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Emerging Opportunities in Collaboration

and Education through Augmented Reality

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Research Paper for NMD 211 Fall 2019

Abstract:

In the current state of society, new technologies are rapidly being created and old ones
are being forced to change or become another part of history. This has been especially true since
the beginning of the twenty-first century, and we've since a giant spike in newly developing
technologies and an increase in the markets which demand them. Now are entering an age where
advanced technologies like the internet, virtual reality, and augmented reality are becoming
intertwined with our everyday lives, and completely changing the ways we socialize, eat, sleep,
and work. In the workplace specifically, these technologies are helping businesses and other
groups make giant strides, mainly by simplifying communication. The development of cell
phones eventually leading to the widespread possession of smartphones has had a massive effect

on the simplicity of communication. When used effectively, this can be an incredible tool for any business or group, and truly shows how important communication really is. Augmented Reality is providing the next step into more advanced communication between individuals, and could perhaps create an opportunity for more effective, and interpersonal communication and collaboration in the workplace.

Keywords: Augmented, Reality, Collaboration, Virtual

Introduction:

Augmented Reality is a rather old concept, which started in 1957 when a cinematographer wanted to take his craft a step further to create a 4D experience for the viewers. It's been a long-developing idea and helped contribute to the invention of virtual reality. Now, we have reached the point where nearly everyone in the world has a smartphone which is capable of AR use on a daily basis. The opportunities of this technology are becoming so abundant that it's being used in pretty much every field of work from medical, to the military, to design, to construction. Though, the larger strides being made in this technology are for the fields that have or require collaboration or education. Companies and other groups are looking now more than ever for ways to effectively connect members of these teams by allowing them to share and mutually interact with data in a commonly distributed workspace, otherwise known as an ARC,

or "Augmented Reality Center"(2). Because of this, there has been a large increase in the interest upon the use of distributed systems technologies that support "multiuser distributed 3D visualization"(1). On top of this, more complex issues like the economy, and politics added to the demand for distributed work environments.

Body:

Twnkls is a company from the Netherlands making large strides in developing AR environments which that can increase the effectiveness of digital collaboration in many different ways. One steps their working towards is working towards more realistic 3D imagery, they claim "By translating the workings of complex technology into a more easily understandable realistic 3D image, abstract theory transforms into concrete insight right before your eyes"(6) Potentially Twnkl's biggest contribution to AR, as far as I know, is a software they've developed with Microsofts Hololens 2 called Vuforia. Vuforia was created to help with collaboration and education in many different fields, Vurfioria Expert Capture, Chalk, and Studio are the different applications which this new AR technology is being applied to. Vuforia Expert Capture was mainly created for work in

warehouses or other industrial settings. This is a very useful application of AR in the workplace because most workplaces in this field are going to be run in a very systematic way, yet the machines being used for production are going to be constantly evolving. This application can help keep all users or staff up to date on any information which could be changing, which in turn would maximize productivity. Chalk is quite similar, but more focused on a variety of fields which all require some sort of technician. The studio takes quite a different approach and is more of a design based AR application, which focuses on using IoT data to be translated and quickly and easily accessible. All of these applications are pushing the limits for information to be exchanged and easily understood between two individuals, no matter the distance.

Other new applications are being developed and starting to emerge which are capable of doing similar things with AR but in the medical field. The application NextMed for android an IOS, uses AR and a headset like the Microsoft Hololens to create 3D maps of bones, organs, or anything which could be useful to the
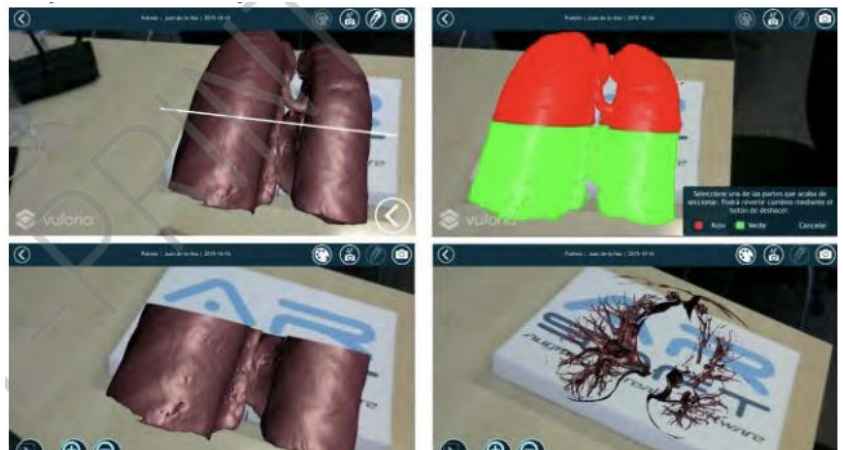
surgeon. This application will likely be useful to surgeons, as it will provide a three-dimensional guide or map of whatever they could be working on, without adding risk with the patient. "With this technology, we can place the virtual elements of the system in the real world and achieve a lighter interaction using our own hands. This implies that the surgeon may be working in the operating room with glasses and place, simply with manual gestures, different contents around

the patient: the 3D model of the anatomical area undergoing surgery, medical images, results of the pre-surgical study carried out... This interaction capacity is very important to avoid any kind of contamination, as it is not necessary to manipulate any computer or tablet."(2) This device also provides an opportunity for education in a much safer environment. It can provide an extra bridge between 2D visualization and hands-on experience for a surgeon, which could be crucial for some.

Conclusion:

The future of AR only keeps expanding in different directions, as it becomes seemingly more possible to do what once seemed like impossible things. Though a certain moral contradiction only grows with the constant development of this technology. That contradiction lies in our understanding of reality itself, and it is presented when we are able to augment or virtualize a reality that is able to stimulate all human senses no differently than our current reality does. This point is now starting to seem more and more realistic, which may call for a reconsideration of how we as humans define our reality, and what the word "real" truly means.

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