

A Review on Screen less Display

Sujata Gangwar¹, Ravina Chauhan², Ajay Rastogi³

^{1&2}MCA 4th Sem, CCSIT, TeerthankerMahaveer University, Moradabad, India

³Assistant Professor, CCSIT, TeerthankerMahaveer University, Moradabad, India

¹sujatagangwar27@gmail.com

²ravinachauhan196@gmail.com

³ajayrastogimb@gmail.com

Abstract— Screen less display is an emerging new technology, has become a good prospect in the near future for a wide range of applications. As the name implies it deals with the display of several things without the use of screens and projector. It involves the following three different working principles-The Visual image, Virtual retinal display, Synaptic interface. Screen less display is the present evolving technology in the field of the computer technology. Screen less display technology has the main aim of displaying or transmitting the information without any help of the screen or the projector. This provides the most healthful and visual environment for the user. It are responding to a variety of user commands(using voice hand, foot, or other signal method).it providing blink cues or blinks responses.

Keywords— Foot, Hologram, Hand, LCD, Screen less, voice.

I. INTRODUCTION

Screen less display is nothing but a display that could be shot at anywhere the user wishes to have a screen. Screen less display is the present evolving technology in the field of the computer-enhanced technology. Screen less display technology has the main aim of displaying transmitting the information without any help of the screen or the projector. It can also be said that screen less display is a life-changing concept and also one of the most interesting topic for research. Screen less video describe system for transmitting visual information from a video source without the use of the screen. It is a system of displaying information/data though an electronic video source without using screen at all. It will surely be the one of the greatest technological development in the future years. Several patents are still researching on this new technology which can change the whole view of the displays.

Screen less Display was an excellent thought that came into many experts in order to solve the major problems related to the size of the device. Lower space screen displays have made the need of screen less displays more than ever. Screen less, by the word clearly means ‘no screen’. So, Screen less Displays can be defined as a display which helps to

display and even transmit any information without the aid of screens [2].

There are several types of screen less display that are under development which will describe-

- Visual Image display
- Retinal Direct display
- Synaptic Interface

II. HISTORY BEHIND SCREENLESS DISPLAY

Reto Meier, an “Android Developer Advocate for Google” recently laid out a fairly science-fiction account of where computer (or at least mobile) interfaces are headed [6].

Working on the average laptop is like working on a desk that’s as big as a sheet of paper. That’s why all our “files” are quite inch high. The solution to productivity and immersion is more, bigger screens - hence the proliferation of external monitors, another secondary reading devices and even cellphones with improbably large screens. So-called “Pico” projectors that are named for their tiny size already exist and also the HD version of it exists. And there are lot many mobile phones, which have built-in picoprojectors such as the Samsung Show, - so outside of market demand there’s nothing to stop this prediction from becoming a truth [3].

III. VISUAL IMAGE

Visual image are vise known as hologram, is display an image that is reflected by a substance than proceed by human eye. The display works on the principle that; light gets reflected by the intermediate object before it could reach to the retina [4]. The intermediate object can be holograms, windows, or even LCDs. Some examples of visual image are Holographic display, Virtual reality goggles and Heads up Display.

Holographic Display: Hologram is consisting of two Greek words holos (whole) and gramma (message). Holography technique is used to create and generate hologram. Holograms were mostly used in telecommunication as an alternative to screens. Hologram can be transmitted directly or it could be stored in various storage devices. A hologram is first recorded and then reconstructed whenever it needed. This can be accomplished by capturing the reflected light from the intermediate object. Using this technology 3D image can be constructed or generated. Holographic messages become popular from the Star War movie. Latest fiction movies like “Avengers” and “Iron man” have shown technology in advanced form.

Another example is google glass, which is virtual reality goggles. This technology is type of augmented reality visual image display that displays image right in front of our eye. Beside we have expanded in developing the displays for wearable contact lenses [5].



FIGURE 1. VISUAL IMAGE

A. HOLOGRAM

This form of photography provides a three dimensional image, and some technologies now creates images using lenses, helium neon and holographic film. The word holography comes from the Greek words λογος(hólos; "whole") and γραφή (graph; "writing" or "drawing") [3]. A 3D image will be projected and appears in the air whenever the laser and object beams overlaps with each other.

