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Mahmoud Abdulkader Alghafri
Doctor in Cultural Heritage Management
Noor Mahmoud Diab
Fourth year student
Damascus University, Faculty of Tourism,
Department of Tourism Management
Damascus, Syria

EMPLOYING HOLOGRAM TECHNOLOGY IN SYRIAN CULTURAL HERITAGE SITES AND ITS ROLE IN TOURIST ATTRACTIONS

Abstract

Hologram technology is considered one of the modern techniques used in cultural heritage sites, contributing greatly to attracting tourists. This technology allows visitors to interact directly with those sites, using images sounds, and movements that represent various elements of those locations in order to shed light on the history and culture surrounding each site. The research aims to analyze the reality of heritage sites in Syria and to introduce the importance of hologram technology in creating virtual scenes and its role in tourist attractions, in addition to how to apply the technology to create virtual scenes to support tourism. Given the current situation in Syria, hologram technology could be used to highlight the historical and archaeological sites destroyed by war, providing an opportunity for visitors to explore those places, learn about their rich past, increase their cultural awareness, and enjoy themselves. In this way, technology can contribute to reviving cultural heritage and raising awareness of its importance.

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1. **Introduction.** Technological development is increasing day by day, opening up new horizons for us in the tourism sector through the use of hologram technology. The technology will create a new type of exciting tourism experience that provides the visitor with an opportunity to discover a new world and sites of which only ruins remain.

Research problem. Syria has many archaeological sites, which are considered an important tourist attraction. These sites can be exploited in the tourism sector through the use of modern technology, many heritage sites are difficult to access and visit, so technology can be used to create virtual scenes in the area to be studied, from here the research problem revolves around the following questions:

1. Are modern technologies important and required in the tourism sector?

2. How to use hologram technology in tourism?

Research objectives. The research aims to analyze the reality of heritage sites in Syria and to introduce the importance of hologram technology in creating virtual scenes and its role in tourist attractions, in addition to how to apply the technology to create virtual scenes to support tourism.

Methodology of the research. This study relies on the following approaches: the historical approach and the descriptive approach

2. **Hologram technology and cultural heritage**. Virtual reality is an artificial digital environment that completely replaces the real world. Users experience artificial sounds and scenes and feel as if they are in a digital world.

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Holograms are stereoscopic images or holographic imaging, and it can be defined as a technique or device that relies on a group of light waves that is responsible for three-dimensional imaging of objects with high efficiency. Imaging begins when these light waves collide with the target intended to be photographed. The hologram device, in turn, plans the object to be photographed and then transmits information this is due to the dependence of this technology on monitoring the wave of the body, as this device allows the possibility of repeating the creation of wave images again in the event of lighting the hologram [6].

Stereoscopic imaging requires the availability of several requirements, the most important of which is the presence of a specific object to be the point of imaging, in addition to a source of laser radiation so that its beam falls on the target object to be imaged alongside a recording medium to collect the scattered rays from the body[7].

For the success of stereotaxic imaging, it is required that the target object to be photographed is composed of suitable materials and environment to show the stereoscopic image resulting from the intersection of laser beams in its best form. The medium of recording, provided that it does not conflict with the image resulting from the beam reflected from the body to create harmony between them, and implements the target image by means of the hologram [12].

3. Areas of use of hologram technology.

1. Arts: It is one of the most enjoyable uses of the hologram technology, as many artists were involved in photographing their works through it, and many ancient works of art were embodied and presented to recipients in theatrical performances such as the photo exhibition that was held in London [4].

2. in the field of education: which made the educational process more sophisticated, as it enabled learners and students to attend lessons as if they were present inside the classroom [2].

3. in the field of marketing: by making three-dimensional models of products that the user can preview in the real world and in real size

4. Water Museums: Imagine the sea world through the use of virtual reality and projection technology [1].

5. Tour guide: a virtual guide will roam with the visitors [2]

4. The importance of hologram technology in tourism science:

The role of technology in creating virtual museums. Hologram technology is used in stereoscopic exhibitions by displaying 3D models in space via transparent media to fully simulate original artifacts and blend into the surrounding space. This was used by the Heritage Documentation Center to mimic the original mask of Tutankhamun during its restoration so that museum visitors can see the mask and its details as precisely and clearly as the real mask [11].

