

# Research on the Application of Virtual Reality Technology in the Cultural Exchange of Tourist Attractions Under the Background of Artificial Intelligence

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## ABSTRACT

Virtual reality is an immersive interactive technology that captures the entire location within 360 degrees with the help of special cameras, mounts and software. This paper discusses the role of artificial intelligence technology and virtual reality technology in the cultural communication of tourist attractions. In tourist attractions, VR technology provides a glimpse of information about the tourist attraction with the help of VR photography and VR video. This study provides a new idea for the design of interactive cultural communication devices and uses supervised learning algorithms to make their versatility and interactivity fully reflected in the communication effect. The results of the study show that by using supervised learning algorithms, artificial intelligence based virtual reality provides 97% high accuracy.

## KEYWORDS

Artificial Intelligence (AI), Cultural Communication, Immersive VR (IVR), machine learning, Modeling, Supervised learning algorithm, Tourist Industry, Virtual reality (VR)

## INTRODUCTION

It has been discovered that virtual reality (VR) technology has a wide range of possible uses, and that intelligent media advertising made possible by VR technology fits with the way the advertising industry is growing. It uses VR technology to look at how 3D advertising and interactive advertising fit together in the smart media era. In the second phase, we figure out how VR will change as a means of advertising in the age of smart media. Research on integrating 3D animated ads and interactive ads with VR technology precedes this study. Thus, this study focuses on the 3D stereoscopic and interactive design of ads in the age of smart media and looks at and explores the future language of advertising design. When people talk about “Culture and Tourism Integration,” they are mostly referring to the phenomenon in which people visit a beautiful area and witness both culture and tourism at work (Zhang et al., 2022) in harmony. Tourists may now have a better experience in a gorgeous

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location thanks to the fusion of these two components of a locale. It is also possible to think of it as a collection of numerous products and services. The cultural and natural aspects of a picturesque area may successfully increase the number of visitors coming to the area, as well as enhance the employment and economic growth of local businesses. Cultural attractions and natural wonders may also add to a town or city's inviting appeal (Wang et al., 2022).

With the globalization of the digital economy industry, tourists from all over the world are generating a huge stream of data, as well as sensors, devices, and camera stages in tourist destinations across the country, which provides a good basis for improving the personalized and valuable services provided by tourism companies (Aguiar-Castillo et al., 2021). Distinctive and aesthetically appealing locations may also be more properly categorized by tourist management. The cultural features of picturesque sites may influence the use of local resources. For example, in picturesque places where tourists must participate in mountain climbing to visit, tourists will seek the appropriate mountain climbing gear and the familiarity with cultural traits from the locals, thus boosting an interchange and a utilization of local resources.

In addition, culture and tourism are integrated in a subtly woven fashion (Gan et al., 2021). The International-Communication-Organization (ISO) specified wireless data transmission technology. It is a wireless data transmission standard. By eliminating the need for wires and other conductors, it can transmit signals. Bluetooth, RFID, Wi-Fi, and ZigBee are among the most widely used wireless communication technologies today. Artificial intelligence is a widely used methodology used for accessing locations and transmitting data.

Make full use of the Internet of Things (IoT) to alter the conventional tourist industry's inefficient linkages and to enhance the effectiveness of tourism marketing by integrating IoT with traditional tourism marketing methods (Gan et al., 2021). Tourism may be better protected by using wireless communication technologies. Tourists may still get lost in picturesque areas because of the difficult terrain and inclement weather that prevails at the time of writing.

A strategy known as "virtual tourism" is now making its way into the public's field of view using VR technology, meaning that actual people may travel without physically seeing the location and yet have the same trip experience, and hardware-based implementations are the primary means of realizing it (Kowalczyk-Anioł et al., 2021).

In tourism, VR allows people to explore all the important places they wish to visit and determine where they are in advance. Tourists can also take a look inside famous places to see if they want to walk through them in real time. However, visitors are not the only ones who may use wireless communication technologies to submit their own location information (Gan et al., 2021). Tour guides and other workers in scenic locations can also easily locate visitors using drones and other technologies. By using visual simulation and other technologies, VR users can see things projected into their field of view through their VR headset (Gan et al., 2021).

With the use of an integrated processor and algorithm, it can analyze the user's perceptions by capturing their eye motions and their motions as they occur (Luo & Zhou, 2021). Cultural and tourist development will benefit greatly from using VR technology. If people have ever wondered what it would be like to walk around the Old Summer Palace, they can now do so. It is possible to use VR to let tourists re-experience the Old Summer Palace's splendor, as well as its devastation and looting during the Eight-Power Allies' invasion of China in 1937 (Wang, 2022).

To facilitate the integration of culture and tourism, tourist attraction management should set up the necessary hardware infrastructure to support such integrations. This hardware includes VR wearable gadgets, wireless connectivity base stations, and transportation and sanitary facilities (Su & Meng, 2021). Visitors should be able to experience the cultural and historical qualities of a beautiful region via wireless communication and entertainment services, so tourists can help support these scenic areas financially, and thus help them grow (Sarker, 2022). The quality of tourism was not given as much consideration as it is now. However, culture and tourism integration is still in the experimental stage. For each picturesque location, there is no one reference of the norm, and the level of integration

and growth of each component (culture and tourism) varies across destinations (Rudwiarti et al., 2021). Nevertheless, tourists and locals alike are quickly embracing the idea of combining the two.

The author of this study used the QUESTIONSTAR website to send out a survey to 500 people who are responsible for long-term tourism across different businesses and the administration of the surrounding region in the touristic area (Wang, 2021). According to statistical results, factors impacting the growth of culture and tourism in the area include money and the number of people working in the business. Additionally, scenic areas, entertainment, and tourist revenue have the largest impact on cultural and tourism development. All picturesque sites now operate in the same manner. In addition, a number of picturesque sites have organized specific product trails, snack areas, wine villages, and handicraft workshops in order to combine culture and tourism into the experience (Zhang & Mao, 2021).

It is only that the gorgeous sites are not equipped with cutting-edge technology. Tourists are expected to pay for their own admission to most picturesque attractions. At the entrance to a few picturesque sites, sophisticated temperature monitoring, intelligent robot security inspection, and other equipment are installed (Gan et al., 2021). Tourists have not benefited from the technological advancements that have been extensively adopted by other businesses. Tourist attractions' present technology takes a long time to replace creatively, and it will be obsolete as soon as a new one comes. The level of originality is low, but it can convey the cultural traits of the pictures site (Tidd & Bessant, 2020).

