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Augmented & Virtual Reality in Iris Recognition A Modern Approach

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***Abstract* – Today, the humanity is living in the domain of technology. This is clearly depicted in this paper. A view to technology is illustrated in this paper. The structure of an eye is also mentioned in this paper. Augmented and Virtual Reality concepts are also mentioned in this paper. All this will certainly contribute in the research sector of biometric dimension. The recognition sector can be of any kind that includes speaker, iris etc. It is expanding at a tremendous rate and also contributing in the dimension of research.**

***Keywords* – Augmented, Virtual, Reality, Technology, Iris Recognition, Pupil.**

I. INTRODUCTION

The mankind is living in a domain of a term called as "Technology" [1]. It is improving day by day at a tremendous pace. It involves multi-functional devices that change the lives of the homo-sapiens every day.

Some people finds it interesting or dramatic and see the positivity in technology, while the others may see it as ridiculous or the extinction of manpower (in terms of employment and some other dimensions but not all). Every citizen is independent and can make use of these things that technology makes or simply leaves that.

Fig.1 View to Technology.

Even the point is that one can capture the world with technology. The term "Virtual Reality" [2] can help in tracking of hand, eye or even face by the year 2022. If talking about any scenario or concept, and its father is not mentioned then it's totally unfair! The patriarch of Virtual Reality is particularly famous as "Morton Heilig" [3].

According to some delineates, if talking about a week, a person or a vive user spends 5 hours on a VR. The matter is that 95% are of masculine gender. One question arises that "Aren't females interested in VR devices", well the matter is not that! Women are equal to men in almost every aspect! If talking about a non-vive user, 87% are male and rest are females.

Talking about the structure of an eye of a person, the iris of each and every individual is distinctive. That means a lot, for a person involved in a biometric business. It means VR can be used as a biometric device. It's really great. But this approach will be possible after few years and not now.

II. RESEARCH BACKGROUND

1. Structure of an Eye

A simple structure of an eye (external) is depicted in Fig.2

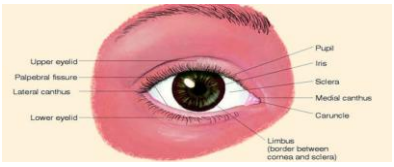

Fig.2 the Structure of an eye (outer).

We are not going into a detail of the structure but will be focusing on the iris section that will contribute in the Biometric division.

The function of the iris [4] in an eye is managing the entire diameter as well as dimension of the pupil, whereas the entrance of light into the eye is to be done by the pupil [5].

Iris is basically thin and round in shape. The color of the eye is depicted by the "iris". A strange fact is that, it can be of any color.

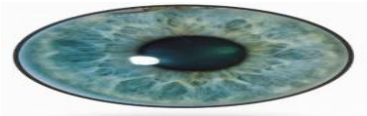

Fig.3 an Iris.

2. Augmented Reality

It can be depicted as an amalgamation of an actual segment watched by a person and a virtual segment depicted by a computer that supplements the sequence with vital processed data [6]. It can be clearly depicted in Fig.4.

Fig.4 Augmented Reality

Layered approach is followed in this scenario. It is used to make something more informative and creative. This approach will come into focus in upcoming future and will drastically bring a variation. To show the Score Overlays [7], this technique is used. To bring out the 3-dimensional variation in emails [8], SMS [9] as well as pictures this scenario is widely used.

The extreme mission of this aspect is that the person should not be able to distinguish between the actual world segment and the virtual enhancement of it. A monitor based augmented reality is shown in the [10] Fig.5.

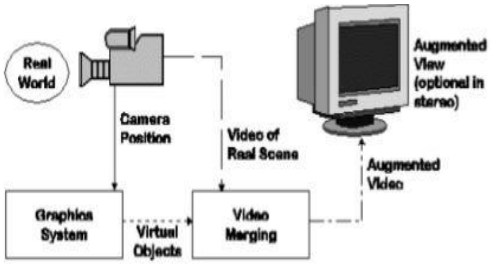

Fig.5 Monitor Based Augmented Reality.

