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The Effectiveness of Hologram Technique's Employment in TV Programs from Expert's Perspective: A Qualitative Study

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Abstract

Advancements in technology continue to shape and re-create the way content is produced. One such innovation that has captured the attention of both TV producers and broadcast designers is the use of hologram technique in broadcast programming. This study aims to examine how the hologram technique can be used in TV programs considering TV experts' opinions through the advantages and disadvantages of this technique based on in-depth interviews with a sample of holographic experts conducted in light of the technology acceptance model. According to the study's findings, the visual application of hologram technique has allowed for the embodiment and merging of virtual and real individuals in TV program environments, it contributes to the development of the appearance of TV programs, which appear in a new way using the latest technology. Hologram technique adds a visual dazzle to the programs and an attractive new design to the viewer, who will follow the program in its unconventional form.

Key Words: Hologram Technique, TV Programs, Media Industry, TV Experts, Technology Acceptance Model.

Introduction

Recently, the advancements in technology are reshaping the landscape of TV programs On-air graphics have become essential in enhancing the visual appeal and informational content of TV programs. With advancements in graphic design software and hardware, TV producers are now able to create stunning and dynamic graphics that engage viewers and enhance the overall viewing experience. These on-air graphics not only add visual interest but also provide valuable information. In the environment of TV program production, hologram techniques are pushing the boundaries of creativity and innovation. The use of hologram allows TV producers to create a realistic three-dimensional image that can interact with presenters and enhance storytelling in a whole new dimension.

As, hologram has a special ability that allows it to closely resemble the image of the original objects in all three dimensions. The phrase is derived from the Greek words "holos" (whole) and "graphe" (writing). Hologram technology is one of the three-dimensional imaging methods that employs light reflection to produce a three-dimensional picture. This approach offers us a more complete and realistic image, as well as more details about the body that it displays in a three-dimensional model that can be viewed with the naked eye. Individuals get a sense of emotion from this. Holography is a photography technique that generates a three-dimensional image by capturing the light separated from an object. Holography is the science and technology that can completely reconstruct a picture. Holograms are a real three-dimensional projection technology that can be seen with the human eye since they are physical things created using laser beams or light reflection. (Abawajy, et.al, 2019).

However, the history of holograms dates back to 1947, when Dennis Gabor developed the holography theory to improve the resolution of an electron microscope, but the lack of coherent light sources prevented further development. While Emmett Leith and Juris Upatnieks of the University of Michigan discovered holography could be employed as a 3-D visual medium in 1962. They used a laser and a "off-axis" methodology to reproduce Gabor's method, resulting in the first 3-D laser transmission hologram. As a result of their work, the equipment used to manufacture holograms was described. In the early 1980s, scientists and academics have been creating a holographic television and movies (Capucci, 2012). By incorporating hologram techniques, TV programs can captivate audiences with cutting-edge visual effects that were previously unimaginable.

Literature Review

The researcher discovered a gap in previous research on the usage of holographic techniques in the media industry. Most of the research on hologram techniques was conducted in different fields. To focus on the research problem, only relevant studies were used, as shown below:

Previous studies concentrated on discussing the use of hologram technique in the media industry. As, how can hologram be applied in broadcasting according to (Shoidin & Pazoev, 2021) Remote Formation of Holographic Record. This paper gave examples of how the hologram technique can be used to produce holographic images of a real 3D picture of a person and send them

over a Wi-Fi channel. The images displayed are 3D infrared pictures. The findings showed that 2D holographic signals are converted into 3D holographic images by removing the signal carrier frequency, which compresses the holographic data for speedy transmission. Furthermore, this method seemed to be more promising for developing the use of hologram in TV broadcasts than currently.

Also (Shoydin, et.al, 2021) Recording a Hologram Transmitted over a Communication Channel on One Sideband. In this study, holographic data of a three-dimensional portrait of a person was transmitted and received over a Wi-Fi communication channel added by a computer with the location frequency of the transmission medium. Following that, the holographic data was produced on a material called photoresist. The results showed that the processing and recording of 3D holographic frames can be broadcast at the frame rate required for TV visuals and at resolutions up to Full HD. This technique was also developed to offer immersive experiences between the hologram and the viewer.