In addition to the possibility of displaying the pieces that the restorers could not restore or the pieces that were completely lost, which were used by the Museum of Islamic Art to display two enamelled glass bottles from the Mamluk era, which are among the rarest archaeological glass in the world [12].

Reconstitution of movable tangible heritage. The technology can bring famous personalities from the past back to life to talk about themselves, as we can bring any character from the studied site as a 3D guide to accompany visitors on the tour in the museum. In the Egyptian Museum in Cairo after the transfer of heritage, whatever it

is, it must be documented, as the documentation and registration process is one of the most important procedures that guarantee the preservation and protection of either buildings or artifacts and sites [9]. It is necessary to preserve history and data because the documentation process is an identification card of the original and current value and condition. Therefore, the preservation process must be based on a study a comprehensive understanding of the conditions experienced by the tangible heritage, either movable or immovable, because the process of archaeological documentation is a complex process that includes several stages of collecting historical, design and construction information to reach the final result. Documentation is also considered the first and most important step that precedes the process of preservation, maintenance and restoration [8].

In National Museum of Damascus, we can apply to two artifacts, in principle, the first piece is the head of a stone statue from the early first century in Amrit, where its height is 10 cm. The hair is in the form of hairlines up to the neck, and the features of the face are distorted and unclear. Here, by using the hologram technology with artificial intelligence technology, the features of this head can become clear, so we have a clear three-dimensional projection [3-5].

The second model is the statue of Minerva, the goddess of war and wisdom, which was found in the city of As-Suwayda, where she wears a high war helmet and holds an oval shield in the middle of which is the head of a Gorgon and raises her hand that once held a spear, and on the base on which she stands are written (for the health of our ruler). In this model, virtual reality and augmented reality can be combined to fully form the statue, while she holds the lost spear in her hand. The translation of the writing can be displayed in the base on which she stands and placed in the projection model to be made [10].
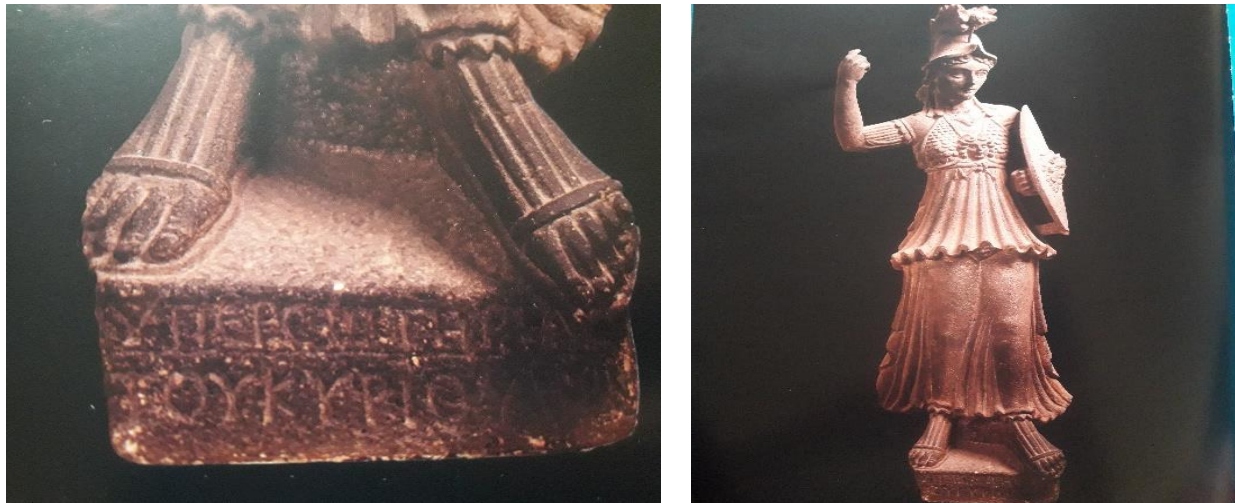

Fig. 1- Minerva statue [4-7].