3. Virtual Reality

The re-creation of a real-life domain that is not natural can be depicted as Virtual Reality. It can be depicted from the illustration shown in Fig.6.

Fig.6 Illustration of a VR device.

It basically means feeling the virtual scenario in place of an actual segment. Talking about the history aspect, In 1950s a visionary user console that was used for cinematography purposes was developed by Morton Heilig called as Sensorama [11]. This device permitted a person to watch TV in a 3D scenario. Its illustration can be depicted in Fig.7.

Fig.7 Sensorama.

There are basically three distinctive forms of Virtual Reality that are as follows-

- Immersive.
- Non-Immersive.
- Window on world.

Immersive basically deals with the perception of bodily existence in a non-physical world. Non-Immersive deals the huge and enormous displays but doesn't surround the person. Desktop based virtual scenario is covered in the window on world. Virtual Reality Modeling Language commonly abbreviated as VRML [12] is a language of coding that makes the Virtual Reality exists.

4. Augmented Reality V/S Virtual Reality

Both these terms have an inverse impact with respect to one another. This can be depicted from Fig.8.

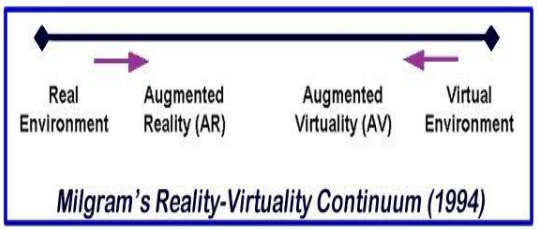

Fig.8 Milgram's Reality-Virtuality Continuum 1994.

In 1994, Milgram developed a Reality-Virtuality Continuum [13] that is illustrated above. It is basically a scale that is continuous in nature. Its extreme end points are completely real and completely virtual.

It has all the possible values that could exist between a completely virtual environment termed as virtuality and completely real environment termed as reality. Virtual reality offers a digital re-creation of a real segment whereas augmented reality offers non-real elements/ informative.

5. Similarities between Augmented Reality and Virtual Reality

In the fields of technology, entertainment and science these concepts have similarities. Remote Surgeries, are compatible with both augmented and virtual reality in the field of medicine. Post-Traumatic Stress Disorder commonly abbreviated as PTSD [14] is a psychological condition that could be healed by both these aspects.

III. AUGMENTED REALITY & VIRTUAL REALITY'S CONTRIBUTION TO IRIS RECOGNITION

In the upcoming five or ten years, when virtual reality will become an everyday part of our lives. People can access their Personal Computers or can make online payments with a blink while wearing their Augmented Reality Glasses or Virtual Reality headsets. It would make their lives really easy. It would be a very secure measure in finance and banking sector that requires authorization [15].

The amalgamated AR and VR trade will be of worth $121 billion by the year 2021. Google and other organizations have leaped into this trade as investors or main players.

Automation that assisted AR/VR [16] to a huge extent is biometrics. Iris recognition seemed to be more comfortable in concern to the AR glasses or VR headsets as it covers the eye section. Many mods can be added in order to make the iris recognition more successful. It can be depicted in Fig.9.

Fig.9 Iris Recognition.

In gaming scenario also, the iris recognition procedure is really helpful as the accounts can be updated and the setting once stored in an account for a player need not to be done again and again.

Slowly and gradually, the iris recognition scenario is confirming its existence in the future trade. This will certainly improve the biometric scenario [17] and will create a large amount of opportunities for the persons to uplift their careers in the domain of biometrics.

