

A review on recent development in Holography

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Abstract - Now a days, technology is going through beyond our expectation and always discover new gadgets every time and every second. In this paper, we are saying about Dennis Gabor who is the inventor of this unremarkable thing and overviewing those papers which is basically made by Hologram through Holography. We are following and recognize some articles where all the Hologram or Holography papers are long lasted. And know about briefly that the meaning of the Hologram and Holography in our modern future where every people can include themselves through some new inventions and projects where something is floating in the air or something is moving or running through the projector and also so many thing. We are describing that as a review paper about hologram through Holography. That's all we may have concern.

Key Words: Holography, Hologram, interference pattern ; wavefront; bandwagon; Ambisonic sound; "rain rig"; IOP Publishing Ltd; Electron Microscopy; exploitation of interferometry; Gatorade Water.

1. INTRODUCTION

Between all the technologies and achievements, there is one thing which will be discovered through an image which we can touch and feel in a 3D display around the world. That's called holographic image. This image made by Hologram. And when all the contrast themselves together, they are called Holography.

Holography is a unique technique that enables to record a wavefront and re-constructed it. Holography is also known as generating three-dimensional images method, and it also has a range of applications which spread widely. Now a days, a hologram can make for any type of wave. superimposing made hologram a second wavefront (reference beam) on the interest, thereby it generates an interference pattern where a physical medium is recorded.

The Hungarian '**Dennis Gabor**' who is the father of **Holography**, who invented the hologram and explained his discovery when he published an article since the year of 1948: "The purpose of this work is a new method to form the stages of an optical images is being purposed.

Importance of Holography through Hologram

Hologram technology is getting a start slowly and give a good result in our daily lives. Students who are in medical line are now being learnt to use something new that educates them learning from holograms.

On the hologram bandwagon the industry for entertaining jumped and beamed around by the mobile game.

In the hologram technology the developments have been leading so many industries which takes advantage of their facilities.

In simple terms, a three-dimensional projection which is made by Hologram technology can be notice without taking special things such as cameras or glasses. any angle can view from the image, so the user walks around through the display and the move and shift the image professionally. a product picture stays as a static Holographic Image, or graphical sequences watched by multiple people from any point of view.

Working Principle of Holography

Holography is a conceptual technique that enables a field of light which is to be recorded and rearranged when the light field is real, is no longer stay, the original objects is due to be absent.

Holography can think of as somewhere as sound recording, whereby vibrating matter created sound fields like musical instruments or vocal cords, that it can be reproduced in such a way is encoded later, without the real vibrating matter. However, like Ambisonic sound recording in which a sound field can rearrange from any side of the reproduction. **Main Types of Holograms**

In the Holographic Projection, there are so many types of holograms are used for 3D Projection. That is-

- **Transmission Holograms:** Using the light source and the lasers is situated through the hologram to observe the transmission.

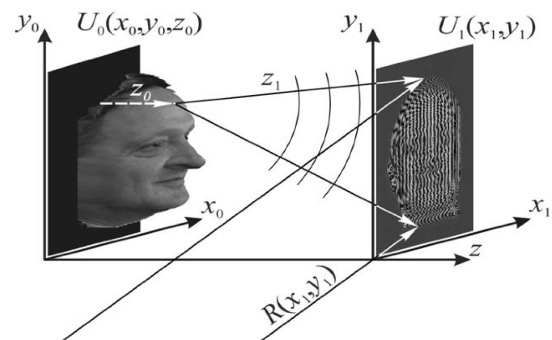


Fig:1

• **Reflection Holograms:** A light source is used to view the same side of the hologram.

• **Embossed Holograms:** On the credit cards, we typically saw that there are the only one type of hologram we used. The pattern of these interference is recorded through a stamp of metal and then the cheap foil is to be imprinted.

• **Computer Holograms:** In the models of mathematics, the pattern of the interference through the hologram to calculate by a computer.

• **Rainbow Holograms:** When the same image appears through the various types of colours then it will be viewed from the different side of angles.

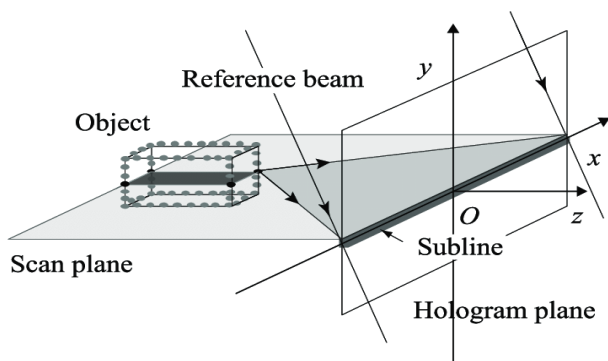


Fig:2

5 Most Advanced Holograms through Holography Projection

Laser Plasma Hologram: A display which is made by hologram that utilizes the light alteration to invent a three-dimensional image virtually. Other forms of three-dimensional display distinguish Holographic Display, which is not to require any special glasses, but a viewer can see the images by using external equipment.