So (Kim, et.al, 2023) Central Angle Optimization for 360-degree Holographic 3D Content. The purpose of this research was to develop a technique for determining the perfect central angle for creating realistic holographic content. Researchers designed a method to evaluate different values of central angles among surrounding camera perspectives from the origin of an object-centered atmosphere. The researchers applied an experimental approach. Following that, the results showed that the perfect center angle could produce excellent image quality for employing realistic holographic content. Consequently, this will develop methods for producing 360-degree holographic material that is immersive and incredibly realistic.

Although (Qian, et.al, 2022) Remote Production for Live Holographic Teleportation Applications in 5G Networks. This study presented an innovative media application called holographic teleportation, which enables individuals to be teleported in realistic, real-time holographic transmission through the 5G advanced computing system for distant broadcast production. Supporting these kinds of software would require more networks than traditional content. The results showed the effectiveness of 5G-based remote production operations in four areas: object-capturing scenarios, transport-layer processes, indoor and outdoor locations with incorrect connections, and data requirements. Including the quantity of transported objects and the necessary number of sensor cameras. These assessments provide the basis for the development of holographic transmission through 5G systems for enhanced interactive content and faraway production broadcasts.

Even Though hologram used in tv concerts by (Chang & Shin, 2019) Virtual Experience in The Performing Arts: K-Live Hologram Music Concerts. This article examined the case of K-Live, an arts center in Korea that hosts holographic concerts. The purpose of this explanation was to clarify how K-Live uses hologram technology to control and direct the audience's virtual experiences, keep them interested and enjoying the performance, and create new kinds of content. As part of the detailed research to better understand this novel phenomenon, the researchers conducted interviews with stakeholders, members of the audience, and members of the production team. The main source of data for this study was qualitative, and the researchers were particularly

interested in how audiences engaged with and reacted to virtual representations of their lives. According to the study's findings, a large number of participants and audiences are eager to embrace and completely engage in the grabbing virtual atmosphere of the holographic concert.

Therefore (Stojnić, 2016) Live Or Living Dead: (Un)Setting The Stage For The Hologram Performer. Through looking into the growing phenomenon of hologram performing at concerts, this paper redefined what it means for a performer to have "life" in a live performance at a concert. The media paid close attention to Michael Jackson's enrollment at the 2014 Billboard Music Awards because of the hologram's convincing spectral "presence." Viewers may recall Céline Dion and Elvis Presley's holographic 2009 duet or Tupac Shakur's hologram Coachella 2012 'live' concert. Although "stage resurrections" of deceased celebrities may produce the most stunning results, so do the Black Eyed Peas band members who couldn't make it to the NRJ Awards concert in France. The idea was to make them look like holograms due to the prior obligations for a performance in the US. So, both concerts would feature "live" performances from the entire band. Therefore, the findings indicated that using holograms to increase the quantity of live performances by current performers is an additional approach.

Additionally, there are also other uses of hologram techniques in the media industry, like TV conferences by (Karim, et.al, 2023) Life-size telepresence using holographic display. The purpose of this study was to suggest broadcasting teleconferencing. holographic projector-based telepresence at life-size. Three steps had been identified in this research to achieve the goal. The tracking method using the Kinect sensor must first be made available. Agora.io networking is made possible in the second phase. The final step was to use a projector to build up the holographic display. According to the findings, the life-size telepresence employing a holographic display application had succeeded in meeting the project's goal and showed that the life-size display improved the holographic presence experience of the users and increases effective communication between individuals.

While (Fadzli, et.al, 2022) Real-Time 3D Reconstruction Method for Holographic Telepresence. In this study, a live 3D reconstruction of a captured human was presented and integrated with an application for holographic teleconferencing. Hologram projection was widely recognized as one of the most promising 3D display techniques. The procedure for preparing the experiment Methods included data collection, background removal, and capturing. Texture mapping was also used to create high-quality textures on the 3D mesh using RGB-D cameras for holographic teleconferencing, including the positioning of devices like computers. The experiment demonstrated that live 3D reconstruction has been effectively integrated with the teleconferencing system and display at the remote location.

