Part A – Case Study

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Introduction
A facial recognition system is an artificial intelligence technology that is used to identify a person from a video frame or still image.
There are multiple methods in which facial recognition systems work, but in general they work by comparing specific facial features and distances from specific points on the face, from a given image with faces in a database.
The most common applications of this AI is in payments (cardless payments) and access and security (face ID on phones and laptops).

The History of facial recognition starts with Bledsoe, Charles Bisson and Helen Chan in 1964 when they tried to use a computer to recognize human faces, but because they were funded by an intelligence agency, they could not release their work. The way that Bledsoe's program worked was by the human marking the centre of specific facial features (eyes, mouth) and then the computer worked out the various distances between the places and compared them to images to match with an identity.
The next major development was by Christoph von der Malsburg. He developed the Bochum system was the most accurate facial recognition system in the world at that time and was able to identify people with accessories and facial hair. It could also identify from imperfect face views. It was used first by the Deutsche Bank and various airports.
The most recent major developments happened in 2006 in the Face Recognition Grand Challenge. The programs show here were able to identify people more accurately than humans..
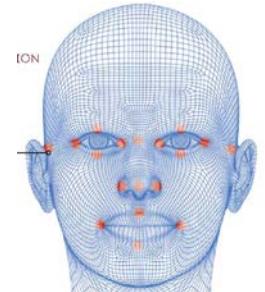
NODAL POINTS
→ Human faces typically have in the region of 80 nodal points
→ Facial recognition software pays particular attention to the distance between the eyes, the width of the nose and the shape of cheekbones

Focus case – description of the chosen application of technology. (200 – 250 words)

Digital Barriers is a security and investigations technology company based in London. They have recently developed a live facial recognition based AI. It is described on their website as being "software solutions and cloud services to manage the capture, analysis and streaming of live video, enabling actionable video intelligence to be delivered where it is needed, when it's needed.".

SmartVis

This technology was developed by Digital Barriers for the purpose of detection, recognizing and tracking of people from a list of known people. The facial recognition AI in SmartVis Facial Recognition is revolutionary because it is the first facial recognition AI that works in the real world in real time.

There are many different applications of SmartVis Facial Recognition, you can use the software on a mobile app, where you take a photo or video of a person's face and it can see if the face is stored in the database, it can be added to pre-existing security systems, and can be incorporated in police body worn cameras.
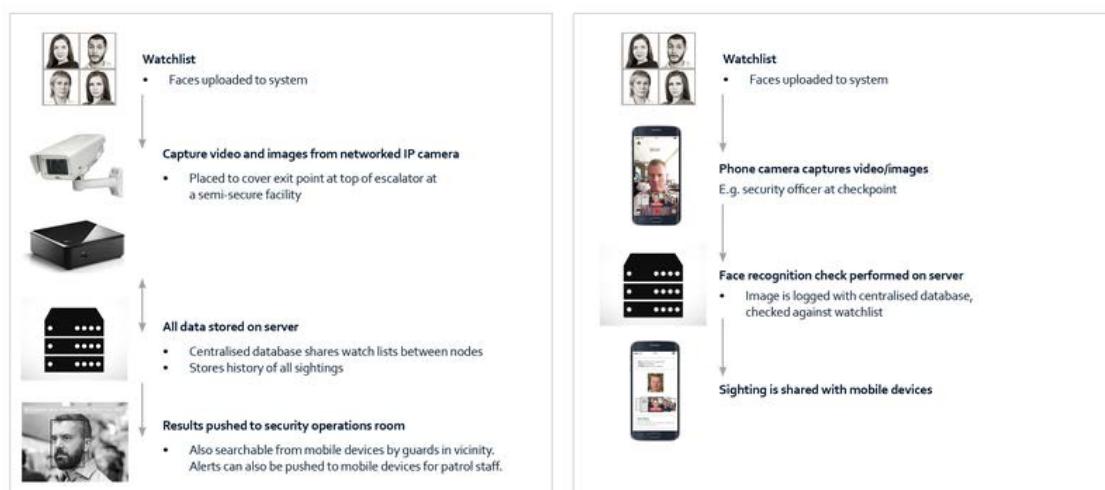
The company Digital Barriers has recently released some of their technology for free to help the search for missing young people The way in which this will be implemented is by cameras being set up in major public areas (e.g. train stations, city centers) and when the system identifies a missing person, by presenting a percentage match, it alerts the owner of the system. It also doesn't only use facial recognition AI, it is built with machine learning. The machine learning means that the system is able to improve and become increasingly accurate the longer it is deployed in the real world and used in specific environments.

Analysis

As this technology is extremely new, there are no documented cases of this being implemented in the real world. Currently it has been deployed in Stratford and it is planned to be rolled out in other counties in England. We will know more about the positive and negative potentials of this technology in the next few months. To date, SmartVis Face has only potentially been used by private companies and the military these groups haven't released any data or reports onto the internet.

Positive:

The use of this technology for the police will help many people. This technology will be used to catch dangerous criminals when they are in public places and this in turn means that it has the potential to save lives by identifying dangerous criminals that will continue to commit crimes. It can make a community a safer place.