The display which is made by Laser Plasma which is discovered and developed in 2005 by the Texas University that can utilizes a powerful series laser which focused desired positions of light.

If we want to create excitations of Plasma in the air molecules of Nitrogen and oxygen, then image of thin air can be produced these types of Holographic Display without any screen sort or external media of refraction.

The display with Laser Plasma is ready to construct very bright and seem able objects but here always resolution terms and the quality of the picture is licking.

Fan Type Hologram: There are some types of displays which produced by Holographic fans. In this fan, there are a floating image in the air and RGB LED is attached in the blade

of the fan and when it's turned around and produce full picture the pixels are being lighted up by a control unit.

When the display is spinning fast it will give a moment of trick in the observer's mind and when the observers can see the whole object will be floated in the air, they think that a image is floating at that time.

Gatorade Water Hologram: When a custom made "rain rig" dripped in the water then the figure which is made by water is looking like an athlete is running by the liquid animation.

For making this water hologram, we must contain 64 liters of water and every one time there are always 8 units running. That's why for making these holograms, we are using a half tone water for running it.

For making the character of the water, we must be captured the motion of a human being when he or she was running, kickboxing or jumping. When the nozzles are on and off, then the water rig was given the data by capturing the motion.

When the water droplets are turned on and off, it will be used by a series of 2048 switches. If they want to stick the water droplets in the mid air, then the team used the flash-lighting to capture the motion in every millimeter and in every microsecond accuracy. For that thing, an entire layer is transmitted through the entire system within a microsecond.

HoloLamp: 3D objects is put through the Microsoft's HoloLens in front of our face.

HoloLamp is a projector on the tabletop that projects three dimensional images right in our environment.

In other hands, its kept promise that the augmented reality can be possible from here, without making us wear something. HoloLens can make an architect looking like a Blueprints which we need to take 1.2-pound headset to do it and charging it first. Now, their drafting desk would only look at an architect with the HoloLamp in blueprints.

Portable Holographic Device: Images which is made by Hologram, are NOT holograms but in the modified air, vector images are protected through the Volumetric vector images. A hologram is a recording of patterns of the interference on glass or film. When the plates want to plate that contains three-dimensional information about an object. Also, Hologram images have free- floating things in the air and also contain three dimensional images Most certainly Holographic images are real three-dimensional projection.

2. Literature Survey

In the paper 1: Optical components designed by Holographic Display for high brightness in single LED Projector which is held in "ELECTRONIC IMAGING on 8th May,1997" from San Lose at CA in United States, 'Cecile Joubert' who is the author of this article said that a single-

LCD projector with the optical efficiency can be improved by 'spatio-chromatic illumination', method. If we want to perform in this method, he has to present two systems which is based on volume holographic components. The components dispersion property of the primary colors, being performed either by classical or holographic micro lens. He also said the spatio-chromatic illumination method with volume holographic elements is executed by a complete luminous efficiency which take into limitation considerations.

In the paper 2: Digital holography which acts as a metrology tool at micro-nanoscale for soft matter which is held on February 18th, 2022 this article will publish by the author whose name is 'Pietro Ferraro' said that in the field of optical metrology the exploitation of interferometry enabled on the non-mirror surfaces and full-scale objects. This has been implemented to several industrial systems. They also said that Holography considered an important measurement tool for NDI. There is also strain-stress measurement and vibration analysis at various engineering sites.

In the paper 3: Electron holography is a holography technique which is held in the "IOP Publishing Ltd on 17th December, 2007", Hannes Lichte who is the author of this paper explained that Transmission Electron Microscopy which suffers from a severe drawback. So, to achieve a poor phase contrast the phase structure are virtually invisible. Here, the conventional TEM is blind for electric and magnetic fields. In a pure phase objects the atomic structure is provoked by such fields. TEM offers Electron holography in the solution of a coherent reference wave which is recorded by a Hologram.

In the paper 4: 6G wireless networks giving opportunities, challenges and trends by using the wireless environment. And there are HMIMOS which refers wireless planer structure in a low cost transformative.

Holographic MIMO surfaces. At the year of 2020, IEEE published this paper in the book of Wireless Communication and the author of this paper is Chongwen Huang. In this paper they thought about the future of our wireless networks where intelligent, and software ubiquitous communication is expected to evolve between humans and mobile devices. To fulfil low power, high through-put, massively connected and low latency communications humans and mobile devices will also be capable for sensing, controlling and optimizing.

3. CONCLUSION

By the review paper of the Holography, we can justify that Holography which is firstly made by DENNIS GABOR can be always acceptable for our modern days and our future generations. Holography gives an overview about all the articles and all the inventions are going to be next step like electron holography extends in various types of inventions where TEM gives various types of references through the

atomic structure which is provoked by such fields. And there are 6G wireless technology which is widely using for the Holographic MIMO surfaces. LED projector now gives use multiple types of option to invent the best work by using Holographic Display. Digital Holography is important for NDI and it is need able for all of us. That's all the points about which we can think something different about holography gives us a new eye side to know precisely the Holography.

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