Moving to another kind of using hologram in advertising by (Chin & Kim, 2017) Converged Study of Influencing Consumer Factors on Hologram Media Experience. The goal of this study was to look into the potential use of hologram media for consumer communication in advertising. Factors that influenced consumer's media experiences, such as motivation and personality types, were established. The structural effects of electronic word-of-mouth and purchase intention were

investigated as well. It was found as a result that customers' natural and social motivations had a positive impact on the interaction with the media and electronic word of mouth. This outcome might be viewed as evidence of the necessity for an integrated marketing communications strategy, or media mix strategy.

Furthermore (Baltezarevic & Baltezarevic, 2023) Benefits of using holograms in marketing communication. This study explored how 3D holograms are being used increasingly in marketing communications. The use of holographic technology in marketing can help the company define the brand as unique and growing, whether hologram images are projected on billboards, virtual catalogs, or used during promotional events. In the following five years, the holographic market is anticipated to expand by 30%. Holographic representations of products that enable buyers to touch them and even feel their textures are currently possible. Customers who engage with holographic projections may find it easier to imagine themselves using the products in the future, which ultimately influences their decision to buy. The findings showed that a holographic presentation enhanced with powerful visual components and quick movements; is impressive to the consumer, pleasing to the eye, and creates a positive connection with the product presented using this technology.

Benefits of Literature Reviews

By reviewing previous studies, it becomes clear to us some aspects of benefits, which are:

Practically:

· Hologram technique has played a role in fostering the growth of creators with experience in modern technology as they use equipment and software to realise creative visions in TV programs.

· Studies have demonstrated the potential for applying hologram technique in TV programs, which helped in the creation of high-quality TV programs.

· According to some studies, it possible to combine visuals with the live image and have them adjust in real-time to the display.

· According to studies, holographic technique has the potential to bring public figures who have lived away and make interviews with actual people.

· Additionally, few studies focused on the use of the hologram technique in broadcasting, instead, most studies concentrate more on the use of this technique in the media industry.

Theoretically:

· Previous research helped determine the best method for the study, which is the In-depth interviews as a tool with Experts.

· A recent study seeks to investigate the use of hologram technique in TV programs according to Technology Acceptance model.

Research Problem

The current study's problem is to investigate the TV expert's opinions toward the effectiveness of using hologram technique in TV programs and how it used to develop the shape of broadcast content through in-depth interviews with a sample of holographic experts.

Research Objectives

1 - Investigate the ability of holographic techniques to be employed in TV programs.

2 - Monitor the advantages of creating display strategies for TV programs utilizing holographic techniques.

3 - Examine the TV expert's opinion on the benefits and drawbacks of holographic television.

Research Questions

1- How is the holographic technique used in TV programs to create a new visual language?

2- What are the various benefits of adopting holographic techniques for TV programs?

3- What challenges must be overcome for the holographic technique to be employed in TV programs?

Theoretical framework

This Research applied **Technology Acceptance Model.**

While (Sagnier, et.al, 2020) consider the technology acceptance model one of the most widely used models of technology acceptance, the technology acceptance model, is information systems theory that models how users come to accept and use technology. The model suggests that when users are presented with a new technology, several factors influence their decision about how and when they will use it. As hologram usage in TV programs is considered a new form of TV programming, it creates something vague that needs to be clarified to the audiences. Perceived ease of use and perceived usefulness are the two main elements influencing an individual's desire to adopt new technology.

This is achieved by examining the attitudes of broadcast designers regarding the advantages and disadvantages of utilizing hologram techniques in broadcasting, as well as the factors that impact their acceptance and utilization of the technique. This can be carried about through figuring out the perceived value, the anticipated work, and the tools that are available, leading to the broadcast designers' opinions about the use of hologram techniques in TV programs in the future. So using hologram will be a part of TV programs; owing to the fact that it will create a unique harmony between the content and the audience's perception, which achieves the aims of the theory.

Methodology

This research was applied the qualitative method using in-depth interviews as a tool with TV experts to investigate the employing of hologram technique in TV programs and give information about the benefits of using this technique in develops content broadcast.

TV Experts' Sample for In-depth-Interviews

The selection of holographic experts were based on:

1- They currently or formerly worked in the TV broadcasting industry.

2- Knowledge of graphic design was required.

3- They must have at least three years of experience with holographic techniques.