Cultural and tourist integration necessitates the employment of more modern technologies to stay abreast of technological leapfrogging. Integrating a variety of historical data, the study of nearby culture and tourism reveals a strong connection between scenic spot culture and tourism. Nevertheless, there are not many significant cultural industry companies participating in the operation of contemporary tourist sites. In each picturesque area, only the government and individual merchants are interested in the integration of culture and tourism (Liu et al., 2020). They did not get professional technology and resource research and development institutes involved. Since most in-hotel businesses only knew about mobile payment, they were unable to take advantage of new technologies like wireless communication and virtual reality (Erdem & Barakazi, 2023), which are critical for the advancement of business and for attracting tourists from outside the area (Liang et al., 2022).

The absence of a single tourist management platform for the dissemination and management of information for the integrated development of cultural tourism means that there will be no personalized features and an abundance of picturesque spots if the tourism market patterns of surrounding locales are identical. They do not even offer an in-depth introduction to their culture, which is a shame. Visitors rely on their own use of intelligent networks to locate and comprehend the current circumstances of their travel destinations when travelling to a new location (Zhang et al., 2022). Tourists are no longer organized according to interests at the vast majority of modern tourist destinations. Historical occurrences are arranged according to their date of occurrence. Upon exiting the attraction, visitors are restricted to taking in the surrounding scenery without learning more about the historical significance of the locations. Most travelers are eager to go back to their lodgings after seeing several sights. It is possible to make some lasting impressions (Holloway & Humphreys, 2019).

In addition to purchasing culturally relevant figurines, some visitors may snap photographs of themselves doing over-the-top stunts at the site. However, many visitors forget to snap photographs while on the trip, or their mobile devices run out of battery power (Greengard, 2015). They regret leaving before they had a chance to snap photos. As a result of the growing popularity of travel, the majority of domestic tourism is now focused on knowledge. This research suggests a new way to design interactive cultural transmission equipment so its universality and interactivity are fully reflected in its communication effect. The content of the study is still centered on the interactive virtual cultural transmission based on VR space, which produces the communication site feel more real through basic interactive design. The research will focus on analyzing and summarizing the types and characteristics of symphonic cultural transmission in order to fully understand how image and

modern cultural transmission affect and are affected by each other. These people have not improved their intelligence in the slightest. There is nothing like it for tourists. Most tourist attractions are described as “smart tourism,” but the cultural connotation of these attractions is often not properly explained (San Martín & Herrero, 2012). It is exclusively for visitors who want to learn about the game while having fun with it. In addition, holidays such as May Day and National Day make the game play procedure more difficult (Xu et al., 2015). A lot of people are visiting. In some of China’s most popular tourist destinations, people will be surrounded by other visitors every few feet. Traveling may be a whole new experience, even for those who have never been there before. Both the merging of culture and tourism and the two concepts themselves are somewhat recent (Du Cros & McKercher, 2020). Additionally, many visitors have had difficulties after entering the picturesque region, since they did not have navigational work completed.

An intelligent measurable platform has been proposed to utilize cultural exchanges in tourist attractions and incorporate venues and VR technology through engaging live gaming, from which we have conducted an aerial experiment to assess the effectiveness of each application and unfold the preliminary conclusions. This study provides a new way of thinking about the design of interactive cultural communication devices so their versatility and interactivity can be fully realized in their communication effects. The study remains centered on interactive virtual cultural communication based on VR space, where basic interaction is designed to make the communication situation feel more authentic.

## **RELATED WORKS**

A study by González-Rodríguez et al. (2020) examines how well tourists experience a destination with a rich cultural legacy when they use a virtual tour-based tourist product. The study is supported by the growing desire from travelers for a memorable trip as well as the expanding selection of augmented reality (AR) and virtual reality applications in the travel industry. The database is made up of internet reviews collected from people who travelled to Seville and Barcelona, two popular tourist attractions in Spain that already employ immersive VR technology called Past View. A study by Han et al. (2019) examines the factors influencing the visitor experience in the context of cultural tourism from a theoretical standpoint by talking about how VR and AR technology affects the visitor’s learning experience. It makes contributions to the fields of consumer psychology and cultural tourism by talking about how engaging technology might improve the visitor experience at tourist attractions. Through purpose-driven design, additional research in the field of VR and AR development is highlighted. The research of Bec et al. (2021) attempts to investigate the viability of developing tourism experiences in locations and sites that have experienced over tourism, deterioration, and even destruction. The concept of “second chance tourism” and the importance of cutting-edge preservation techniques like incorporating virtual and mixed reality with efforts to enhance tourism are introduced in the paper in order to accomplish this goal. Based on the suggested structure, the data collection will offer suggestions for site preservation and effect mitigation through a second opportunity to ease strain on naturally fragile sites. The research of Zeng et al. (2022) shows a VR travel experience could encourage travelers’ desires to spread culture. It achieves this by creating a moderated mediation model to examine how digital technology is used in VR tourism to improve tourists’ experiential value, boost their pride, and ultimately influence their intent for cultural propagation behavior. Results from a sample of 359 respondents reveal that pride acts as a mediating factor in the relationship between VR experiencing value and visitors’ cultural diffusion activity, which can be used to boost this behavior. The relationship between VR experiencing value and pride is further moderated by the cultural value of individual collectivism. This research has ramifications for destination marketing and VR architecture in addition to expanding the theoretical understanding of VR tourism from an emotional standpoint. An article by Trunfio et al. (2022) aims to close this gap in the literature by examining how the innovation of museum service aspects (exhibition content, VR

