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The Holodeck: The Future of Artificial Reality

The technological advances we have made throughout our history have been, to put it simply, incredible. The difference between even just computers, from when I was a kid compared with what they are today, is incredibly vast. Many people try to predict how our technology will further progress. There are a multitude of film productions that have attempted to create versions of the future, what our world might become and technology that we might have created. Some of the creative representations are seemingly ridiculous and made to be so. Many dated films depict futures that have now come to pass and prove that the world didn’t, in fact, become what they predicted. This would include films like Back to the Future where the world of 2015 included flying cars, kids on hoverboards, and self-drying jackets.

Then we have shows like Star Trek, first airing in the 1960’s. Although this show is set in the future, even hundreds of years past today, a lot of the technology they portrayed has already been invented, such as mobile communicators, handheld tablet computers, earpieces, and voice recognition. These are all things that, today, we take for granted. There are still things that we have yet to come even close to inventing, including androids, warp drive, dermal regenerators, and much more. However, there is one Trek design that we may actually be well on our way to developing, the holodeck.

The holodeck is a room containing a simulated, alternative version of reality where people could enter and interact with whatever environment the holodeck was programmed to display. In the show, the holodeck is used for entertainment purposes, training simulations, and even as an aid in forensic investigation by recreating crime scenes. Something like this could be very usable in our world for these same reasons (“Holodeck”). For example, today’s military already uses computer-based simulators for training purposes, mostly for vehicle training, but very little exists to train soldiers in the decisions they have to make in the difficult situations they are being trained for (Hill et al.)

So far, the closest we have come to the holodeck would be products that feature virtual reality or augmented reality. In virtual reality, a computer generated environment that includes images and sound is used to simulate a user’s physical presence in this environment, which you can experience through headsets like the Oculus Rift. Augmented reality is when computer generated images are superimposed onto a user’s view of reality, which you can experience in products like Pokémon Go or Google Glass (Jackson; “Introducing Virtual Environments”). However, both technologies still present problems that prevent them from being on the same level as the holodeck. The virtual reality products of today require a level of isolation that prevents users from interacting with the generated environment in a way that feels natural. Augmented reality doesn’t involve the creation of a completely new world apart from reality and it is also limited in its field of view. The software that lets the virtual and real worlds interact believably and naturally still needs work.

To create a realistic interpretation of the holodeck, we would need extremely advanced technology for sensing human actions. Our technology has already advanced in this area as we develop things like Apple’s [Siri](http://www.apple.com/au/ios/siri/), Google’s [Assistant](https://assistant.google.com/) and Microsoft’s [Cortana](https://www.microsoft.com/en/mobile/experiences/cortana/), which utilize advanced speech recognition and language translation. We also are developing technology for tracking human movements, such as Microsoft Kinect. Many cell phones now include apps that can sense things like temperature, acceleration, and pressure.

One of the most important things for the holodeck would be developing sophisticated artificial intelligence to create realistic virtual characters. Advances in teaching machines how to learn are evident in things like automated game playing, automated car driving and drone control, and deep learning. However, we still have a long ways to go to create an artificial intelligence that is like that of humans. An artificial intelligence that can realistically mimic a human would be necessary to create a true holodeck experience.

Lastly, of course computer graphics would be essential in creating a fully immersive, realistic environment for users. We have already made incredible advances in this area as many modern films and video games showcase. Computer graphic technology advanced enough to be used in a holodeck does not seem far in our future.

The VR and AR headsets advanced enough to make a holodeck-like experience could be available in possibly five to ten years, but the idea of creating this same experience without the use of a headset at all seems almost impossible. Breakthroughs in artificial intelligence are predicted for the year 2040, increasing the possibility of a true holodeck experience in the future (Armstrong). With that in mind, it seems likely that we will one day be able to experience something at least similar to the amazing Star Trek creation.

My opinion is that we are probably still a long way off from creating something as advanced as the holodeck. We are still a long way off from being able to create something as believable and immersive. Although the headsets we have for experiencing virtual reality create a quality illusion of a 3D environment, to compare to the holodeck we would need to create something more like a hologram. We would need to create an environment where a headset was not necessary. Also essential would be creating an environment that you could feel, smell, and taste rather than just see and hear (Krauss). The most impossible form of technology used in the holodeck is the idea that some of the matter created by the holodeck is actually real and can be used or consumed and stays the same when leaving the holodeck.

To summarize, creating the holodeck is not yet possible with today’s technology. The main things we lack are the ability to sense human actions, artificial intelligence, and quality computer graphics. To be able to recreate the iconic Star Trek holodeck we would need further technological advancement in these areas. Although we can’t be absolutely sure whether or not this will ever be possible, the huge progress we have already made suggests that it may someday be possible.

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