Table (1): Interviewee's characteristics

Num-bers	Names	Job Description	Experience
1	Abdullah Gamal	Senior Graphic Designer VR / AR Artist at MBC MASR.	16 years of experience in the broadcast media industry. 7 years at Al-Hayah TV. 9 years at MBC MASR.
2	Asad Zidan	Graphic Design Manager at Middle East Broadcasting Center (MBC).	11 years of experience as a viz artist at the Middle East Broadcasting Center.
3	Issam Al-Deek	Founder Voxel Animation & Visual Effects Company.	16 years of experience as a VFX artist. 2D-3D generalist. Animation art. Director/Compositor. Painter/Sculptor. Figurine maker
4	Hasan Hina	Founder NDP-New Dimension Production Company.	+15 years of experience as an executive producer. Director of hologram shows produced more than 30 hologram live concerts around the world.
5	Ahmed Sherif	Post Production TV Technical Director at Mercury Visual Solutions.	10 years of experience in the media industry. 2 years at CBC 8 Years at Mercury.
6	Ismael Nour El-Din	Head Of Motion Graphics at Aroma Designs & Solutions.	+10 Years of experience as a motion graphics artist.
7	Mahmoud Sabry	Assistant Professor at Academy Of Arts. Art Director.	+10 years of experience in Theatrical performances using hologram technique. won the artistic creativity award in Rome for the manufacturing of a hologram device.
8	Osama AlObaidy	Graphics Manager at Asharq News.	16 years of experience as a broadcast graphics designer. 10 years at El baghdadia TV channel. 3 years at CBC. 3 years at Asharq News.
9	Mina Amin	Team Leader 2D / 3D / Unreal Engine at Sky News Arabia.	+10 years of experience as a motion graphic artist and 3D specialist.
10	Ahmad Abu-Hazeem	Hologram Technology Devices Expert.	10 years of experience in the field of making holography devices across a range of marketing and product visualization applications.

To gain a deeper understanding of holographic techniques and evaluate their importance in developing TV program, the researcher prepared a series of questions:

First dimension: Employing hologram techniques in TV programs

1. How is the hologram technique applied in TV programs?

2. What kinds of TV programs should use the hologram technique?

3. Is the hologram technique applied in TV programs in a way that fits with their nature and purpose? and why?

4. What are the positives and negatives of applying hologram technique?

5. What does using hologram technique in TV Programs look like in the future?

Second dimension: The impact of using hologram technique on TV programs

1. How can the hologram technique play an effective role in presenting the content of TV programs?

2. How does hologram technique help in the development of TV programming formats?

3. To what extent does the TV studio's decor match with the hologram technique design?

Third dimension: The impact of using hologram technique in the TV industry from a production perspective

1. To what extent does the employing of hologram technique in TV programs depend on the cost available?

2. What is the difference between a studio that is designed to use the hologram technique and a traditional studio, according to the cost perspective?

3. Does the use of the hologram technique have any special requirements in the TV studio area? and why?

Fourth dimension: The hologram technique's technical issues

1- What are the technical problems that may occur while using hologram in TV programs?

2- To what extent can technological errors be avoided?

3- What would happen if the hologram's character and the movement of the presenter weren't synced up?

Fifth dimension: Factors that impact hologram technique design in TV programs

1. What obstacles have kept hologram techniques from being widely used in TV programs?

2. What do you think about the lack of understanding about the necessity of employing and benefiting from hologram techniques among TV producers?

3. Is there a shortage of hologram designers available to seek help with TV programs? and What is the cause of that?

The following aspects were used to present the findings of the in-depth interviews

1. **Employing hologram techniques in TV programs:**

Regarding the utilization of hologram techniques in television programs, **all experts agreed that** there are two approaches to using them:

·   In front of a green screen is a person. The person is using earbuds to hear the presenter talking to him. In addition, a camera contains tracking data that records the human image from a specific angle and transmits a feed that includes the data to the other studio. That other studio then receives input as a signal, and it transfers the same information to the camera. So, the human

appears to the camera in the other studio from the same perspective as he is there.

· Then the data goes through the on-air graphics software, such as VizrT or zero density, and receives the human image. Through this software, the image is keyed with a chroma key. An aside tweeting code is then used to give the image a specific plending that shows it is a 3D hologram. Following that, to allow for this person to appear inside the studio, a specific position is masked in the TV studio that the designer marks.

