Significance of Holographic Technology in Modern World

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Abstract-- **Holography projection is the new kind of technology that will change the traditional system of communication in near future. With this technology virtual images of real objects can be projected anywhere with accurate details and depth impression. This paper puts focus on holography projection technology. It also focuses on the importance of this technology, the process of construction of holograms and application features that will affect on several areas such as marketing, telecommunication, education and healthcare. It also puts light on future that will help to redesign many fields of life including businesses and technologies.**

Keywords-- **Holography; Holographic Projections; Hologram**

I. INTRODUCTION

Holographic technology is a new technique that will affect the view of things we now observe in the present world. Now it will give a tremendous effect on every field of human life in their business, education and health. Actually, it was invented by physician Dennis Gabor in 1947 [1]. In this method pattern of light is recorded and later that pattern can be rebuild as a three-dimensional image, called hologram. It creates a hallucination of three-dimensional imagery. The recorded image called hologram appears as a design of strips and helix since the laser beam constructs the light into the three-dimensional appearance of the actual object or entity.
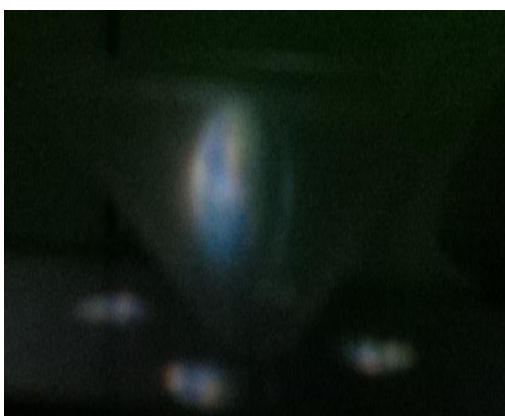

Fig.1. Holographic image

A hologram reproduces an image that appears in space as a floating object giving depth and perspective. Actually, it was found in a technique named pepper's ghost used in London in 1860.In pepper's ghost technique a figure look like ghost is created on a stage. A person who was hidden from viewer with ghostly costume would stand facing an angled plate of glass [2].The viewer cannot see that person directly.

Holographic technology performs a tremendous job for the purpose in advertising and promotion of products.

II. IMPORTANCE OF HOLOGRAPHIC PROJECTION

In past, to view the hologram, stereoscopic approaches like polarized eyewear or a headgear had to be implemented successfully, but now people want to enjoy the hologram view without wearing any equipment like glasses on eye or a headphone on their ear [2]. Here need not require any obtrusive equipment to view a holographic image. This can also solve the problem of simultaneous viewing. Using this technology virtual world would be more realistic and interactive.

Holography also takes an important role in the storage of data. At present capacity of storage data is dominated by optical and magnetic data storage. Holography data storage has advantages over other available technologies where information is piled up in a medium by utilizing different angles of light. Data are recorded in optical and magnetic storage device in the linear fashion, whereas holographic technology stores the information in parallel way. The speed of data transfer with this type of holographic storage is higher than any other traditional methods.

III. HOW IT WORKS

In 3D projection technology, an object has been captured by a special built camera and projected at various distant places simultaneously. The viewers can feel the presence of that object in front of their eyes as a real object although it is actually a hallucination of three-dimensional imagery of real object.

In this technique, light disperse from an entity to be recorded in a medium and later it will be reconstructed as the absence of actual entity. A hologram actually works in the following

