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Explore Task Questions- Deepfakes

> ● A computing innovation is an innovation that includes a computer or program code as an integral part of its functionality.
> ● Computing innovations may be physical computing innovations such as Google Glass or self-driving cars, non-physical computer software like a cell phone app, or computing concepts such as ecommerce or social networking which rely on physical transactions conducted on the Internet.

1. What is your computing innovation?

My computing innovation is Deepfakes. Deepfakes are carefully crafted videos and images that mimic somebody talking or saying something. It uses an existing image or video to create a new image that looks like and sounds like somebody else. This is achieved through neural networks, a series of algorithms and networks that are modeled after the human brain.

> ● Purpose means the intended goal or objective of the innovation.
> ● Function means how the innovation works (e.g., consumes and produces data).

2. What is the intended purpose or function?

The intended purpose of Deepfakes is to simulate somebody else saying or doing something that they have not done. This is achieved through the use of neural networks that take data from one image and impose it onto another existing video. It also uses a generative adversarial network also known as GAN. GANs were invented for AI to give machines something like imagination. In Deepfakes, there are two machine learning models that compete to prove the identity of the person in the video. The first model creates the forgeries and the second tries to detect the forgery but fails (Porup).

> ● An effect may be an impact, result, outcome, etc.
> ● Beneficial and/or harmful effects are contextual and interpretive; identification includes both the classification of the effect as beneficial or harmful and justification for that classification.

3. Identify at least one beneficial AND one harmful effect of your computing innovation?

So far, Deepfakes have only been used to put celebrity's faces onto porn stars or mock politicians. Deepfakes so far have shown more harm than good. According to Porup, a senior writer at CSO, Deepfakes make the public nervous and "pose a threat to our democracy" (Porup). Deepfakes pose a huge threat to politicians because now the public could hear a message created by an opposing campaign and not know whether or not it is real. Deepfakes harm the integrity of most people and pose a threat to the truth as we know it. However, according to Charleer, Ph.D. in Data Sciences, Deepfakes could be a good thing for society because it will force people to be more critical and not take everything as truth. In summary, Deepfakes could harm political campaigns and destroy reputations but might improve society's critical abilities to analyze news and internet sources.

Effects need to be related to society, economy, or culture and need to be connected to a group or individuals. Examples include but are not limited to:
o The innovation and impact of social media online access varies in different countries and in different socioeconomic groups (EK 7.4.1A)
o Mobile, wireless, and networked computing have an impact on innovation throughout the world (EK 7.4.1B)
o The global distribution of computing resources raises issues of equity, access and power (EK 7.4.1C)
o Groups and individuals are affected by the "digital divide" (EK 7.4.1D)
o Networks and infrastructure are supported by both commercial and governmental initiatives (EK 7.4.1E)

4. Explain how your identified effect might relate to the economy, society, or culture?

Deepfakes ability to alter political campaigns might change the course of elections. By creating a fake video that can reproduce somebody in a compromised state or saying something that they did not it will decrease public opinion of that person and could change how they are viewed in the public eye. Deepfakes have the ability to destroy anybody's reputation and it would be very difficult for that person to counter or restore their identity.

● Data types include: integers, numbers, Booleans, text, image, video, audio, signals. Data that infer these types like fingerprints, temperature, music, length, pictures, etc. are allowed.
● Data collection devices (e.g. sensors, cameras, etc.) are not data.
● Large data sets include data such as transactions, measurements, texts, sounds, images, and videos.

5. Describe the data that your computing innovation processes.

Deepfakes process images and audio. The primary model of machine learning used in the Deepfake creates the forgery and the second attempts to detect it. If it succeeds, the primary model tries again, until the second cannot detect the forgery. The program also processes audio in order to make it sound like the fake person is saying it. It composes an audio file of what the person sounds like and then mimics that in the fake person's voice.

6. Describe how the data that your computing innovation is consumed, produced, or transformed.

Currently, Deepfakes have been used to compromise celebrities by putting their faces onto porn stars. Deepfakes have also been used to make fun of politicians, especially our current president Trump. The main issue with Deepfakes is the threat they pose to reputations. Deepfakes have the power to destroy relationships by faking scandalous affairs. Due to the fact that the world is consumed by the internet, it will be very difficult to decipher what is real and what is not. The main scandal with Deepfakes in 2019 was a video of Trump giving the Belgian people advice regarding climate change (The Guardian). This video was crafted by a Belgian political party, Socialistische Partij Anders. The scandal caused widespread controversy about both Trump and Deepfakes.

7. Reference at least three sources that you will cite in your Explore responses.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3426174

https://www.theguardian.com/technology/2018/nov/12/deep-fakes-fake-news-truth

https://www.foreignaffairs.com/articles/world/2018-12-11/deepfakes-and-new-disinformation-war

https://towardsdatascience.com/why-deepfakes-are-a-good-thing-10ceb86deaed

https://www.livescience.com/deepfake-ai.html