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The power of Glass given a mere Camera

Wearable technology is the next frontier for mobile devices. This type of technology has always been indicative of a futuristic world in science fiction. As is implied by the name, wearable technology incorporates computer and advanced electronic technologies such as a watches, shoes, glasses, shirts, and other forms of clothing and accessories. The technology giant, Google, has recently distributed prototypes of its new product Google Glass or simply, Glass, to a select group of 8,000 beta testers on 20 February 2013. Computerized eyewear has been around since before the development of Glass, such as Steven Mann's Eyetap, but Glass is the first to be commercially available to the general public. With this commercial availability of computerized eyewear there is a widespread concern of the possible effects Glass may have. With its facial recognition capabilities and ability to secretly record what the user is seeing it is clear to see why Glass raises so many concerns about privacy and other possible violations. This raises the question, should Glass and other possible derivatives include front facing cameras in their design? Despite the benefits introduced by Glass, they cause much more harm. In a Utilitarian analysis it is concluded that they remain an unethical device.

Utilitarianism is a theory in normative ethics that is used to determine the more ethical approach by striving to maximize happiness and reduce suffering. This theory focuses on the consequences of the action rather than its morality. Does the end result cause more happiness than suffering? This is the main question asked in Utilitarian ethical analysis. For example, suppose a city is trying to build a highway through a relatively small neighbourhood. In a utilitarian analysis the city would take into account the level of happiness achieved should the

project be realized as compared to the level of suffering the project would bring about. Perhaps happiness would include the millions of dollars commuters would collectively save and the level of compensation the residents of the neighbourhood would receive. Furthermore, suffering may possibly include loss of animal life and the need for relocation of the neighbourhood residents. A conclusion is then drawn by determining whether the scenario cause more good than harm.

Glass is computerized eyewear that displays information on the top right hand corner of the user's field of vision. It has wide range of functions, allowing users to access a wide range of information through the use of simple gestures such as winking, swiping or looking around, as well as through commands such as "Okay Glass, Take a picture." Glass has many practical uses such as: allowing one to translate speech almost instantaneously; watching videos; and getting directions. Apart from the display, many of the features of Glass can be found on a smart phone through the use of Google Now, yet there still remain some key differences between the two technologies. The major difference between the smart phone and Glass is the introduction of augmented reality (AR) and feedback loops. AR is a live, direct or indirect, view of a real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. AR has an extensive range of applications such as: improved sight to some visually impaired; safer eyewear for workers such as welders; and exaggerated images that allow users to see what the naked eye cannot, such as slight color changes on a person's skin when blood is pumped. Feedback loops are another exciting ability of Glass. Feedback loops are continuous streams of real time data such as telling someone how fast they are running or how many calories are in the food one is about to eat.

The idea behind feedback loops is that by providing a person with a constant stream of real time data they can easily see the more immediate effects of their decisions and behaviour. According to my interview, feedback loops have been shown to have a powerful influence on people's decisions and behaviour such as reducing traffic accidents by up to 14% in one case where a feedback loop was used to display a driver's speed in contrast to the speed limit. Glass also has the ability to incorporate facial recognition software. Facial recognition is the use of software to identify someone through the use of still images by attempting to find a match of their calculated facial structure in a database of facial structures. So far, Google has prohibited developers from developing applications with facial recognition, however Glass and/or later derivatives may inevitably implement this software. Privacy laws vary from region to region, but generally video filmed in public areas can broadcast anyone's face since no one has any exception of privacy in a public domain. Glass is a truly revolutionary piece of technology. This device is paving the way for even more sophisticated derivatives that are smaller, more integrated and more inconspicuous.

With a mere front facing camera in its design, Glass has managed to raise a series of concerns and anticipations. The device is both beneficial and detrimental, which is why a Utilitarian analysis is most appropriate. Glass allows its users to capture or stream video online hands free in a first person view. Videos have proven to be powerful educational tools especially when coupled with the use of a video sharing site such as YouTube. Being able to capture or stream video with Glass could potentially push the boundaries of demonstrative and educational videos. Presumably, a surgeon could stream a live surgery to class of students. Along with the hands free first person video capturing, comes the concerns of privacy. Privacy

