketing in Israel.
6. Facebook began using facial recognition in the US in 2010 when it automatically tagged people in photos using its tag suggestions tool. The tool scans a user's face and offers suggestions about who that person is. Since 2019, Facebook has made the feature opt-in as part of a drive to become more privacy focused. Facebook provides information on how you can opt-in or out of face recognition here.
7. Google incorporates the technology into Google Photos and uses it to sort pictures