and AR, general organization, and reception staff) can improve visitor experiences and satisfaction, creating opportunities for the development of novel museum service models. A random sample of 739 museum visitors who had just seen the “The Ara It Was” project at the Pacis Museum in Rome were subjected to a quantitative survey approach including correlation analysis, importance-performance analysis (IPA), descriptive statistics, and cluster analysis. The research of Garipağaoğlu-Uğur and Akov (2022) assesses how well AR and VR are used in tourism from the perspectives of cultural heritage and deep diving. This article adds to the body of literature by illuminating a novel method for sustainable travel. A common tourist activity is commercial diving to an underwater historical site. Thus, the rescue of shipwrecks can occasionally endanger cultural heritage. The review’s findings suggest that in order to promote sustainable tourism, these undersea cultural heritage places need to be preserved. The sustainability of cultural heritage is enhanced by virtual tours. On the other hand, recreational diving and treasure hunting excursions could harm the ancient sites. Cultural heritage assets underwater must be safeguarded to promote sustainable tourism. Culture communication and promotion depending on the interactive experience of Unity3D space can construct the cultural resources of symphonic culture into an interactive three-dimensional scene to show how symphonic culture looks. Using simple mobile phones, users can connect with objects in the virtual world. This makes users feel like they are in the real symphony surrounding, which can not only fulfil the perception but also allow them to interact with the experience, which is also better for getting the younger generation interested in learning about symphony culture. Tourism marketers can experiment by using VR and AR applications to promote a tourist location. Authors Melo et al. (2022) examine the effects of such multimodal VR setups and gender on the user’s sense of presence, contentment, emotions, and attitudes to produce insights into the effects of such VR technologies. The two VR configurations (audiovisual vs. multisensory) were compared taking into account the user’s gender in user research with a gender-balanced sample (N = 80). Results showed that the female sample performed considerably better in terms of spatial presence across VR settings and that they were more engaged and present overall in the audio-visual condition.

A study by Triantafyllidou and Lappas (2022) created a conceptual model based on literature analysis that takes significant antecedents into account that may have an impact on tourists’ inclination to use mobile AR gamified applications for a tourism site. Additionally, the reactions of tourists to the use of serious tourism games were also noted. The proposed model implied that environmental elements pertaining to the application’s layout and its technological properties, as well as the features of users’ smart mobile devices, may have an impact on tourists’ intentions to utilize serious AR games for tourism. The research of Chang and Chiang (2022) aims to understand how flow experience affects destination image and examine how destination image mediates the effect of flow experience on attitude changes. VR will be used as a communication platform to explore the impact of tourism destination images and the variations in destination attitude.

The research of Gegung (2021) examines the usage of VR as a replacement for real-world experiences in the wake of the COVID-19 pandemic in an effort to boost destination sustainability. It starts out by providing a quick history of how the COVID-19 issue affected the travel and tourism sector. The data is then gathered through archive research or document examination, allowing for the possibility of topic and content analysis. This study demonstrates that artificial intelligence (AI)-VR is seen as a practical tool for promoting the sustainability of tourism sites, not only from an environmental and cultural standpoint but also from the host communities’ economic perspective by creating alternative sources of income.

## Motivation for the Study

In terms of aesthetics and gameplay, VR technologies in cultural communication are constantly increasing, but customers’ expectations imply that more enticing gaming applications are required (Hussain et al., 2023). The specifications of new gaming implementations based on the collision detection algorithm with AI technique are experimentally tested, and a classification of the most

critical game design difficulties is shown. An interactive experience engine is constructed, and a classic double arcade game is named. The breakthrough season is transferred as a research case, to better understand not only the challenges surrounding cultural communication at tourist sites but also in VR gaming. A control mechanism between the application's visual effects parts is supported here, depending on Newton's laws of physics (White, 1984). To assess the utility of our methodology, people propose an intelligent measurable platform for having engaging live games by leveraging cultural exchange in tourist attractions, visiting places, and VR technology. An aviation experiment was conducted to assess the effectiveness of each application, and the preliminary conclusions of the study are also displayed. This study provides a new way of thinking about the design of interactive cultural communication devices, so their versatility and interactivity can be fully reflected in their communication effects. The research is still centered on interactive virtual cultural communication based on VR space, which makes the communication place feel more real through basic interaction design.

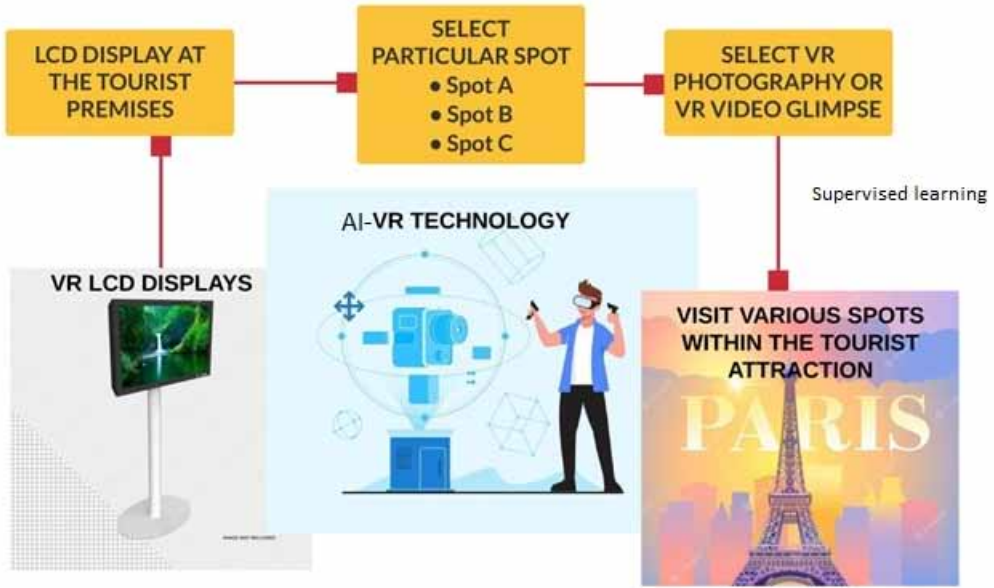
## MATERIALS AND METHODS

The proposed system in Figure 1 makes use of liquid crystal displays (LCDs) showcased at various important spots at the premises of the tourist attraction. The VR technology is deployed by acquiring the VR photographs and VR video glimpse of that tourist spot to feature the LCD display guide. The VR tourist experience is slightly different from our proposed system. VR tourism offers a virtual travel experience to the visitors as if they have travelled to the tourist attraction in the reality. The 360-degree VR tour will be a memorable experience for the users. Many tourist companies have started to utilize this cutting edge technology. In our proposed system, the VR assists the tourists to select important spots to visit and guides them to concentrate on the important features of the tourist spot. Moreover, it is also used by the hotel industry to attract tourists to select their hotel by providing VR tours of their accommodations, so the customers can book the hotel by experiencing the VR tour beforehand. The VR technology makes use of AI-based special cameras called omnidirectional cameras, which have the capacity to film a whole 360-degree scene. Head-mounted displays like these can use either an LCD or an organic light-emitting diode (OLED). Despite the technical differences between OLED and LCD display panels, and in addition to consumer preference for their use in portable electronic devices, manufacturers consider OLED technology to be the best choice for VR experiences, reducing blurring and ghosting. Currently, OLED is the best option because it has a fast response time, which helps reduce image blurring and latency, but it does have flaws. OLED is a device that is powered by a current, so images get burned into the display, and they have a shorter lifetime in exchange for their high brightness. On the other hand, LCD is a voltage-driven device that has high resolution, high brightness, a long life, and a low cost, but its response time is about 1,000 times slower than that of OLED. Figure 1 represents the proposed model for VR technology in tourist attraction.