Hologram provide high quality images and videos and the image can be viewed by human eye that is does not need any special observation device [10].

B. WORKING OF HOLOGRAM

Holographs can work by using a laser beam that can interfere with an object beam. When these two beams get in the way of one another, they can create what looks like a three dimensional image. This image can then be recorded for processing by recording the diffraction of the light and the way in which the beams interfere with one another.

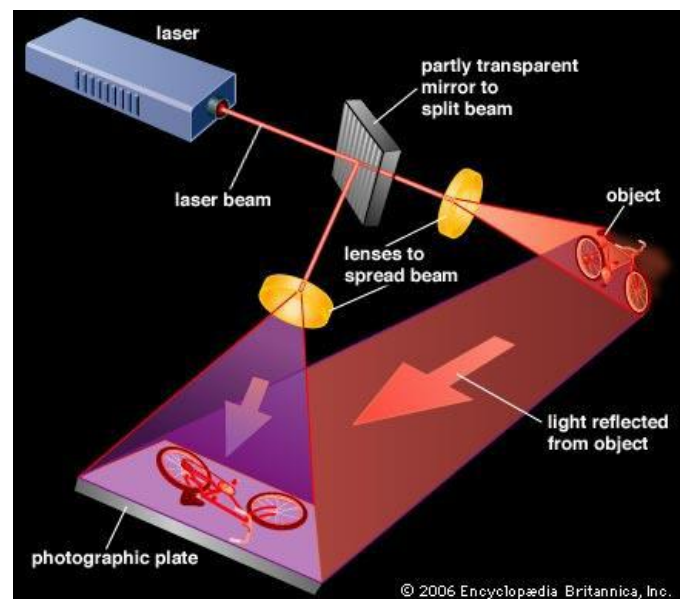


FIGURE 2. WORKING OF HOLOGRAM

IV. RETINAL DISPLAY

In Virtual Retinal Display, the image is directly projected on to the retina of human eye without any intermediate object. Thus this makes retinal display different from visual image. This property of retinal display makes it highly secure, safe and private. This can create an effect of viewing an image from several feet away or a wider and clearer view of any object using special lasers or LEDs to scan light essentially into the optic nerve by mixing primary

colors [7]. The same concept applies to the computer monitor which focus the viewed image onto the retina to be converted into signals for the brain by the optic nerve however VRD is more efficient and effective[9].

Glyph has also developed a Virtual Retinal Display. It also uses a MEMS (microelectromechanical system) type system. As shown in the figure 3.

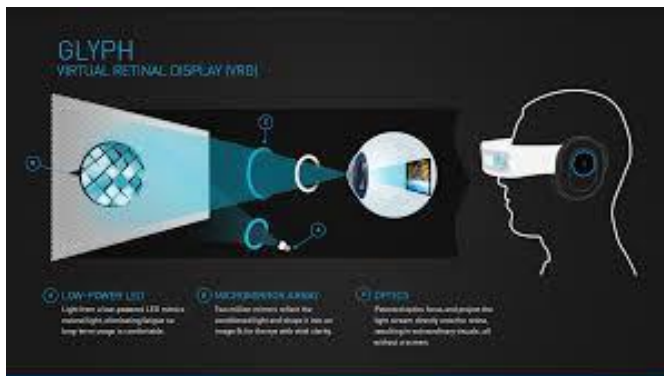


FIGURE 3. GLYPH - VIRTUAL RETINAL DISPLAY

A. APPLICATION

1) Medical field: By allowing the physician to view a virtual X-Ray of infected areas information concerning the patient during surgery. Virtual images produced by VRD could be layed-down with the patient by tracking the view of the physician in relation to the position of the patient.

2) Manufacturing field: The same concept as that is used in medical field can be used in manufacturing environment by viewing virtual blue print that uses C3 images to identify parts placement and operation information.