IV.CONCLUSION

The domain of iris recognition will become a part of everyone's life in the upcoming future. This is clearly depicted in this paper. The individual aspects of eye structure (outer), a view to technology, augmented reality, virtual reality, Monitor based Augmented Reality Sensorama is mentioned in this paper. The a difference as well as similarities between the augmented reality and virtual reality is clearly illustrated in this paper. The contribution of AR as well as VR in the area of iris recognition is also mentioned in this paper. All these information will certainly contribute to the research and development industry [18].

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REFERENCES

[1]. Roblyer, M. D., & Doering, A. H. (2006). Integrating educational technology into teaching (Vol. 2). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.
[2]. Rheingold, H. (1991). Virtual Reality: Exploring the Brave New Technologies of Artificial Experience and Interactive Worlds-From Cyberspace to Teledildonics. Secker & Warburg.
[3]. Heilig, M. L. (1962). U.S. Patent No. 3,050,870. Washington, DC: U.S. Patent and Trademark Office.
[4]. Reulen, J. P. H., Marcus, J. T., Koops, D., De Vries, F. R., Tiesinga, G., Boshuizen, K., & Bos, J. E. (1988). Precise recording of eye movement: the IRIS technique Part 1. Medical and Biological Engineering and Computing, 26(1), 20-26.
[5]. Stiles, W. S., & Crawford, B. H. (1933). The luminous efficiency of rays entering the eye pupil at different points. Proc. R. Soc. Lond. B, 112(778), 428-450.
[6]. Stallings, W. (2007). Data and computer communications. Pearson Education India.
[7]. Wan, K., & Yan, X. (2007). Advertising insertion in sports webcasts. IEEE MultiMedia, 14(2).
[8]. Edirisingha, P., Nie, M., Pluciennik, M., & Young, R. (2009). Socialisation for learning at a distance in a 3- D multi- user virtual environment. British Journal of Educational Technology, 40(3), 458-479.
[9]. Fjeldsoe, B. S., Marshall, A. L., & Miller, Y. D. (2009). Behavior change interventions delivered by mobile telephone short-message service. American journal of preventive medicine, 36(2), 165-173.
[10]. Tuceryan, M., Greer, D. S., Whitaker, R. T., Breen, D. E., Crampton, C., Rose, E., & Ahlers, K. H. (1995). Calibration requirements and procedures for a monitor-based augmented reality system. IEEE Transactions on Visualization and Computer Graphics, 1(3), 255-273.
[11]. Heilig, M. (1998, January). Beginnings: Sensorama and the telesphere mask. In Digital

illusion (pp. 343-351). ACM Press/Addison-Wesley Publishing Co.
[12]. Whyte, J., Bouchlaghem, N., Thorpe, A., & McCaffer, R. (2000). From CAD to virtual reality: modelling approaches, data exchange and interactive 3D building design tools. Automation in construction, 10(1), 43-55.
[13]. Milgram, P., Takemura, H., Utsumi, A., & Kishino, F. (1995, December). Augmented reality: A class of displays on the reality-virtuality continuum. In Telemanipulator and telepresence technologies (Vol. 2351, pp. 282-293). International Society for Optics and Photonics.
[14]. Yehuda, R. (2002). Post-traumatic stress disorder. New England journal of medicine, 346(2), 108-114.
[15]. Lim, S., Lee, K., Byeon, O., & Kim, T. (2001). Efficient iris recognition through improvement of feature vector and classifier. ETRI journal, 23(2), 61-70.
[16]. Ma, D. (2011). Virtual reality & augmented reality in industry. X. Fan, J. Gausemeier, & M. Grafe (Eds.). Shanghai Jiao Tong University Press, Shanghai and Springer-Verlag Berlin Heidelberg.
[17]. Ma, D. (2011). Virtual reality & augmented reality in industry. X. Fan, J. Gausemeier, & M. Grafe (Eds.). Shanghai Jiao Tong University Press, Shanghai and Springer-Verlag Berlin Heidelberg.
[18]. Wildes, R. P. (1997). Iris recognition: an emerging biometric technology. Proceedings of the IEEE, 85(9), 1348-1363.

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