

10 IST Task 1: Deepfake - Charli Kemper

Part A: Case Study

Introduction

Deepfake is a combination of deep learning and fake, and is an emerging artificial intelligent technology. It is classified as AI because it learns through training to synthesise subjects (typically faces) in images, so it can then make a video combining the movement of one subject, to the appearance of another.

It has recently gained popularity with the rise of deepfake videos on platforms like YouTube, but they are also causing many to be concerned about the impact deepfake could have on individuals and society.

Deepfake was originally created by a professor at the University of Washington called Ryan Georgi, however, fake images and more recently videos have been happening throughout history way before him. An example being in 1939, when King George VI was edited out of an image with the Canadian Prime Minister and the Queen, as it was believed the Prime Minister would look more powerful if he was just with the Queen.



Ryan Georgi

At the moment deepfake is mostly being used for putting celebrities



After and Before

faces on other people's face, but it is also being tested with full body movement with some more advanced programs generating full 3D head positions like head tilts, raised eyebrows and pursed lips. Deepfake videos are improving every day and getting more realistic. Eventually we will get to a point when you will no longer be able to tell whether a video is deepfake or real using just your eyes. This issue of technology vs technology is important, and is going to become a lot more prevalent as this and

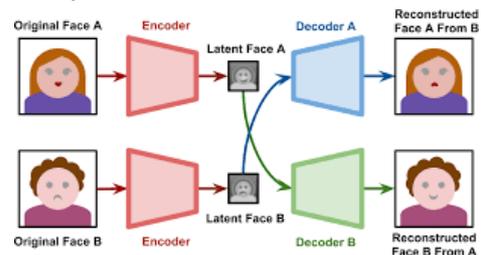
other technologies continue to be used and developed.

Focus Case

Deepfake works by a deep neural network learning to take an input (face/body), compress it down into encoding, then regenerate it to, match a second inputs movement, while still

looking like itself. The best example of this shown in [Everybody Dance Now](#), which despite being obviously fake, is perfect for showing the possibilities of this AI.

Currently deepfake has many limitations. For the deepfake to look realistic, a lot of photos are needed of the subjects in the deepfake. This is why deepfake is most commonly made with celebrity faces, like the

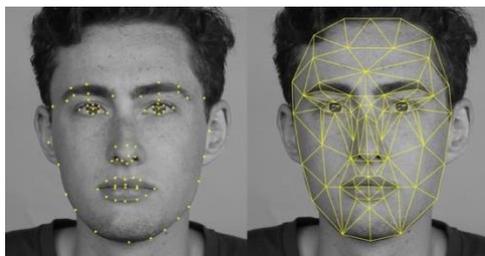


video [Nicolas](#)

[Cage Deepfake Compilation](#), as the internet allows easy access to large quantities of photos of celebrities. This also leads to videos like [You Won't Believe What Obama Says In This Video](#), [Conspiracy Theories with Shane Dawson](#), where deepfake isn't used ethically.

Another limitation of deepfake back/side of heads are harder to mimic, as there are less photos of

someone turned away from the camera, this is known as the photo bias. Another example of the photo bias being, how our eyes are usually open in photos making it harder for the deepfake to replicate closed eyes. Another limitation was its inability to replicate



physiological signals intrinsic to human beings, such as normal breathing or blinking rates, to make us believe the video is of a real person. This causes the technology to evolve, and now deepfake knows to replicate those things, which also shows how quickly this technology is evolving and the videos becoming more realistic.

Analysis

Deepfake had a massive gain in popularity through videos, like the examples above, being spread on platforms like YouTube of celebrities faces put into other types of videos, some that have positive impacts, like laughter and technological progress and others with negative impacts from deepfake not being used ethically. Deepfake has mostly positive impacts on individuals, while mostly negative impacts on society.

The biggest issue with deepfake videos being made of celebrities is that it can spread false information, whether that be what the “celebrity” is doing, planning to do, or just something about them. This is shown in the Obama deepfake video, as if something similar was made of a country's leader, without people knowing it was deepfake, where they said they were going to bomb a place, that place might retaliate because of the false information. This is an extremely negative impact for society as public trust will be destroyed and many arguments between countries could happen as a result of deepfake causing miscommunications.

Deepfake using celebrities faces can make many people laugh, as seeing a celebrity's face on characters in other movies, for the purpose of humour, can be quite funny, especially in the case of woman and men switching faces. The Nicolas Cage video is an example of this positive impact, as it combines widespread online humour with emerging technologies, that gives joy to the individuals who watch it, which has become a new comedy content. Humour is extremely important and highly influences people's overall happiness, and with over 300 million people having depression, having more variety of humour is more important than it would first seem.

