Jeff Guo

CS 428

Overview of HoloLens 2

As the current situation has pushed us towards work from home, many of the professional workers are finding it difficult to communicate, collaborate, and complete the work they are assigned. Some might believe that just upgrading computers or providing mics and webcam to employees could solve many of the issues and that might be true for some professions – such as computers or business professionals. What about other professions that required to be outside? Professionals like structure engineers that need to be outside with many other engineers to discuss and communicate issues that might come up during their work so even if we provide them with the latest computer hardware it might be useless to them. This does not mean there are no other ways around this issue. The technology that the Microsoft team created – HoloLens 2 – is developed and designed for people that are in such a field.

HoloLens 2 in the updated version of the first HoloLens which was not commercially available. The upgrade includes better display resolution, a larger field of view, upgraded security, and a faster processing unit. The HoloLens 2 is an augmented reality headset that allows one to fully interact with augmented objects. It is a stand-alone technology that does not need to be tethered to the computer which allows the user to fully move around their space. It also supports voice commands, sophisticated gesture control, full hand tracking, biometric security, and eye-tracking technology. This is a device that fully enhances and brings out what augmented reality can be and should be. With that being said it is also currently not a device for everyone.

The upgraded HoloLens – HoloLens 2 – has introduced new features such as gesture support that allows one to easily interact with the augmented objects. It allows the user to drag and drop, tapping, and interact with the menu. This allows ones to custom scale the object as large as they needed to present or alter their ideas without needing to connect the device to the computer to rescale. It also has new features such as 3D eye-tracking which was not available on the first HoloLens. This feature allows users to perceive the augmented reality much more realistically and provides an alternative security method – iris recognition. With all these detailed features it allowed the HoloLens 2 to be a device that can fully (close to fully) bring out what augmented reality can do. One of the famous/popular augmented applications was a game, Pokémon Go, and even if many people find it as a very addicting game, it is not a great representation of what augmented reality can do. The only augmented about the game is to combine the Pokémon with the reality, essentially placing the object on top of the video feed from your phone. I would say that it is a stretch to consider it as an augmented reality when it barely touched the surface of what augmented reality can do. Unlike Pokémon Go, HoloLens 2 is one of the few devices that can fully come close to how we can change our lives with augmented reality.

HoloLens 2 allows users to fully create, design, alter, develop, and learn using augmented reality. It allows engineers to create structures out of blueprints before building the structure. This gives the engineer an idea of what issues could happen before executing the plan. HoloLens 2 also allows the designer to design and alter the look of certain work on the go. For example, changing out the exterior structure of a prototype car can be as simple as tapping and replacing using the gesture support that HoloLens 2 have. This could also be a way for developers to develop new ideas by piecing things together in real-time. For example, game developers or level designers can drag and drop assets that the modeling team created and place it exactly where the

object should be in the game world. It could allow the developer to experience the world that they created without needing to be confined into space like virtual reality. The reason I say learn is that this technology will eventually make its way to the educational programs. As of right now, some programs use this to teach such as medical programs using it to teach new doctors in real-time on patients that are going through surgery. The reason why we have not seen many other education programs using this technology is due to the cost of the device. Three-thousand-five-hundred dollars per HoloLens 2.

Due to the high cost of these devices, the intended user is in the top positions or in professions that could not use normal computers to replace their work. This even means for regular programmers these devices are not intended for them unless they are writing applications for the HoloLens. The users that benefit the most are more likely researchers, scientists, or engineers that require to see structures physically. All three fields have one thing in common that is they require a unique way to solve and explore issues that a normal computing device cannot do easily. They need a way to easily allow them to use gesture control to alter, manipulate, and interact with the data they have. Similar to how the NASA team used the CAVE2. The only difference between CAVE2 and HoloLens is that I did not allow the same interaction capabilities that HoloLens can provide.

This brings us to the cons of HoloLens 2. As mentioned above, the cost of these types of devices is not cheap. The starting price is three-thousand-five-hundred dollars and if users want more features such as holoportation then they must consider the cost of multiple cameras and other required technologies. Obviously, one headset is not enough to be used to collaborate and two might be too few to be used for team projects. So, as you see this can easily cost over ten-thousand dollars just to be used for a team project. This is also the reason why we do not see

many educational programs investing in these devices for learning. Even if they do have the money to invest in these devices the speed of technological growth is so fast that it is not a good investment for them to consider. Other cons are more related to the maturity of the technology. This is only the second generation of HoloLens, the feature that I have mentioned might seems great but there are many bugs and issues that can cause the device to be unusable in some situations. Therefore, unless the price is much lower – possibly around one-third of the current price – then the investment into these devices is not recommended.

With the cons being mentioned there are pros that we should not forget. Even if the cost is high and the technological maturity is low the HoloLens 2 can bring great advantages to professions that benefit the most with it. Especially with the current situation, we are in, it is better to have something that works seventy-five percent of the time than having nothing to work with. Also, these devices are constantly being updated and patched by a large corporation – Microsoft – so users do not have to worry about the project being stopped and getting obsolete after a couple of years compared to start-up projects that are often dropped due to lack of funding. Another major advantage is what it brings to the market and the impact it has on augmented reality to our lives. With people starting to see the advantages of using HoloLens 2 the market will begin to slowly introduce competition which drives the technological advancement in this field, therefore, in the end benefiting the consumers and hopefully driving the cost down. We already begin to see it with the introduction of LiDAR on the iPhone 12 Pro by Apple. It might not be using the augmented reality the same way as HoloLens 2, but it is a step towards competition. Without the introduction of HoloLens, many people will not understand the importance of using augmented reality and even if they do understand, without the HoloLens very few people will have the ability to develop and interact with augmented reality at this level.

In conclusion, HoloLens 2 is a device that not only aims at professionals but also is a device that will pioneer the future of augmented reality uses. Imagine a future where students can learn from anywhere (with the help of holoportation), a place where the widest structure can be safely created before a large amount of money is invested, a time where the distance between a company and employee is no longer an issue, and a future where people around the world can collaborate efficiently (with the help of AI neural TTS).