manner- light which comes out from a laser is divided into two independent beams – the object beam and the reference beam. In object beam, object is reproduced directly onto a photographic medium without any reflection. However, the reference beam is reflected into the photographic medium that makes an interference pattern between both beams. This pattern captures all the phase property of light. After this procedure, the hologram is not perceived by the naked eye. For allowing reversal of this entire process, the original laser light must be captured into the plate. Recreation of light which originally bounced by the object creates a realistic virtual object. The procedure of record an image of an entity has been described in Figure 2.
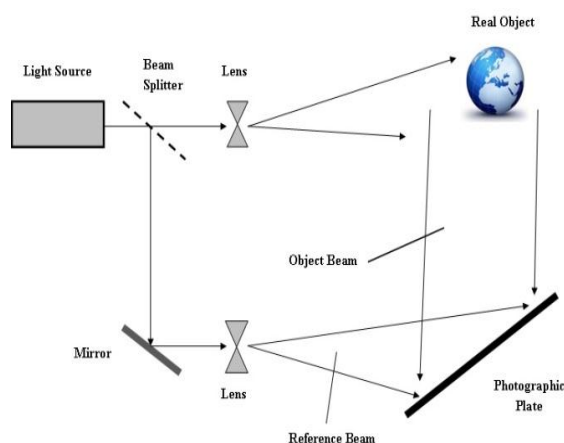

Fig.2. Holographic recording

To view a realistic virtual object, a source of light is directly scattered on photographic plate and follow the same direction as was the reference beam. As a result, a 3D image of object look like actual object or entity appears in the space.
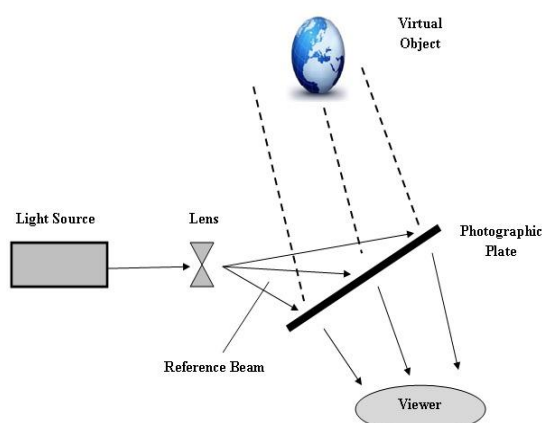

Fig.3. Appearance of virtual image

IV.   APPLICATIONS

Hologram can be used in areas such as marketing, advertising, education, CGI animation and many other fields. Today, video and animation are directly shown through high quality HD projector instead of actual object's reflection on a glass. Now this technology also used on debit card, credit card and also on a membership card [3]. This technology has a promising future. Many big organizations are advertising their products and marketing their business through this holographic technology as audiovisual display provides a high value of trustworthiness [4]. A computerized hologram like virtual assistant can stand in front us and help in the conversation on several topics that can be more interesting for kids. With the help of hologram those kids live far away from home can interact with their parents as feels they are close to their family [4]. It also performs a crucial role in education system. In higher education, a virtual teacher can teach students from many kilometers away. Student can directly communicate with the teacher as all of them were in same room.

V.   FUTURE SCOPE

Holography projection has a big future ahead. Today holography projector has become smaller that makes a possibility in near future it will incorporate into phones. Holography data storage can also maximize the memory capacity of phones. It now helps on displaying molecules of biological structures, models of buildings, construction and wardrobe industry. This technology can greatly help in traffic system where virtual traffic policemen will be monitoring the traffic signs. Now holography incorporated in camera, iPod, laptop, computer etc and can provide memorable photographs on the home's wall. In near future, this technology combined with artificial intelligence will make more realistic virtual assistants and also in medical science where a doctor can view artificially constructed 3D pictures of human internal body where surgeons can plan their action through manipulation of 3D images before performing actual operation, thus maximizing the chances of successful operation.

VI.   CONCLUSION

Holography projection has endless features as a human can imagine. Now holographic images have significantly improved over better quality of source light, photographic plates and other recording medium. It will serve to produce high-resolution 3D audiovisual images without using any equipment like headgear or eyewear. Nowadays, holographic 3D movies and pictures are being produced in a fashion that surprises the viewer to some extent point. It brings live holograms from one location and beams them into another location. This technology will be improved to an extent where it will be impossible to make a difference between holographic images and the real objects by the accuracy of holograms, high-resolution images, interactive display and an accommodating feedback mechanism. Holography projection provides a realistic virtual environment where people can

communicate with one another without their actual presence. In near future, it will perform a crucial job in our daily life.

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