THE FUTURE WITH THE TECHNOLOGY OF SCREENLESS DISPLAY

1.SONAM TIWARI
2.Dr. DEVESH KATIYAR (Asst. Prof.)
3.Mr. GAURAV GOEL
1Student of DSMNRU,
2,3 Assistant Professor DSMNRU
Computer Science Department
DSMNRU, LUCKNOW

Abstract: This report is made in the context of display without screen i.e., Screenless which has became a major chances to occur in the upcoming future for a large range of uses. The main motive behind this technology is to display the image without using any type of physical screens like LCD, projector etc. This report demonstrates about the working of technology of screen less display and its uses in the several areas of science. Using this display technology, we can directly project any image on the human retina, free space and to the brain of human. It requires only light weight device and at that instant the privacy will be at the high state.
Keywords : Screenless, Hologram, LCD, VRD, displays

I. INTRODUCTION

The display without screen or Screenless is just display which can be captured at any place where the person wants a screen. It can be visualized anywhere or any place or direction like on wall or in the open space area. In these days, the technologies are changing very quickly with the help of existing machines and the tools which help us to solve the major issues. This will be not wrong if I say that the technology of display without screen will be a life-converting concept and will also be one of the most exciting topics with the point of view of research. This type of technology also resolves the issue of the area of the display at a particular place. This is a system which displays data/information with the help of an electronic video source without using screen. The technology of display without screen is the one of the evolving computer-enhanced technologies at present. It is sure that in the near future, this will become one of the greatest developments in the technological field. Many researchers are still doing research regarding this new technology which will change the whole view of the display.

The Technology of display without screen was such a brilliant thinking that had came into minds of many experts in order to resolve the main issues which are related to the size of the device. The use of taking less area for display resulted in the need of display without screen. The word "Screen less" clearly states that display without screen. So, Screen less Displays can also be explained as the display which contributes to represent and transmit any type of information or knowledge without the use of screens.

There are present multiple types of display without screen which are under development. These are described below-
- Retinal Direct display
- Synaptic Interface.
- Visual Image display

I. HISTORY

Reto Meier, the "Android Developer Advocate for Google" had recently set out a fairly science or a fiction account of computer where (or a mobile) computer interface is controlled [1]. One thing that will definitely change the use of working on the average laptop, itis like working on a desk that is as big as a sheet of the paper. That is why all our "files" are quite inch high. The result to capacity and captivation is large, so it requires bigger screens – hence requires the procreation of external monitors, other insignificant reading devices and even smart phones with extraordinary large screens [2]. These are also called "Pico" i.e., projectors which are named by their small size which are already existing and its HD version also exist. There number are many no. of smart phones, which are created-in Pico- projectors like as in the Samsung Show, - so for the outside market demand, there is nothing that will stop these type of predictions from becoming true.

A. Visual Image Display

The display of Visual Image without screen includes any type of image which can be viewed from the naked eyes. The hologram is the common example of the display of Visual Image without screen display. Holograms were mostly used in automation to other

screens. They must be conveyed directly, or they can be stored in multiple storage devices (like as in holodiscs) the storage device can be hooked with the holo projector, so that the captured image can be pervade .Virtual retinal display systems is a class of screen less displays in which the images are directly projected onto the human retina. They can be identified from the visual image systems because the light is not reflected from some of the intermediate object onto the retina; so it is instead projected directly onto the human retina.

Figure 1: The Visual Image

a. HOLOGRAM

It is a form of photography which provides image of three dimensions, and some technologies are now creating images with the help of helium, lenses, holographic film and neon. The word holography has came by the Greek words λος (holo; "whole") and γραφή (graph; "writing" / "drawing").A 3D image will be forecasted and will appear in the air whenever the laser beam and object beams will overlap with another. The Hologram provides a great quality images and videos which can be viewed through human eye, and that do not require any type of special observation device.