As it is being released free to national and local authorities in the UK who are involved finding missing young people, this will positively affect many families as they are able to find missing children. This also enables more agencies to begin searches for missing people as they are providing the technology for free. The fact that SmartFace Vis is able to be used on both iphones and security systems means that the owners of smartvis/ edgevis servers have more ways in which they can identify people.

As of now this technology doesn't keep storage of all of the 'unknown' people it identifies. This is good as there are concerns about innocent people's privacy being invaded and this means that unnecessary data is being collected on people.

Another positive of the actual AI system is it's inbuilt machine learning that means it can improve more and more the longer it is deployed. It is estimated that the systems will become 10 times more effective every three to six months. The system will become faster and more accurate at identifying criminals and others on the watchlists.

Negative:

The way that this technology works is by alerting the user if the percentage match is high enough, but it will never be a 100% match in the conditions that SmartVis is supposed to be used in. This can mean the system might alert for a wrong match and the person might be taken into custody. While overall in the long run this technology can benefit society, there are groups who argue that it is an invasion of privacy as they will have to prove to the police that they are not a criminal.

Another negative is if the criminal is wear a hoodie, mask or anything else that has the potential to obscure their face, it makes it almost impossible for the systems to identify the person correctly as this system requires the full face to be exposed. The biggest problem is that at the moment it is quite easy to get past he cameras if you know where they are when these systems become more widespread, it will become easier . This could also lead to religious discrimination as some women of islamic faith choose to wear burkas and this would create a loophole for criminals.

There is also already pushback from groups of concerned citizens that believe their privacy will be invaded, their arguments will have to be looked into in the future to determine whether they make valid cases against the development and deployment of this technology

Conclusion/Justification

Tony Stark:

Digital Barriers SmartVis Facial Recognition technology, is an AI system that is used to find lost people and identify and track criminals.

There are many positives to this technology as it has been used to help many people in the past five years.

SmartVis has been integrated into many of the Avengers suits (including my own) and has meant that the Avengers have had access to the latest technology that has helped identify civilians and criminals as seperate people and led to less harm for the innocents. This technology has also meant that the police have become more independent and capable of taking on bigger assignments on their own, without the help of the Avengers. The way in which this impacted society is by the fact that more criminals have been arrested than ever before and that the Avengers are able to take on the larger criminals without having to worry about smaller ones running loose in the city.

I have also been able to use this technology is by integrating it into my security systems to find if any criminals with vendettas against me have entered Stark Tower. Many other important businesses and companies have used this in a similar way.

As this technology was first deployed in the police force it has enabled the Avengers work more cooperatively with the police and CIA and this has been very helpful as it means more people are able to be involved in the finding process, making it much quicker than it has ever been.

There are still risks involved in using this technology. Some of these include; the potential for hacking and finding a lot of sensitive and personal information of the people on the watch lists, an innocent person being placed onto the watchlist, the requirement of camera and security infrastructure for the AI system to run on and the cost of maintaining all of the systems.

While there are risks to using this technology, the ratio is skewed positively and the experiences with this technology over the past five years has shown that it creates safer cities and communities, and overall has a very positive effect on society. Therefore, SmartVis Facial Recognition technology should be used in society as it helps and benefits many.

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Annotations:

https://www.digitalbarriers.com/news/bbc-news-london-features-digital-barriers-facial-recognition-technology/

This source is a news story by the BBC. It was published on the 5th of July 2018. It includes a demonstration of the facial recognition working in a live crowded area and provides commentary on the two sides to the debate on facial recognition. I believe that this source is somewhat biased as it is displayed on the Digital Barriers website and it has been done as a partnership between digital barriers and the BBC. This source was very relevant for me as it was one of the only sources that demonstrated how the technology actually worked in real life.

https://www.digitalbarriers.com/technology/facial-recognition/

This source is the Digital Barriers website. As there is not very much information about their technology, this was one of my most used sources. While it is obviously biased towards them, it provides high quality and detailed information about each of the different areas of facial recognition technology that they provide.

Part C – Reflection

Reflect on one aspect of the research process and explain how it has shaped your thinking and project deliverables. (150 – 200 words)

Research:

I found the research aspect of this task to be quite challenging (in a good way). I thoroughly enjoyed the research I could do and the note taking involved in the introduction of the case study. But I found it increasingly hard to find unique, trustworthy resources the further I got into the task.

The process of finding sources has taught me the value of looking deeper into things, the skill of being able to understand the relevant information and apply it to my assignment.

But one of the main things this process has taught me is the reward of finding a relevant source and the joy of seeing a written project come together. I haven't experienced this in other assignments before but it is such an amazing feeling.

Reflect on one aspect of project management process. Explain how it, or lack thereof, has shaped your project development. (150 – 200 words)

Log Writing

My project management has been extremely poor for this task. I believe that my biggest problem in this was that I did not track my progress by writing logs. I began the task oblivious to the fact I was supposed to be writing logs, because I did not read the task notification clearly and thoroughly. This has meant that I did not set goals or reflect on the process (e.g. what was working and what wasn't).

The consequences of my actions have been that I fell behind in the task and spent time doing things that were not actually useful. As I was not goal setting as part of my project development, I began to set goals out loud to myself but then did not hold myself to these goals (e.g. I'm writing this at 10:30 at night the day before it is due where I really should have started this sooner). This has lead me to severely rush multiple things that I should have allocated more time for, because I thought I had more time to work on them then I actually did.