The adoption of immersive technologies has become increasingly popular in recent years, especially with the emergence of VR applications. From VR headsets to 360-degree videos on mobile devices or programmatic applications for VR, a wide range of possibilities has emerged in the tourism industry, and more opportunities for innovation are still emerging.

A VR video can be viewed without the VR headset in any device such as mobiles, laptops and LCD displays, as stated in our proposed system, but it is much more immersive when it is viewed through a VR headset. Communication is the most important tool in the transfer of information. Cultural communication uses various communication methods to share information with the community. In our case, cultural communication utilizes AI-based VR technology to share information about the tourist spots within a particular tourist attraction through LCD displays installed at various locations on the premises. Each spot has unique features to be explored. In larger tourist attractions, LCD displays are kept at various spots. These displays feature VR photography and VR video glimpses of the spots present within the tourist attractions. The tourists can select the spots and view the details with the

Figure 1. Proposed Model for AI-based VR technology for tourists attraction



help of VR photography. A 360-degree view of a particular spot can be viewed before visiting that spot in person. This guides tourists by helping them concentrate on important features of a specific spot. Likewise, VR video glimpses provide clear cut information about the tourist attraction, so that the tourist will not miss certain highlighted details. Thus, it is found that AI-based VR technology enhances cultural communication in tourist attractions. In ensuring there is holistic insight into existing socio-technical opportunities, we advocate the development and deployment of immersive VR experiences that help society as a whole to connect with destinations in a richer and more human way, while solidifying the original purpose of the tourism industry.

Developments in artificial intelligence are increasingly permeating digital tourism research itself. Whereas the use of supervised learning algorithms permits a wide range of prediction and classification tasks, these data-driven methods have a strong tradition of quantitative research in tourism studies.

### Supervised Learning Algorithm

$T_0$  represent  $E_0$  the time the price limitations of player, respectively, while  $\tilde{\theta}_j^{-i}$  is an estimate of a grand total of offers from other competitors. The effects of price are highlighted by (2) and (3) and the time it takes for player I to make an offer. Both of these equations demonstrate that the classification bid  $e_{in}$  in is determined by (1), comparing it to the prior competitive ( $j < n$ )  $\tilde{\theta}_j^{-i}$  of competitors. Please present  $\theta_n^{-i}$  and the future  $\tilde{\theta}_j^{-i}$  ( $j > n$ ).

$$\tilde{\theta}_j^{-i} = \sum_{i=1}^{j-1} \tilde{\theta}_1^{-i}, \dots, \tilde{\theta}_n^{-i}, \tilde{\theta}_{n+1}^{-i}, \dots, \tilde{\theta}_m^{-i} + \sum \tilde{\theta}_j^{-i} \quad (1)$$

In which  $\tilde{\theta}_{n+1}^{-i}, \dots, \tilde{\theta}_m^{-i}$  is an estimate of competitive tenders, it is assumed, but others in the network remain intact, to simplify thinking and problem solving; as a result, the game is depicted as a static play with complete information. However, since such matters are even more in  $\tilde{\theta}_j^{-i}$  ( $j > n$ ) AI-based VR, but also contenders try to acquire its maximum utility, in practice, our expertise of the

environment is imperfect, so  $F(\Theta | \Theta_n)F(\Theta)d\Theta$  a guesstimate of the sum total of buyers by other contenders, particularly in comparison to their own past era, must be obtained.

Based on the past  $F(\Theta)$  and its consistency function  $F(\Theta / \Theta_n)$ , as shown below in (2), the supervised learning method can be used to calculate  $F(\Theta | \Theta_k)$ . It is an AI technique. The nearest quantity of energy price could be expected using probabilistic learning, and subsequent bidders could be estimated as a result on following (3) and (4).

$$F(\Theta | \Theta_k) = \sum_{F=1}^n \frac{F(\Theta | \Theta_n)F(\Theta)}{\int F(\Theta | \Theta_n)F(\Theta)d\Theta} + \sum \tilde{\theta}_j^{-i} (j > n) \quad (2)$$

$$\tilde{\theta}_{n+1}^{-i} = D(\Theta | \Theta_k) - D(e^i) \quad (3)$$

$$\tilde{\theta}_{n+1}^{-i} = D(\Theta | \Theta_{m-1}) - D(e^i) \quad (4)$$

While  $D(e^i)$  represents the vector of bids made by player  $i$ , to estimate (5), the three parameters  $\alpha_n^i, \beta_n^i$  and  $\gamma_n^i$  are described as direct competition  $t$  is represented in (6) and (7).

$$\alpha_n^i = \sum_{j=1}^{n-1} C_j^i \theta_j^{-i} + \sum_{j=n+1}^m C_j^i \tilde{\theta}_j^{-i} \quad (5)$$

$$\beta_n^i = \sum_{j=1}^{n-1} C_j^i \sqrt{\theta_j^{-i}} + \sum_{j=n+1}^m C_j^i \sqrt{\tilde{\theta}_j^{-i}} \quad (6)$$

$$\gamma_n^i = \sum_{j=1}^{n-1} C_j^i + \sum_{j=n+1}^m C_j^i \quad (7)$$

By replacing  $C_j^i$  for  $F_n^i(\Theta_n)$  in (8), the function  $F_n^i(\Theta_n)$  is obtained as described.

$$F_n^i(\Theta_n) = \frac{(D_0 - \alpha_n^i - c_j^i \Theta_n)^2}{2(\beta_n^i)^2} \left[ \sqrt{1 + \frac{4(\beta_n^i)^2 \Theta_n}{(D_0 - \alpha_n^i - c_j^i \Theta_n)^2}} - 1 \right] \quad (8)$$