b. WORKING OF HOLOGRAM

Holographs can work with the help of a laser beam that can obstruct with an object beam. When the two beams cut the way of each other then they creates image which is three dimensional. This image is then recorded for an operation which is done by recording the emission of the light and the manner in which the beams of light interact with each other. The working of hologram is shown by the figure2
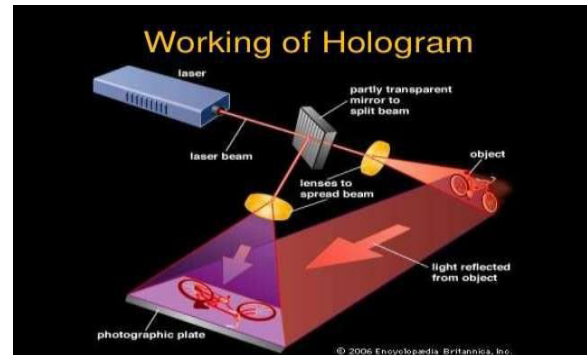

Figure 2: The Working of Hologram

B. Retinal Direct Display

A (VRD) i.e., virtual retinal display, which is also known as a retinal projector (RP) or (RSD) retinal scan display. It is a technology to display without screen which draws a pixel display (as in television) which is directed to directly to our retina of the eye, without the image being reflected in the midst by any of the substances. This creates an effect of viewing image from many feet far or for a wider and a clearer view of any object i.e., by using LEDs or special lasers to examine light basically to our the optic nerve by the mixture of the primary colors .The user sees which looks like an ordinary display which is floating in the space in front of them. The exact concept is applied to the computer monitors, which mainly focuses on the viewed image on our retina which needs to be transformed into the brain signals, but through the optic nerve, nevertheless the VRD is more effective and efficient. Glyph has developed a Virtual Retinal Display which also uses a (MEMS) i.e., micro
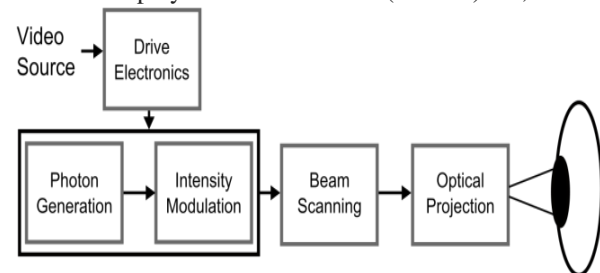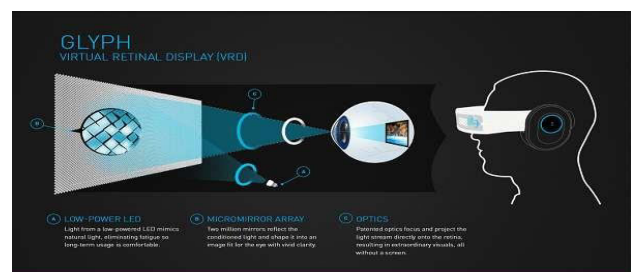

electro mechanical system type of system.

Figure 3: The algorithm of Virtual retinal
Figure 4: The Virtual Retinal Display-The Glyph

C. Synaptic Interface

It is a kind of technology of display without screen which doesn't display the image in the complimentary media or directly to our retina. It is displayed **by transmitting the signals directly to our brain through the optic nerve**.
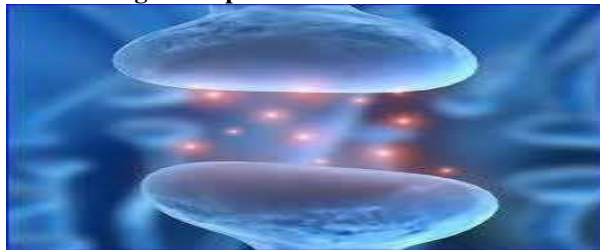

Figure 5: The Synaptic Interface

There is no involvement of light in it, essentially it is an electrical impulses. These methods are **tested on the horseshoe crabs** by doing recording of their nerve images. Moreover the sonic code transmitted by the optic nerve to the brain. This type of display also provides vision to the blind pupils by making use of implanted electronics to the bypass non working part of the eye. It gives the users, the benefits to see images in higher complexity and coordination than what the eyes are capable of producing. Howsoever, these types of methods require higher development and research. Their further production of international applications can be enforced.

II. Applications Of Technology Of Display without Screen

1) **Medical field**: This technique allows the physicians to see a virtual X-Ray image of affected range of information which is concerning about the patient during the surgery. Virtual images which are produced through VRD can be located with the patient by tracking with the view of physician in the relation to the position of the patient.

2) **Manufacturing field**: The exact concept which is used in medical field is used in constructing environment by seeing the virtual blue print which uses C3 images for identifying the parts of placements and the operational information.