· Nonetheless, before setting up the individual, it is important to understand the fundamentals of the TV studio. One of the essentials of understanding your 3D system well is (0.). The center of the TV studio is (0.). You begin to compute how far you are from the objects' dimensions and your center point. For example, if the announcer is standing at 10 m, after 10 m, put the hologram there. and all of these measurements are determined according to your design.

· So, an off-camera monitor that was only visible to the presenters was positioned in the studio at a precise angle to interact with the live feed.

· The second technique uses a lighting system in which a person is placed in front of a green screen with a camera that records their physical form, converts that video into LED lighting, transfers it to the other studio, and is projected into the studio using a projection lighting system to give the impression of a hologram.

· But **Asad Zidan and Osama al-Obiedy mentioned that** there are specific cameras that are used, such as broadcast or professional cameras, with specific qualities that include specific sensors. For example, when an individual moves or turns his face, the camera takes a motion capture of individual geometry and sends the stereo signal to the other studio. Additionally, to obtain the most effective signal quality, this technique will go via the Internet, as this is a way to stream content over the Internet, such as using PTZ cameras. It transmits a video signal via the cable Internet.

Moreover, **some experts have determined that** certain TV programs, like talk shows, news, and sports programs, need to employ the hologram technique. For example, in sports programs, we can talk to a live reporter from another place in a different country; he will tell us the news, and we will be able to hear the live studio presenter talking to him. We can also host analysts or football players after matches. In talk shows, a broadcaster may use this technique to have a conversation with a guest rather than being present in the studio. **Hasan Hina further stated that** this technique should be used in competition programs where the competitor is captured on camera from his own country without having to travel to the jury's location. **Mahmoud Sabry mentions that** when using hologram in entertainment shows, it will be very important that we bring up a singer who has passed away, and he continues to sing in front of the audience, and the audience begins to interact with him and his old songs. **Asad Zidan** also added that this technique can be used in medical programs, such as displaying information about viruses, information about the human body, or bringing in doctors from around the world.

However, the hologram technique is used by the needs and content of the TV programs in the director's opinion, there must be a purpose for using it to be employed effectively, and this is what **all the experts have confirmed.**

There are several advantages to the hologram technique. **Osama Al Obiedy, Issam El Dek, Ahmad Abu Hazeem, and Abdullah Gamal mentioned that** this technique is a very important factor in dazzling, and dazzling is an essential component of TV programs, and we can also use it as an explanation tool for certain needs. **Regarding Mahmoud Sabry, Hasan Hina, and Asad Zidan,** this technique provides solutions for a variety of problems, including the distances that allow someone in another nation to be present and interact in real-time. It also brings up deceased celebrities and engages in dialogue with them. This technique is impressive and more attractive to the audience, so when the audience hears about the existence of the hologram technique, this word will attract the audience very much and increase the viewing rate of the TV program because it remains a modern and new technique that has not been used much before. **Ismail Nour El-Din, Mina Amin, and Ahmed Sharif** indicated that this technique strengthens the content, produces creativity (especially in news), lowers the cost of traveling to the guest's location, and preserves the TV program's identity with the audience. As for the disadvantages of the hologram technique, all the experts agree that it is a very expensive technique, has a special setup requiring a variety of equipment, and takes time to implement. It also requires very fast internet speeds.

From the point of view of experts about the future of the hologram technique, **some have confirmed that** the traditional form of TV programs will disappear and be replaced by virtual programs with hologram technique, where its use will be expanded more, and this is because it gives a different spirit and gives a factor of visual dazzle. **Ahmad AbuHazeem, Hasan Hina, and Issam Al-Deek also added that** there will be the development of projector devices that operate Plasma in the air, and this projector will facilitate the wider use of the technique, give a more realistic image, and make the character walk and move naturally. According to **Osama al-Obiedy and Mina Amin,** this technique will turn guests and presenters into holograms and allow them to interact with each other in the same TV studio.

2. **The impact of using hologram technique on TV programs:**

Experts agree that the hologram technique greatly contributes to content clarification. This was evident when this technique was used on the Al-Hayat channel, where the reporter appeared to be discussing details of the elections on the street, or on the ONTV channel, where the reporter discussed aspects of the national youth conference in Sharm El Sheikh. These uses of the technique will make the content more interesting to the viewer, and the more realistic and natural the hologram's shape is, both the image and the information will be clearer and more dazzling to the viewer.