In fact, feature  $F_n^i(\Theta_n)$  indicates that bidders' dependence is not simply on the budget, but that the  $4(\beta_n^i)^2 \Theta_n$  amount determined to offer may change in the next stage related to variation in duties. Finally, by simplifying  $(D_0 - \alpha_n^i - C_j^i \Theta_n)$  the preceding (9) the derivation will also have

$$A_j = A_{ij} \sqrt{\frac{\theta_n^{-i}}{\theta_j^{-i}}} .$$

2D – A comparable byproduct in terms of the value parameter

$$A_j = \frac{L_0 - \sum_{j=1}^{m-1} N_j^i \theta_j^{-i} - N_m^i \theta_m^{-i} - \sum_{j=m+1}^n N_j^i \theta_j^{-i}}{\sum_{j=1}^{m-1} N_j^i \sqrt{\frac{\theta_j^{-i}}{\theta_m^{-1}}} + N_m^i + \sum_{j=m+1}^n N_j^i \sqrt{\frac{\theta_j^{-1}}{\theta_m^{-i}}}} \quad (9)$$



3D — A similar consequence in terms of value variable the following (10),

$$A_m = \frac{\sum_{j=1}^{m-1} N_j^i \sqrt{\theta_j^{-1} \theta_n^{-i}} + N_n^i \theta_n^{-i} + \sum_{j=n+1}^n N_j^i \sqrt{\theta_j^{-i} \theta_n^{-i}}}{A_0 - \sum_{j=1}^n N_j^i} \quad (10)$$

By replacing  $C_j^i$  in (11) using  $\Theta_n - e_m$ , the feature  $g_n^i(\Theta_n)$  is produced, which constructs the  $2(A_0 - \gamma_n^i)^2$  offer regarding the time limitation.

$$g_n^i(\Theta_n) = \frac{C_j^i}{A_0 - \gamma_n^i} \Theta_n + \frac{\sqrt{(\beta_n^i)^2 + 4(\beta_n^i)^2 (A_0 - \gamma_n^i) - (A_0 - \gamma_n^i - C_n^i) \Theta_n}}{2(A_0 - \gamma_n^i)^2} - \frac{(\beta_n^i)^2}{2(A_0 - \gamma_n^i)^2} \quad (11)$$

This  $2(A_0 - \gamma_n^i)^2$  increased conformity gender equity function is reliant on and illustrates that because  $\frac{C_j^i}{A_0 - \gamma_n^i} \Theta_n$  no financing limit is reached for the purchase cost, this can keep increasing restrict and also time limit, which would be written even though follows (12) if  $\theta_j^i$  is assumed also as payoff, only those players are likely to have the fastest task execution. As a result, the best option has the lowest payoff. On the other side, if the cost is treated as a payoff  $F_j^i$ , the most expensive strategy consistently outperforms alternative methods.

$$\varphi = \frac{(\rho_e, \ln \sum_{j=1}^n F_j^i + \rho_t \ln \sum_{j=1}^n \theta_j^i)}{\rho_e} \quad (12)$$

So, because goal among all players  $i$  is  $\min \varphi$  would be to save time & expense, a players ability attractiveness purpose is minimal the following (13).

$$player \text{ to } \sum_{j=1}^n A_j^i \leq L_0, \sum_{j=1}^n F_j^i \leq G_0 \quad (13)$$

In obtaining the resource provisioning using (14),

$$G = \varphi + \theta_e^i \left( \sum_{j=1}^n A_j^i - L_0 \right) + \theta_t^i \left( \sum_{j=1}^n F_j^i - g_0 \right) \quad (14)$$

$$\frac{\partial G}{\partial A_{ij}} = \sum \frac{\rho_e}{\rho_e + \rho_t} \cdot \frac{N_j^i}{\sum A_{ij}} - \sum_{i=1} \frac{\rho_t}{\rho_e + \rho_t} \cdot \frac{N_j^i \theta_j^{-1}}{\sum F_j^i A_{ij}^2} + \sum_{N=1} \theta_e^i N_j^i - \theta_e^i N_j^i - \sum_{j=1} \theta_t^i \frac{N_j^i \theta_j^{-i}}{A_{ij}^2} = 1 \quad (15)$$

The  $\frac{\rho_e}{\rho_e + \rho_t}$  first section of the questionnaire comprised multifunctional questions aimed at evaluating users' attitudes about  $\frac{N_j^i \theta_j^{-1}}{\sum F_j^i A_{ij}^2}$  various types of games, such as traditional and cultural

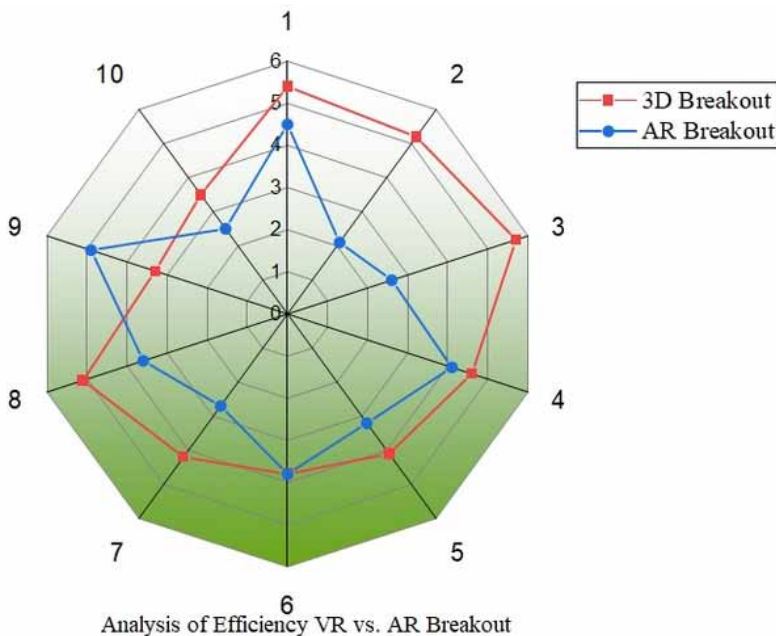
communications in major tourist games. It is  $\theta_e^i N_j^i - \theta_e^i N_j^i$  important to note that there is a whole generation of children that grew up with AI technology, and consequently, they are expected to be more supportive (15).

It  $N_j^i \theta_j^{-i}$  is unmistakable that 80% prefer to play computer games, while 70% prefer to play culture and communication games at tourist attractions. Surprisingly,  $\rho_e + \rho_i$  just 54% of people regularly play traditional games, whereas 62% choose cultural communication through tourist attractions games. This is an  $\sum F_j^i A_{ij}^2$  intriguing statement, since, having lived in a culture where communication process in tourist hotspots games arise, consumers continue to choose older games. However, most gamers would choose online games owing to a variety of considerations (including cost, exhilaration, accessibility, and visual effects). Without a doubt, mixing traditional and gaming consoles appears to give an alternative response to customers' needs.