3) **Transportation system**: It is beneficial in all types of transportation systems with help of providing a display which is projected in a virtual map of surrounding areas accordingly in cladding vision of providing the reference state of the train properties and crafts instrumentation.

Some other Applications of the Screenless Display technology

Figure 6: The Application applied to mobile technology

Application applied to mobile Technology Screen less displays technology is also implemented for the development of the screen less laptops. A laptop that is without an LCD can be a very helpful, portable solution when connected to fixed LCD monitors or CRT.

The Laptops without screens

Screenless laptops would also be a good resolution, which are giving stable value to CRT monitors which would be landfills heading. Portability gives result as the volunteers, who do not have the daily basis time to travel to people"s houses, that can be more proper way and also can be easily maintain the computer. This technology is also broadly useful in holograms projection.

Figure 7: The Hologram Projection

Hologram projection is the outcome of a innovation of technology which is surely going to helps in holographic interfaces those are touch less. And also it's a fact, a hologram projection is used for projection in 3D image of too high appearance quality that shows, as if we can touch them. The progress of holographic projection acceptance is on going, the conventional holograms offer 3D images.

The special technique of the screen less display by laser technology through the existance of many 3D scope animation or the screen provides the benefit of being combined with the Laser Valve Video Projector(LVV) which is helpful in the projection of video images through laser light instead of Xenon Arc

lamps. The Laser technology has given a peak over the other technologies as LVP gives projector an outstanding depth in focus.

Figure 8: The Virtual screen

It is used in the growth of new screen less TV"s. It is a magical Imagination that while watching the TV picture that will be magically appearing in thin air. The pictures will just floats in the front of viewer; It is going to be a latest emerging technology.

Figure 9: The Magical display in air

III. Advantages & Disadvantages

Advantages:

Low power requirements-Six diodes are required only and a few of a watts to deliver the images to the user"s eyes.

High resolution images- The pixels in the images projected by the diodes can be made smaller than is possible with any CRT or flat panel display, so higher resolution can be achieved. With retinal help of retinal projectors, the only limitation in the resolution of visual images will be the resolving power of the users" eyes.

Larger portability- The combination of the diodes, lenses, and the processing components in a retinal projector system will weigh only a few ounces.

Wider viewing angle –With the help of the Retinal projectors we will alsobe able to provide a wider field of view than is possible with display screens.

More verifiedcolor- By balancingthe light sources to every the intensity of red, green, and blue light, retinal projectors can provide a wider range of colors – and more main is fully saturated colors – than any other display technology.

Greater the brightness and more better contrast- Retinal projectors can be provided by the higher levels of contrast and brightness than any other display system

Ability fordisplay 3D images-According to their capability of presenting high definition image-pairs, retinal projectors canbe deliveredand the most highly realistic stereoscopic movies and it is still pictorial images to their users.

Low costs Disadvantages:

- The principle disadvantage is that Virtual retinal display:
- The (VRD) is not yet present in the significant quantity.
- Prototypes and special experimental models are now created, but their cost per unit is high.
- The VRD technology comesunderthe progress and Development.

IV. Future Enhancements

For the futuristic development of this evolving new technology, several researches are being organized and the several well-known IT sector companies and the other best labs that are present in the world are handling over the project of the Screenless display technology.

- In year 2001 Microsoft hadbegunto work on an idea for an Interactive table that mixes both the physical and the Virtual worlds.
- Multi touch is an interaction technique for human - computer and the hardwired devices thatapply it, which allows users to compute it without any conventional input devices.
- Development & enhancement of the micro vision also gives the revised and the inovative view of screenless displays. This technology of the micro vision is the very well useful in the Artificial Retinal Display properties.
- Japanese scientists have invented the pair of intelligent Glasses that are able torememberlast time where people saw their keys, Hand-bags, iPods, and mobile phones.

V. Conclusion

This paper has been elaborately discussed about the Screenless Display Technology that is the most enhancing computer technology & it is becoming a new exciting thing for the fututure generations as a stage of the inovative technology. As it is having the ability of various benifits those are engaged in

designing, making , coding of system which is Screenless, It requiress the huge amount of knowledge and the development process is still under improvement. In the future the world may be entitled by the display which is screenless technology & this upgrades the world of technological privileged in computer technology field. This technology promises the aspect of cost effectiveness & also computer technology's brighter future.

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