Celebrities faces are also being used in deepfake for adult videos, without consent from either party. This can both ruin people's careers and destroy their dignity, but despite these types of deepfake videos being really harmful to the individuals in it, there is nothing they can do, as the law can't keep up. The issue, however, with a law protecting people from situations like this, is how you could enforce a rule like that, especially with deepfake videos getting harder to spot.

Deepfake has been a good force for technological progress and development, as with each issue and limitation that pops up, the technology is further developed and improved. An example of deepfake videos progress in body movement is the video dance video. At the moment you can very clearly tell it's fake, as the subjects movements are unnatural and morphed, but as shown in the focus case, limitations like these are quickly fixed with the constantly evolving technology.

Overall deepfake videos have both negative and positive impacts on individuals and society, whether that be like laughter and displaying technological progress, or the spread of false information and its use in adult videos. The inappropriate use of deepfake as well as the platforms it is shared on, is compromising the privacy of individuals, changing the reliability and accuracy of information, and allowing bias to be. This technology has incredible potential, but we have to make sure that it is used ethically and give protection within the law for those who could be negatively affected by it.

Part B: Conclusion (From The Perspective of Deadpool)

The emerging AI technology known as deepfake should not be developed for various reasons, including the fact that it is being used unethically for adult videos and spreads false information, that leads to more serious consequences, as there are no current laws in place to protect people affected by it.

The most current negative impact being faced at the moment is how deepfake is being used to put celebrities faces in adult videos without either party's consent or knowledge. This is extremely harmful to the individuals involved. The celebrities dignity gets destroyed and their privacy is compromised by being put in an adult video without their knowledge or consent, which in the hands of the media can turn into a big "scandal" story, ruining the celebrities career. Deadpool would be highly affected by this, especially since he is a character often sexualised. Those he was in a relationship with would leave him after believing that he was cheating on them, this would also stop other from even being in a relationship with him in the first place, as many would avoid him based on videos they thought were real. And unfortunately the damage is done despite people knowing that they are deepfakes.

Deepfakes of important or trusted people have the possibility of an extremely negative impact as "they" spread false information, causing minor to major impacts based on who the person in the deepfake is. Say it was an influencer, like Deadpool for example, who was put in a deepfake telling people to do something, or to go somewhere. Anyone who looks up to Deadpool will do what they think "he" is saying. This puts guilt on the influencer despite them not doing anything wrong, and could also put those fans in danger. It gets even worse though, as if a politician or country leader was put in a deepfake video, whatever they are made to say could impact thousands of lives.

In conclusion deepfake should not be developed, as even if you know it's fake, it is and will continue causing negative impacts on both individuals and society, as it is being used unethically in adult videos which is harmful to the individuals involved and it is spreading false information under the disguise of trusted people, which ruins public trust, harming society.

Part C: Reflection

One of the aspects of the research process that shaped my thinking and project deliverables was the note taking strategies as making my notes dot points of information in my own words and sectioning it into what information it gave, helped me both understand the content and make sure to cover everything thing I needed in the rubric.

By changing notes such as "*decent face swaps can be achieved with as few as 300 images, but more makes a more realistic face swap*" to "*for the deepfake to properly work and look realistic, a lot of photos are needed of the subjects in the deepfake*" I was able to copy it straight into my paragraphs, speeding up the overall writing process.

I organised my notes into categories like "*About Deepfake*", "*Deepfake History*" and "*Impacts of deepfake*", which helped me understand the content and find specific quicker. This was positive as it meant I didn't leave anything needed out, but also negative as it made the paragraphs not flow very well, so afterward I had to rearrange certain parts and change words to make it flow better.

One aspect of the research progress that shaped the projects overall development was the progress-tracking and goal-setting as it kept me motivated to keep working and avoid procrastination.

By always writing what I had achieved each day like "*I made the final 2 props, the D.A.R.T product box, and the mini newspaper,*" as at first I was putting off making them because I didn't know how I would, but once I did do it and was able to write down that I had it made me proud and want to do continue doing more keeping me motivated to do work even when I was stuck on something and didn't want to do it.

The goal-setting at first didn't really help my project development, but that was just because I didn't completely understand the week number check list. I thought it was for the school weeks not how many weeks it had been since being given the project. I changed the week numbers to be the school week numbers, as that helped me better keep track of the time frame and what I needed to do to stay on top of the workload and improved my overall time management.

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