## RESULTS AND DISCUSSION

The first correlation compares the efficiency of the stream processors in the two experimental application areas (see Figure 2).  $T_0$  and  $E_0$  represent the time the price limitations of player  $I$ , respectively, while  $\tilde{\theta}_j^{-i}$  is an estimate of a grand total of offers from other competitors. The effects of price are highlighted by (2) and (3), and the time it takes for each player to make an offer. Both of these equations demonstrated that the classification bid  $e_m$  in is determined by (1), comparing it to the prior competitive ( $j < n$ )  $\tilde{\theta}_j^{-i}$  of competitors. It is significant to present  $\theta_n^{-i}$  and the future  $\tilde{\theta}_j^{-i}$  ( $j > n$ ) based on to retrieve in Figure 2 clearly illustrates the user response that includes the AI-VR split (Mean = 5.4, SD = 0.98302, SE = 0.41351) that is substantially more efficient than the AR breakout (Mean = 3.7, SD = 2.35565, and SE = 0.48324).

Figure 2. Analysis of efficiency VR vs. AR breakout



This was a foregone conclusion (see Table 1) because the 3D breakout requires less processing power than the AR breakout as a result of cultural communication in tourist attractions and image processing, and AI activities, such as automating and finding out the pointed locations in tourist attractions.

In which  $\tilde{\theta}_{n+1}^{-i}, \dots, \tilde{\theta}_m^{-i}$  is an estimate of competitive tenders, it is assumed, but others in the network remain intact, to simplify thinking and problem solving; as a result, the game is depicted as a static play with complete information. However, since such matters are even more in  $\tilde{\theta}_j^{-i} (j > n)$  the reality but also contenders try to acquire its maximum utility, in practice, our expertise of the environment is imperfect, so  $F(\Theta | \Theta_n) F(\Theta) d\Theta$  a guesstimate of the sum total of buyers by other contenders based on to retrieve in Figure 3.

The second relationship aims to evaluate the overall utility of two different prototypes in order to determine who is more pleasurable to play with. As according to Figure 3, there is no clear preference for user activity (see Table 2) between the VR breakout (Mean = 4.6, SD = 0.74551, SE = 0.35185) and the AR breakout (Mean = 4.3, SD = 1.57221, SE = 0.34376). It is worth noting that five consumers preferred the AI and AR application, two users preferred the VR breakout, while three users noticed no differences.

Table 1. Result analysis of efficiency VR vs. AR breakout

Mobile Game	Mean	Standard Deviation	Standard Error
AR Breakout	4.7	2.45565	0.58364
VR Breakout	6.4	0.99302	0.51371

Figure 3. Analysis of usefulness of VR vs. AR breakout

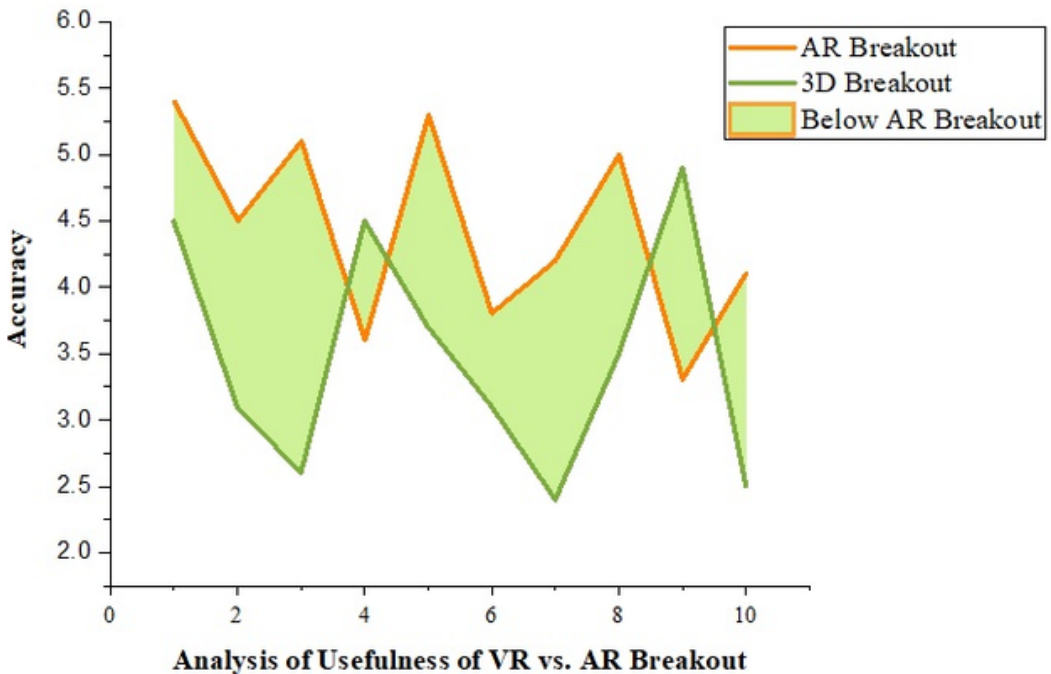
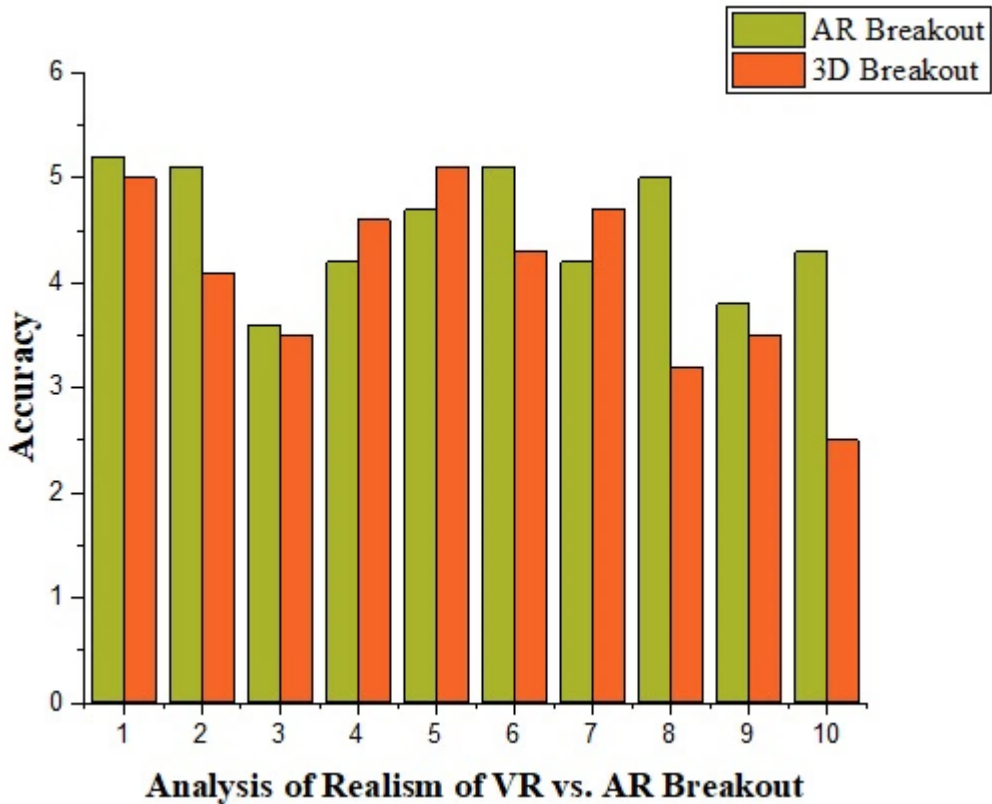