has been a large concern for people ever since smart phones made it so easy to capture video or images and share them online. With its ability to covertly record others, Glass is quickly being seen as a major threat to privacy. Glass incorporates so many features; someone cannot be accused of recording or spying simply because they are wearing the device as opposed to someone blatantly recording with a video camera or even their phone. Conceivably, Glass users may be more likely to spy on people given that the ability is so readily available. People fear that someone may glance at their credit card and record their personal information, or perhaps they fear that their conversation is being recorded. On 1 July 2012, Steve Mann, the inventor of EyeTap, was physically assaulted by some of the employees in a McDonald's in Paris. According to Mann the assailants were feeling uncomfortable around his EyeTap device. He tried to explain the device to them as well as, show them the documentation that accompanies the device. The employees remained uncomfortable and then proceeded to try to forcibly remove the, tightly secured, EyeTap device from Mann. Despite the educational benefits the camera would provide it would ultimately result in more harm than good. There are too many issues with privacy, notably expressed in Mann's McDonald's experience.

Another concern with Glass is the possible implementation of facial recognition. Facial recognition is a very probable feature that Glass could implement, however Google has so prohibited the development of applications with facial recognition. If facial recognition were ever to be implemented in Glass or other derivatives, there would be a plethora of privacy concerns. Hypothetically one could scan through a crowd and locate any one they wish. One could potentially look at someone and scan the internet for their identity and any other available information, images, and videos. This feature would raise the issues of stalking and

identity theft. In other scenarios, facial recognition could prove beneficial in terms of increased security. The technology could assist police officers in locating a known criminal. The device could also point out friends or people in need of assistance. Although facial recognition may prove beneficial in some instances there is too much risk for it to be safely implemented. Therefore, facial recognition is detrimental and Google is correct in prohibiting its use. It is important to note that modifying Glass to support facial recognition is not outside the realm of possibility and probability.

AR is one of the most exciting features Glass is introducing. This feature could potentially allow people to analyze what they are looking at by identifying it and retrieving relevant information. The device could provide the information directly beside the physical object one is looking at. Suppose a scenario where the device alerts a person with a clogged artery that they have had too much cholesterol for that day, this would contribute to a healthier society. It can allow the user to see what the naked human eye cannot such as exaggerating slight color variations frame by frame in videos. Apart from medical and educational applications, AR most notably allows for a significant increase in user interactivity. This could result in more interactive applications and GUI. AR is a truly remarkable concept with an extensive range of application.

The topic of Glass is very relevant to society since it encircles social media and social interactions. Glass has the potential to change the way we interact with each other. Face to face interaction may become two people scanning each other and retrieving information. The device can potentially change the way we access information and communicate with one and

other. Conceivably we could end language barriers with the use of instant speech translations. Like smart phones, Glass is making it even easier for others to share and collaborate. Be if fear or acceptance, Glass has an undeniable impact on our society.

Should Glass and other derivatives have front facing cameras in their design? In a Utilitarian analysis it would be unethical since the front facing camera causes more harm than happiness. Despite the educational and medical benefits of Glass the risk of privacy violations and identity theft are too high. Society and privacy law is not sufficiently prepared for a camera in Glass's, and other possible derivatives', design. There is no doubt that the camera could provide a lot of benefit, however there must be extensive development of AR, privacy law, and general safety of facial recognition before Google decides to include a camera in their product's design. Without the camera, Glass would still remain a remarkable product with a large impact to society.

Refernces:

A discussion on how wearable technologies like Google Glass can serve as feedback loops that have a powerful effect on behaviour:

 http://gigaom.com/2013/06/15/with-wearable-tech-like-google-glass-human-behavior-is-now-a-design-problem/

A description of Google Glass and its features. :

http://www.google.com/glass/start/

Privacy Commissioner of Canada Jennifer Stoddart and 36 of her provincial and international counterparts' letter to Google raising the questions of privacy.

http://www.priv.gc.ca/media/nr-c/2013/nr-c_130618_e.asp

General overview for potential Glass developers

https://developers.google.com/glass/overview

Using amplified motion with Google Glass and Virtual Reality

http://dirrogate.com/making-the-invisible-visible-with-a-wizer-click-to-read/

Live surgery stream with Google Glass

http://www.reddit.com/r/technology/comments/1llnww/doc_uses_google_glass_to_livestream_surgery_a/

A recount of the assault of Steve Mann

http://eyetap.blogspot.ca/2012/07/physical-assault-by-mcdonalds-for.html