3) Transportation system: It can be beneficial in any transportation system by proving the display that can project virtual map of the surrounding area therefore in siding vision of providing reference state train characteristics and craft instrumentation

V. SYNAPTIC INTERFACE

Synaptic display is a type of screen less display that does not display an image in free media or onto the retina. It displays by transmitting the signals directly into the brain through the optic nerve. There are no light involved, basically electrical impulses. While these systems have yet to be implemented in humans, success has been achieved on horseshoe crabs by recording nerve images. Sampling usable video signals from the biological eyes of a living horseshoe crab through their optic nerves, and sending video signals from electronic cameras into the creatures' brains by using the same method. Therefore, furthering the neural code transmitted to the brain by the optic nerve. This display offers the possibility of providing sight for the blind by using implanted electronics to bypass non-functional parts of the eye. Imagine a visually impaired person gaining the freedom to drive and self dependent. This will remove occupational limitations of the visually impaired. It can give users the benefit to view images in greater coordination and complexity than the eyes capable of producing. This is useful for security system for effective communication, in education sector, business planning and broadcast. However the method requires more research and development for further production of worldwide application can be implemented.

VI. PROFESSIONAL IMPACT

Screen less display technology offers to enable:

- Corporations
- Businesses
- Health-care systems
- Government institutions
- Non-profit organization

To dynamically share the information as it relates to its specific environment. The edge of virtual information being confine to deice of staginess' single monitor display can be replaced by screen less method. That provides the information that is

- Highly portable

- Versatile
- Interactive

The technology can be applied to any production environment by integrating test specific information that will greatly increase the access security of knowledge thereby, generating an efficient and effective manufacturing process which can also provide faster updates of performance matrix and changes.

Screen less display consumes less power which offers in an economical benefit over standard monitor displays. They use less material to produce and no toxic elements like lead, arsenic, mercury and cadmium. The cost of the environmental impact by disposing displays is significantly less. Also virtualized meeting can be organized that saves time and expenses.

VII. CONCLUSION

These displays are the future that would reach the world of all organizations and institutions by presenting the brighter and efficient and cost effective means of communication, fundamentally revolutionizing the approach to comprehending information. It will going to bring a revolution in the field of displays and will replace the current display technology that is touch-based. And also this screen less display technology promises of cost effective devices which will provide better privacy as compare to the present display devices.

VIII. ACKNOWLEDGEMENT

I feel great pleasure in submitting this Paper on "Screen less display-A New Computing Technology". I wish to express true sense of gratitude towards my H.O.D., Prof. D. D. Patil and my teacher Prof. Y. S. Patil who at very discrete step in preparation of this Paper contributed their valuable guidance and help to solve every problem that arose. Also, most likely I would like to express my sincere gratitude towards my family & friends for always being there when I needed them the most. With all respect and gratitude, I owe my all success to the writers of reference papers that are referred

by me in completion of this paper work activity which will be useful in presenting my survey paper.

REFERENCES

- [1] Screen-less Head Mounted Projector with Retrotransmissive Optics Ryugo KIJIMA, Jyunya WATANABE
- [2] Kiyokawa, K., "A Wide Field-of-view Head Mounted Projective Display using Hyperbolic Half-silvered Mirrors", *Procs of ISMAR*.
- [3] Okano, F., Arai, J., "Resolution characteristics of afocal array optics".
- [4] SPE Annual Technical Conference and Exhibition, 30September-3 October 2001, New Orleans, Louisiana.
- [5] Telecoms.cytalk.com/.../why-the-future-of-mobile-isscreenless-touch.
- [6] US Census Bureau. Statistical abstract of the United States of America. Washington DC: US Census Bureau; 1999. p. 442.
- [7] Beckmann PJ, Legge GE. Psychophysics of reading XIV. The page navigation problem in using magnifiers. *Vision Res* 1996;36(22):3723-33. 3.
- [8] Jaschinski W, Heuer H, Kylian H. A procedure to determine the individually comfortable position of visual displays relative to the eyes. *Ergonomics* 1999;42(4):535-49. 4.
- [9] Webb RH, Hughes GW, Pomerantzeff O. Flying spot ophthalmoscope. *Applied Optics* 1980;19:2991-7
- [10] K. Ranganath, M.Sravanthy, P.Krupali/ International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622, Vol. 1, Issue 3, pp.942- 947