In addition, this technique has affected the form of TV programs, so the content of the program or the segment has become more advanced than before. It used to be hosted with a live guest, and now it is hosted with a virtual guest. This will allow for new ideas for TV programs that have not

occurred before. With the help of this technique, we can bring people who would be difficult to reach together over such broad distances; without it, we would not be able to achieve it. and this is **all the experts concurred with. However, Ahmad Abu Hazeem added that** this technique helps in developing a look for TV programs. Showing that we are using the latest techniques in the world, helps to make the program look modern, use new techniques, and meet advanced needs.

Moreover, **all the experts said that** there is no correlation between the hologram's shape and the studio's decor because the hologram that viewers see is a broadcaster or reporter dressed as he would normally be.

3. **The impact of using hologram technique in the TV industry from a production perspective:**

Regarding the budget when deciding whether to use the hologram technique, **all of the experts highlighted that** this is the most important factor as hologram technique implementation involves many details, such as a large budget that is split into two parts: one for the TV studio, which includes the software and devices, and the other for the reporter or announcer positioned on a green screen on the other side.

The experts all mentioned that the cost of a studio that has been particularly prepared for hologram technique is different a lot. Producing a hologram in a day or several in a single day will be easier with a studio that is fully furnished with lighting, cameras, a green screen, and other recording tools. However, using a traditional studio will require more preparation and lead to higher costs. Due to its one-time expense, this holographic segment will require extra equipment.

All the experts also added that the hologram technique requires certain specifications in the studio space, as the studio needs to be elevated so that the hologram can be captured on camera. This means that if the reporter is in a long shot, the camera will be able to see a green screen next to him or in an area above and below him. This is calculated in the filming work while recording the reporter's photo. **Osama al-Obaidy mentioned that** the quality of the hologram construction improves with greater TV studio areas. Furthermore, he added that not every TV studio could use this technique.

4. **The hologram technique's technical issues:**

Experts explained that there is an extremely low chance of a technical breakdown happening and that the only possible reason for one would be an electrical failure or disruption of the Internet. There can be a delay or disruption while the system is operating, which would result in a connection issue between the sender and the receiver's servers. If there is a problem with the LED light system, like if a character's face is not visible due to the light being damaged, all of these are problems, but they have a very low possibility of occurring.

On the other hand, **experts acknowledged** the feasibility of avoiding technical breakdowns by having a backup engine. The control room performs various testing operations before the program is broadcast live on television. They see the layer's graphics alone and the presenter's view alone. If a malfunction has occurred, the director will be cut off and the backup will be used.

The experts also mentioned that there should be a little difference in the syncing of the delay between the hologram and the broadcaster, but this difference should not be noticed. The delay is generated through a transmission that is coming and going and is captured on camera, and inside the camera there is a mixer. The satellite reflects the signal that originates from the broadcast, and the television building's receiver then transmits the signal. It is visible on two screens: the receiver screen and the direct-to-mixer screen. Three seconds are used to calculate this difference delay. To prevent this, we delay the actual image to make it more similar to the holographic character, and the presence of this delay is based on the location.

5. **Factors that impact hologram technique design in TV programs:**

Based on experts' opinion, there are two reasons why the hologram technique isn't used widely in TV programs: Firstly, the cost. Secondly, the necessary equipment, including the specialized equipment for the remote person's location, needs to be positioned in the center of the green screen. and this green screen requires lighting, lighting experts, and a well-adjusted camera.

Experts explained that the lack of knowledge among those in charge of television and satellite channels is due to their fear of the term "hologram," this is because many individuals mistakenly believe that a hologram is a device and that only foreigners can use it, and this technique is limited to employing in foreign theatres. These are incorrect assumptions, as at this point, holograms are a technique, and technique can only be achieved through the use of tools. Further, **Abdullah Gamal and Ahmad Abuhazeem mentioned that** the lack of awareness among those in charge about the importance of this technique and the benefits it offers compared to international channels in America and Europe is very weak. They simply use a new technique as soon as it appears, checking it over, learning it, and analyzing how it may help them.

