Sixth Sense Technology: Advances in HCI as We Approach 2020

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ABSTRACT

This paper discusses recent and unique inventions in Human Computer Interaction (HCI). To that end, firstly the authors discuss the Sixth Sense Technology. This technology allows users to interact with virtual objects in the real world in a unique manner. It has a number of applications which are further discussed. Then the opportunities and challenges are discussed. Most importantly, a list of inventions in fields of Augmented Reality (AR) and Virtual Reality (VR) in the recent years are discussed, grouped and compared. These include the smart eye glasses, VR headsets, smart watches, and more. Future implications of all those technologies are brought into light considering the new advancements in software and hardware designs. Recommendations are highlighted for future inventions.

KEYWORDS

Artificial Intelligence, Augmented Reality, Computer Vision, Gesture Recognition, Human-Computer Interaction, Image Processing, Machine Learning, Mixed Reality, Technology, Virtual Reality

INTRODUCTION

“Technology can become the ‘wings’ that will allow the educational world to fly farther and faster than ever before – if we allow it” – Jenny Arledge. Indeed, technology allows us to fly higher in the sky and look over the entire land and beyond. Technological inventions invaded our lives drastically. People spend much of their time either on their mobile phones, tablets or laptop screens. We are often unaware how these devices have become an integral part of our lives, until a mobile phone is lost or a laptop stops running. However, many positive aspects are associated with this technological invasion. Technology is a tool that helped improve the quality of human life. Out of the many technological inventions, one such is the so-called Sixth Sense Technology. This latter, though not yet released into market, can impact our lives by providing a better and more natural interaction (Gupta & Shahid, 2011; Poongodi, 2012). Similarly, the world has seen a number of inventions in the last two decades, which unlike Sixth Sense, have been released into the market (Streitz, Tandler, Müller-Tomfelde & Konomi, 2001). Hence, many questions can be asked here. First, what is this Sixth Sense Technology? What are other recent inventions in the world of Human Computer Interaction? Can Sixth Sense be introduced into our lives in the near future? Of all the innovations, what is the topmost innovation that surpasses all others? These questions will be answered at the end of this paper.

This paper first explains the Sixth Sense Technology in detail, including its setup, list of applications, review by other researchers, and future potentials and challenges. Then, a list of recent
inventions is named and discussed, namely those between in the period of 2012 to 2017. Other relevant terms are discussed as well like Machine Learning and Artificial Intelligence. Next, the different inventions are categorised and compared. Lastly, insight into the future of such technologies is discussed.

**SIXTH SENSE TECHNOLOGY**

**Review**

Reviews on the Sixth Sense Technology were mostly positive upon its introduction in media. Arora (2012) described the Sixth Sense Technology as that which upon emergence into market may lead to evolvement of new devices and hence new markets. It could be a big help to people with special needs or could help control machineries in industries, as suggested by the author. However, the author concludes that security threats and other issues are yet to be considered when releasing this technology. In a different review, the authors suggested combining the concepts of Augmented Reality and Sixth Sense in order to come up with new and better gadgets that allow humans to be machine-free (Raghupatruni, Nasam & Lingam, 2013). As they mentioned in their paper, “With the advent of sixth sense technology, if it can have its roots into all the fields we can expect things to happen in a much better way” (p. 39). They explain in detail the implementation steps of Sixth Sense Technology in schools and show how time spent in performing tasks is reduced significantly in places like exams and libraries. On the other hand, they explain how some issues are to be tackled with like cost and security threats when implementing this new technology in public places. Singh (2015) conducted his dissertation work on Sixth Sense Technology. In his work, he brought into light the different uses of this technology. It is unique, as mentioned by the author, in the fact that a Sixth Sense Device allows computing and task performing on any nearby surface. However, he also brought into light the challenges that stand as a wall blocking the full implementation of the discussed technology, like security and health concerns, and hardware improvement of the Sixth Sense device. Overall, though many researchers who found the technology of Sixth Sense to be promising, they suggested further improvements and the addressing of its shortcomings before implementation in real life.

**Description**

Sixth Sense Technology, or Sixth Sense, is a concept or an implementation idea introduced by its inventor, Pranav Mistry, in Tedx Talks less than ten years ago, as can be viewed in TED (2009). As Mistry and Maes (2009) mentioned, it is a technology designed to bridge the gap between the physical and digital worlds in a very unique and new way. This bridging is intelligently done, to the point that people are able to live their lives normally and interact with physical objects displaying digital information, as if they are in a digital world. Because of this, the technology was named Sixth Sense due to the extraordinary abilities that a person can perform while wearing the device, as if exhibiting an extra sixth sense in addition to the five human senses of hearing, seeing, touching, smelling, and tasting. The technology was presented in the form of a prototype built by Mistry and his team members at the Massachusetts Institute of Technology (MIT) labs. What is interesting is that new technological ideas usually come at the cost of simplicity. However, the prototype built by Mistry and his team provides a new concept and is simple to set up. It comprises only five modules as depicted in Figure 1, namely a camera, projector, mirror, colored markers, and computing device. The Sixth Sense prototype was built using computer vision and image processing algorithms. All modules are combined to form a wearable device, as shown in Figure 1 (top left image). So how does
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International Journal of Virtual and Augmented Reality (pp. 1-15).
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