Table 2. Result analysis of usefulness of VR vs. AR breakout

Mobile Game	Mean	Standard Deviation	Standard Error
AR Breakout	5.3	1.67221	0.44373
VR Breakout	5.6	0.84551	0.45184

Figure 4. Analysis of realism of VR vs. AR breakout



Higher accuracy of  $0.04^\circ$  was achieved in VR, which is not very different from AR. Also, for both conditions, the center of the field of view (FOV) showed the best accuracy. Because space is limited, there is a system that keeps users away from the real room's walls. It also makes it easier to move in a straight line within the atmosphere. Users can also use tricks like teleportation with the help of AI to avoid hitting boundaries that might take them out of the VR experience. In fact, feature  $F_n^i(\Theta_n)$  indicates that bidders' dependence is not simply on the budget, but that the  $4(\beta_n^i)^2 \Theta_n$  amount determined to offer may change in the next stage related to variation in duties. Finally, by simplifying  $(D_0 - \alpha_n^i - C_j^i \Theta_n)$  the preceding equation, then performing derivation, they will also have  $A_{ij} = A_{ij} \sqrt{\frac{\theta_n^{-i}}{\theta_j^{-i}}}$ , based on to retrieve in Figure 4. In this regard, the visual degree of realism was determined, as illustrated in Figure 4. Despite the fact that both techniques employed the same graphic

design engine, many consumers preferred the traditional method of presenting graphics inside the case. The VR breakout obtained a somewhat higher score (Mean = 4.2, SD = 0.85625, SE = 0.47215) than the AR breakout (Mean = 3.6, SD = 0.936142, SE = 0.14785). The main reason being that the AR breakout app with AI automation blends a computer animation scenario (see Table 3) with a sequence of photos shot by a reduced webcam (740484, 1.5 MP). The merging method significantly affects the realism of visuals displayed in an AR scene; however, if a high-resolution picture is being used, the reality is recovered.

By replacing  $C_j^i$  in (3) using  $\Theta_n - e_{in}$ , the feature  $g_n^i(\Theta_n)$  is produced, which constructs the  $2(A_0 - \gamma_n^i)^2$  offer regarding the time limitation based on the to retrieve in Figure 5, which depicts the results of a fourth quantification, which compares respondents' ability to study how else to play the breakout performance. Although neither system is considered an instructional game, users can learn a different set of skills about how to play the game. Amazingly, most regular contributions of AI claim the AR breakout (Mean = 4.7, SD = 0.73548, SE = 0.35678) is much easier to adjust to and improve upon than the VR breakout (Mean = 4.1, SD = 0.953372, SE = 0.256347). This is worth noting that a latest survey of surgery prescribers revealed they have stronger reactions after 30 minutes of playing a cultural communication in tourist attractions game (see Table 4).

Table 3. Result Analysis of Realism of VR vs AR Breakout

Mobile Game	Mean	Standard Deviation	Standard Error
AR Breakout	4.6	0.986142	0.24784
VR Breakout	5.2	0.916252	0.57219