Along with the experts, they added that the lack of hologram creators is due to the necessity of someone knowledgeable about the workings of the hologram technique. While viewing a holographic image of someone who isn't in the studio, he is in another place. see the environment inside the studio. Therefore, he needs more than one technical person to understand how this technique works, so he can understand the dimensions and how this image came to him. He needs someone to understand where this reporter, broadcaster, or guest will stand in a place and how the place looks and functions. How is he enlightened? How is the green screen? What's its dimension? The camera used what it looked like. How far is it from the person? This requires a lot of experience and practice, but due to the fear of some software companies paying a large budget for beginner creators, this has led to a lack of experience in this field and limited spread of this technique.

Conclusion

·   There are two ways in which hologram could be used in TV programs: using system lighting or on-air graphics software and this was agreed upon by a study (Liu, 2013) In TV production, high-tech components, including motion capture systems, vizrT software 3D virtual engines, high-performance processors, and camera tracking, are frequently utilized. Motion capture systems use wireless communication methods, sensor technologies, and no area obstacles to capture

activity in real-time. Meanwhile, advanced computers improve image rendering and create more flexible and realistic holographic figures. Real-world scenes and virtual guests merge through camera tracking techniques. Furthermore, (Shoydin & Pazoev, 2023) examines how light reflection on a three-dimensional object transforms with illumination, showing characteristics close to hologram in vertically organized light fringes. Higher compression of holographic data can be sent over the communication channel due to the diffraction's ability to recreate 3D holographic images. This demonstrates the possibility of this method by proving that the TV display frequency of 3D holographic is possible.

·   Therefore, certain research sheds light on whether the use of hologram technique in TV programs is achievable, according to (Park, et.al, 2014) they agreed with employing hologram technique, as mentioned by a 3D broadcast service holographic projection system capable of recreating a sizable hologram in a wide-open area. To present a wide-angle hologram to the viewer.

·   Although study provided by (Sasaki, et.al, 2014) utilized several spatial lighting controls to expand the size of electronic holography-displayed 3D images. enabling the creation of larger-color electronic hologram displays.

·   The use of hologram technique also has many advantages, it allows for the embodiment and merging of virtual and real individuals in TV programming environments and reduces the cost of traveling to the guest's location, while preserving the program's identity with the audience, and the technology acceptance model supports this as it can help TV broadcast designers navigate the use of hologram technique in their programs. By understanding the key factors of perceived usefulness and perceived ease of use. Perceived usefulness is an essential aspect; the hologram technique must improve visual appeal as well as benefit the broadcast designer. Designers must carefully consider how holograms can add depth, interactivity, and visual interest to their broadcast content. Equally important is perceived ease of use. The hologram adaptation should be flexible and natural, without technical barriers or distractions for the viewer. Designers must optimize the hologram employment to ensure an effortless and immersive experience. By addressing both perceived usefulness and perceived ease of use, TV broadcast designers can build a persuasive case for incorporating hologram technique. This attractive approach will help drive audience acceptance and interest in this innovative medium, which will increase the number of viewers watching TV.

·   Additionally, hologram will be used more in TV programs, which will replace traditional formats with virtual shows that provide an immersive visual experience. Projector equipment will improve holographic realism by allowing characters to walk and communicate naturally within the same studio.

·   While hologram technique contributes to the development of the appearance of TV programs, which appear in a new way using the latest technology, it also adds a visual dazzle to the programming and an attractive new design to the viewer who will follow the program in its unconventional form.

·   Also, budget is a major factor when deciding to use the hologram technique because it will cost a lot to set up the TV studio, and creating high-quality holograms requires a well-equipped studio that meets all requirements. And for ideal results, the studio area needs to conform to a set of characteristics.

·   Besides, technical breakdowns in holographic broadcasting are highly unlikely, with the only potential causes being electrical failure or internet disruption. To cope with these risks, backup engines are used, and testing operations are conducted before live broadcasts. Additionally, a slight delay in syncing between the hologram and the broadcaster is necessary but not noticeable to viewers.

·   On the other hand, the main reasons why hologram technique is not widely used in TV programs are the high cost and the need for specialized equipment and expertise. Furthermore, the lack of knowledge and awareness among those in charge of TV channels contributes to the limited adoption of this technique.

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