Virtual scene industry.

It is done through augmented reality, as it must present three-dimensional images and allow them to be viewed from any angle according to the user's perspective. Stereoscopic image quality has evolved greatly over the years as improvements have been made in the process of replicating visual effects such as textures, shadows, and transparency (Fig. 2) [4].

All output devices are designed for use by one person, but other devices allow use by several people to give an experience of augmented reality at the same time. For example, large panoramic screens can be equipped to provide a visual experience that many users can share. Special glasses can also be used to view three images. The dimensions are displayed through a virtual table or a computer-supported virtual medium such as the (CAVE) system, so that it projects this image on all sides inside a closed room, and when virtual images are placed or superimposed on the real

reality, through augmented reality (AR), then users can Share the experience (Fig. 3). [5].

Fig. 2- VR glasses picture [7]

Fig. 3- Virtual reality show [6]

5. research results

1. The results of the study showed that the use of hologram technology in cultural heritage sites may lead to opening new horizons in the field of tourism.

2. The study showed that it is possible to focus on the issue of community awareness about the importance of technology in the tourism sector.

3. The results showed that it is necessary to include at least one hypothetical site in a plan for a tourist route in the Syrian cities.

4. The study indicated the need to activate the role of the National Museum in Damascus to create virtual scenes of heritage sites

6. References

1. Abdelhamid, Manal (2020). Using 3D hologram technology (3DHT) in the distane learning program to enhance the professional skills of tour guidance undergraduate students, Journal of association of Arab universities for tourism and hospitality, Vol. 18, No 3.

2. Alakhtar R. (2020). Using Augmented Reality to Explore Museum Artifacts 2020 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct). No.10. p.295-299.

3. Aristova U, Rolich A, Staruseva-Persheeva A and Rolich A. (2020). Digital Museum Transformation: From a Collection of Exhibits to a Gamut of Emotions. Digital Transformation and Global Society. No.31. p.419-435.

4. Frey B and Briviba A. (2021). A policy proposal to deal with excessive cultural tourism. European Planning Studies. 10.1080/09654313.2021.1903841. No.29:4. P. 601-618.

5. Gheorghiu D, Ştefan L, Moţăianu M and Samuelsen G. (2022). Rhythms in Stone: Revealing and Augmenting the Human Presence in Mesolithic Rock Art. Augmented Reality Art. No.19. p.349-365.

6. Isabel Pedersen, Nathan Gale, Pejman Mirza-Babaei, Samantha Reid (2017). More than Meets the Eye: The Benefits of Augmented Reality and Holographic Displays for Digital Cultural Heritage, Issue 221, No.11, p 1–15.

7. Lee Y, Lee J, Ahmed B, Son M and Lee K. (2019). A New Projection-based Exhibition System for a Museum. Journal on Computing and Cultural Heritage .No. 12:2. p. 1-17.

8. Pratisto E, Thompson N and Potdar V. (2022). Immersive technologies for tourism: a systematic review. Information Technology & Tourism. 10.1007/s40558-022-00228-7. No.24:2. P.181-219.

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9. Safy eldeen, Ahmed, Hussein, Fatma (2020). Using hologram technology in constructing virtual scenes in archaeological sites to support tourism In Egypt, Journal of Architecture and the Human arts, Vol. 20, No5.

10. Wu J, Zhu J, Zhang J, Dang P, Li W, Guo Y, Fu L, Lai J, You J, Xie Y and Liang C. (2023). A dynamic holographic modelling method of digital twin scenes for bridge construction. International Journal of Digital Earth. No 16. p. 2404-2425.

11. Zhang J and Bryan-Kinns N. (2022). QiaoLe: Accessing Traditional Chinese Musical Instruments in VR 2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW). 10. p.357-362.

12. Zhu Y, Liu M, Lou Z, Li R, Tie Z, Huang W and Diao Q. (2023). Vitalizing cultural memory with immersive data storytelling 2023 IEEE Conference on Virtual Reality and 3D User Interfaces. No.10, p. 468-473.

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