Virtual Reality: From Virtual to Reality

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Abstract. Virtual reality has been for several years a developing topic, gradually captivating the publics' attention, more specifically later around the 90s until the point it had to be reinvented since its popularity led to a higher level of public expectations regarding this technology. This ability to experience several realities separated from the real world allowing people to distance themselves from the world seamlessly resembling the feeling of escape and liberation caused by drugs, alcohol, etc. This technology has so much potential for several areas like the Gaming industry, Education, Military, Health applications, Design, Architecture, between many others. And given the developments regarding mobile devices' technologies it is quite common to use mobile devices along with this technology adding an extra value to it. [VRI] [Sch] [VRWa] [VRA] [VRS]

1 Introduction

The concept of virtual reality has been around for quite some years, tracing back to before the 50s. Some works of fiction included traces of what we now know as Virtual Reality long before the technology came to life. Around the 90s the hype around virtual reality had grown tremendously and the words "virtual reality" shifted swiftly from mouth to mouth. Many companies attempted and failed to make virtual reality real by developing devices that can support this technology, but the high level of public expectations was outweighed by the limitations in technology by that time. By the mid 90s the VR industry stopped entirely for a while. Then later on, in the late 20th century, the first VR headsets began to appear, namely the Oculus Rift's bulky headset despite still being quite "computationally demanding". [VRI] [VRWa] [VRS]

To imagine the way technology has evolved so far, how we would be using mobile devices today a decade ago would be near impossible. The increasing capabilities regarding mobile devices led to the broadening of the Virtual Reality market creating new possibilities and new interactions with mobile devices that can be processed via screen interaction and sensor interaction (GPS, gyroscope, etc). [MLRBO]

Fig. 1. Oculus Rift Headset

2 Virtual Reality

Unlike Augmented Reality in which the technology aims to just blend the virtual world with real life interacting virtual components in the real world being able to distinguish both worlds, Virtual Reality is a type of technology which creates an entirely new virtual environment where it is hard to distinguish what is real and what is not making it possible to recreate sensory experiences using all of the 5 senses, by the use of head-mounted displays (HMD), glasses or other devices like smartphones. [McK14] [VRS]

Both kinds of technology (VR and AR) are identical in their goal to immerse the user in the experience even though they do it in different ways. VR users are just more isolated from the real world while experiencing a completely constructed virtual world.

The Virtual Reality concept still continues to intrigue people and generates expectations beyond the technical limitations which lead to misunderstandings about what this technology really is.

3 Kinds of Virtual Reality

There are several kinds of Virtual Reality. An example of one of the most basic kinds of VR is a simple 3D image that may be explored interactively using any computer moving the content around dynamically. Another kind of VR might be the use of display screens, computers and other devices like joysticks, data gloves and others. One can also integrate the use of smartphones in this technology making it also available in the mobile market. [VRWb] [Rou15] [VRWa]

One can simulate real environments, real life situations for the purpose of training or education or one can develop a "fabricated" environment in order to run a game and experience some kinds of interactive environments.

4 Fields/Areas that benefit from VR

this technology can help improve quite a lot of areas like the healthcare sector, education, architecture, the military, sports, arts, entertainment like, for instance, the movie industry, the gaming industry sector, social networking, amongst others. [VRWb]

The areas where the physical risk is quite high greatly benefit from this technology allowing a safe alternative to develop ones' skills in such areas, for instance simulated practice tasks for surgeons, or simulated practice exercises for military personnel. It can also be used to treat patients that suffer from some kinds of mental disorders improving the recovery process. The gaming industry is one of the most important markets for this technology, becoming more and more immersive involving a more physically engaging experience in whole new virtual environments. [KE] [D.14] [Dec14]

5 Pros & Cons

This technology has almost as many positive aspects as it has negative ones. Regarding the positive aspects, there are quite a number of areas/fields that benefit from this technology by training professionals in the best possible way eliminating most or all of the risk and maximizing the results. It gives users the innovative experience to observe and interact with things in such a way, otherwise impossible in real life, like they were there, it can improve peoples' health in the healthcare branch. People with some kinds of handicaps can enjoy vast and beautiful virtual worlds despite their disabilities. One can obtain immediate real-time feedback on the activities being done. [KE] [D.14] [Dec14]

One of the major important issues about this technology is the price of all of the hardware/equipment necessary. The VR technology is in the market for a short period of time thus not quite fully integrated in the different existing markets. It may cause motion sickness if VR headsets are used, or create some sort of addiction for this technology because of its tendency to dim the boundaries that separate ourselves and the virtual worlds from the real world outside. In the future there may be some privacy issues because the equipments are vulnerable to hackers. The lack of proper laws regarding this technology may be a problem due to its fast paced evolution. As the technology is still on its first steps it still presents several flaws that will have to be addressed. [KE] [D.14] [Dec14]

Fig. 2. Virtual Reality immersion

6 Conclusion

Virtual Reality is still a new technology giving its first steps onto the future, representing a different concept than that of Augmented Reality, it shows great promise in the future being constantly improved and evolving rapidly. All the kinds of VR are important and can greatly benefit quite a big amount of areas/fields, despite its negative aspects, it presents a growing number of positive aspects that make this a very useful and successful technology. Both Augmented Reality and Virtual Reality will thrive in the near future, even though they have different kinds of applications, and mobile phones and all other kinds of mobile devices will have an important part on this kind of technology.

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