

2a) The computing innovation that is represented by the computational artifact is the Microsoft HoloLens. The intended purpose of the device is to produce holograms in the environment that the user is using and allow the user to see and interact with the hologram like a real-world object [2]. The computational artifact illustrates the purpose by showing the Microsoft HoloLens first scans the user's environment by using its cameras and sensors, then the device will produce a realistic 3D hologram that the user can interact with.

2b) The artifact was created with Paint 3D and PowerPoint. I first inserted a 3D model of the Microsoft HoloLens by using PowerPoint's insert 3D models feature. Then I used Paint 3D to insert 3D model of a person by using Paint 3D's database of 3D models. I then modified the person by changing the arm. Then I export the person into PowerPoint and added text, shapes, and more 3D models like the heart into the slides. I then animated the 3D models and shapes and added transitions to the slides. Lastly, I converted the PowerPoint to a .mp4 video format.

2c) The Microsoft HoloLens have many benefits. One benefit that the device can bring is that it can change how our society design cars and other products. According to Tom Warren from the Verge, car manufacturers like Ford are using the Microsoft HoloLens to "let designers quickly model out changes to cars" without the need of creating another clay model of the car. This allows car designers to immediately see the changes they have made and can potentially speed up the design process [6]. Another benefit it can change how our society learns. The device can allow students to see how the body works with 3D organ models and allows them to interact with the model [3]. However, with all that benefits, one of the harmful effect on society is gaming addiction. The Microsoft HoloLens allows you to play games like Minecraft on the device, making you feel like you are in the game with realistic holograms. However, Nick Summers, a reporter for Engadget who played Minecraft on the Microsoft HoloLens, described his gaming experience as "HoloLens can create unique and breathtaking experiences. Once I had my Minecraft world on the table, I didn't want to take it off" [5]. The fact that the Microsoft HoloLens can make the gaming experience so realistic can be a problem in the society as users of the Microsoft HoloLens can be addicted to it.

2d) The Microsoft HoloLens inputs data by using different types of cameras, microphones, and a light sensor [7]. Then, the Holographic Processing Unit and Central Processing Unit takes in the data captured by the cameras, microphones, light sensor and transforms those data by projecting images onto the lens in the correct position in the device, creating the realistic 3D holographic image that the users see [1]. One of the data security concern is that the data captured by the cameras and the sensors may be altered by a malicious program on the device, making the device's Central Processing Unit and Holographic Processing Unit output realistic altered holographic images like a huge insect to suddenly scare the user and altering human facial features with holograms tricking the user into identifying people incorrectly when wearing the device [4].

2e) References

- [1] Charara, Sophie. "Microsoft HoloLens: Everything You Need to Know about the \$3,000 AR Headset." *Wareable*. Wareable, 20 May 2017. Web. 10 Apr. 2018. <<https://www.wareable.com/ar/microsoft-hololens-everything-you-need-to-know-about-the-futuristic-ar-headset-735>>.
- [2] Laukkonen, Jeremy. "HoloLens: A Look at Microsoft's Mixed Reality Headset." *Lifewire*. Lifewire, 25 Jan. 2018. Web. 10 Apr. 2018. <<https://www.lifewire.com/hololens-4157920>>.
- [3] Lubinger, Bill, and Janice Guhl Hammer. "Case Western Reserve, Cleveland Clinic Collaborate with Microsoft on 'Earth-Shattering' Mixed-Reality Technology for Education." *Case Western Reserve University - Research News*. Case Western Reserve University, 29 Apr. 2015. Web. 11 Apr. 2018. <http://case.edu/hololens/?nw_view=1524058885>.
- [4] Roesner, Franziska. "Who Is Thinking about Security and Privacy for Augmented Reality?" *MIT Technology Review*. MIT Technology Review, 19 Oct. 2017. Web. 12 Apr. 2018. <<https://www.technologyreview.com/s/609143/who-is-thinking-about-security-and-privacy-for-augmented-reality/>>.
- [5] Summers, Nick. "I Played 'Minecraft' with Microsoft's HoloLens." *Engadget*. Oath Tech Network Aol Tech, 8 July 2015. Web. 12 Apr. 2018. <<https://www.engadget.com/2015/07/08/minecraft-hololens-minecon/>>.
- [6] Warren, Tom. "Ford Is Using Microsoft's HoloLens to Design Cars in Augmented Reality." *The Verge*. Vox Media, 21 Sept. 2017. Web. 10 Apr. 2018. <<https://www.theverge.com/2017/9/21/16343354/microsoft-hololens-ford-augmented-reality>>.
- [7] Zeller, Matt, and Brandon Bray. "HoloLens Hardware Details." *Mixed Reality | Microsoft Docs*. Microsoft, 21 Mar. 2018. Web. 10 Apr. 2018. <<https://docs.microsoft.com/en-us/windows/mixed-reality/hololens-hardware-details>>.

Sources used in the Computational Artifact

Chupacabra, Bacon. "Minecraft Oasis." *Remix 3D*. Microsoft, 23 Mar. 2017. Web. 19 Apr. 2018.

<<https://www.remix3d.com/details/G009SWG76WWK?section=mincraft>>.

Microsoft. "Chalkboard." *Remix 3D*. Microsoft, 28 Nov. 2016. Web. 13 Apr. 2018.

<<https://www.remix3d.com/details/G009SWXWBJF1?section=remixes>>.

Microsoft. "HoloLens." *Remix 3D*. Microsoft, 30 Oct. 2017. Web. 13 Apr. 2018.

<<https://www.remix3d.com/details/G009SX66Q3Z5?section=remixes>>.

Microsoft. "Human Heart." *Remix 3D*. Microsoft, 12 Dec. 2017. Web. 13 Apr. 2018.

<<https://www.remix3d.com/details/G009SVN05LMF?section=remixes>>.

Xbox. "Avatar Male." *Remix 3D*. Microsoft, 8 Sept. 2016. Web. 19 Apr. 2018.

<<https://www.remix3d.com/details/G009SX0N1B4H?section=remixes>>.