Figure 5. Performance learning analysis of VR vs. AR breakout

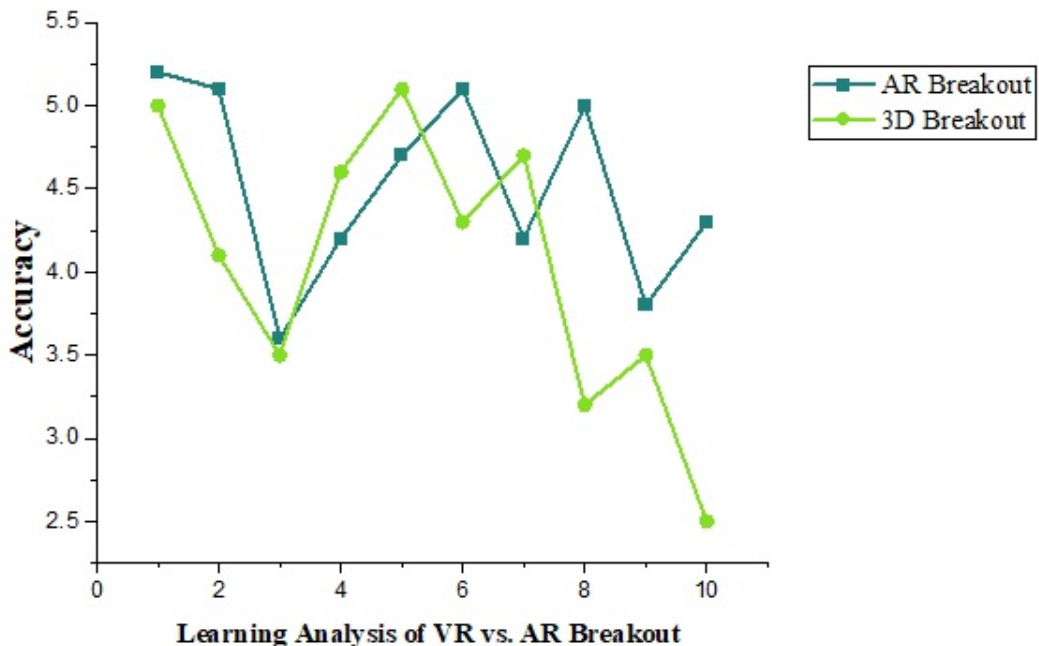
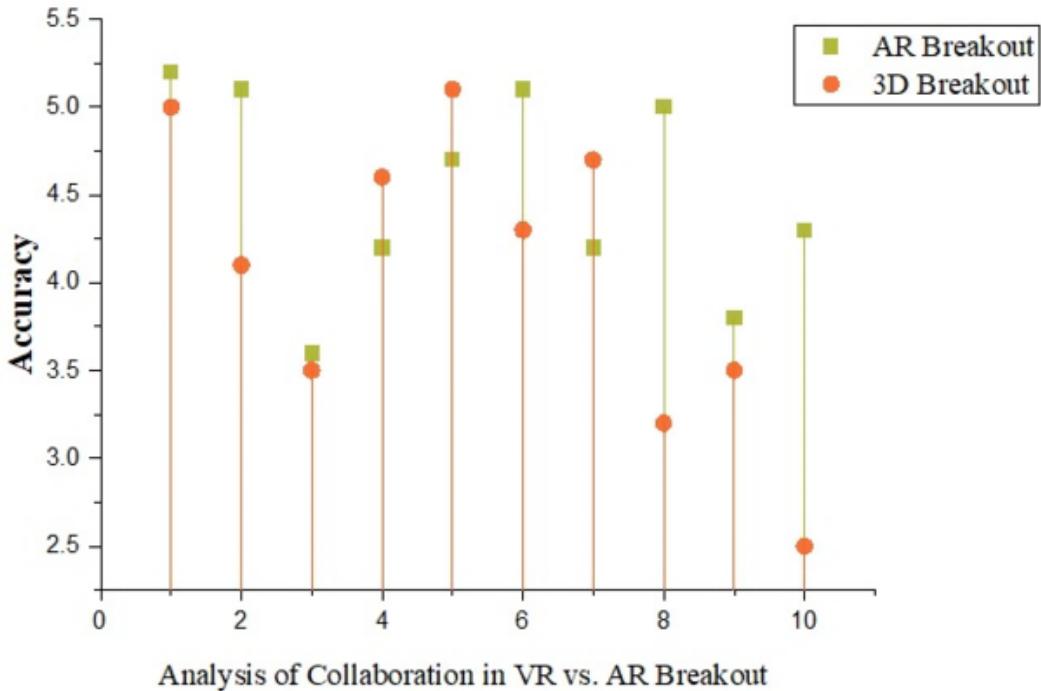


Table 4. Learning result analysis of VR vs. AR breakout

Mobile Game	Mean	Standard Deviation	Standard Error
AR Breakout	5.7	0.835484	0.556785
VR Breakout	5.1	0.993372	0.456342

Figure 6. Performance analysis of collaboration in VR vs. AR breakout



The  $\frac{\rho_e}{\rho_e + \rho_r}$  first section of the questionnaire comprised multifunctional questions aimed at

evaluating users' attitudes about  $\frac{N_j^i \theta_j^{-1}}{\sum F_j^i A_j^2}$  various types of games, such as traditional and cultural

communications in major tourist games. It is  $\theta_e^i N_j^i - \theta_e^i N_j^i$  important to note that there is a whole generation of children that grew up with AI technology, and consequently, they are expected to be more supportive to retrieve in Figure 6.

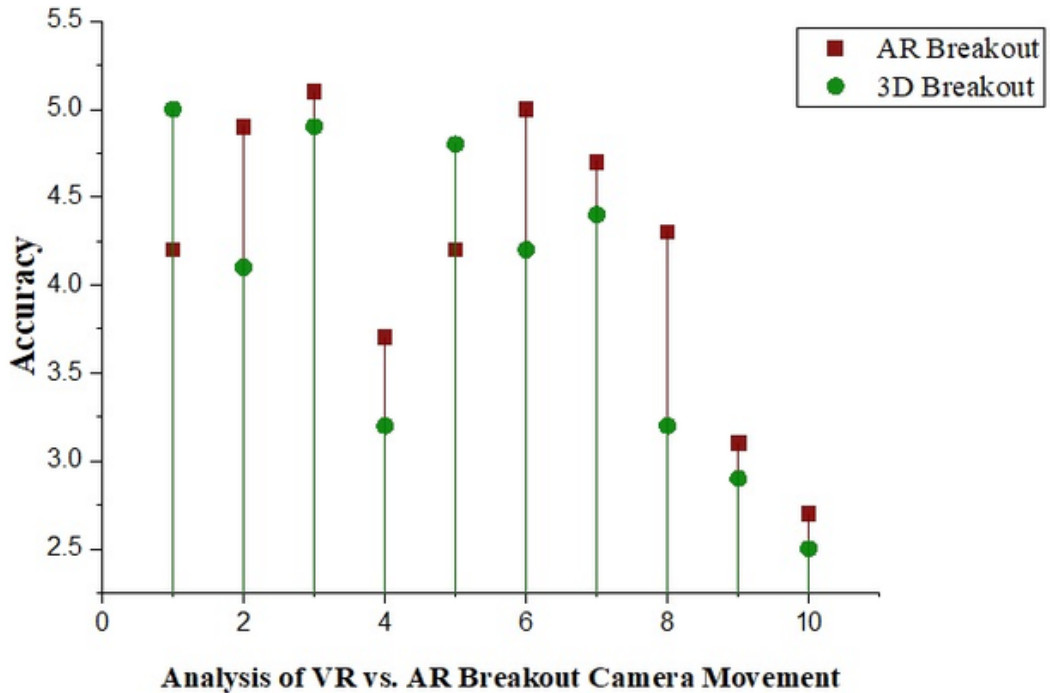
Furthermore, as illustrated in Figure 6, collaborative and interactive strategies in both VR and AR gaming were explored. Again, the AR breakout (Mean = 4.2, SD = 1.0328, SE = 0.3266) scored considerably higher (refer to Table 5) than the VR breakout (Mean = 3.1, SD = 1.59513, SE = 0.50442). The most obvious answer is that the AR breakout enables physical manipulations by mixing regular I/O devices like the touchpad and access points like permanent marker cards. In contrast, communication within the VR breakout is limited to normal I/O interactions.

It  $N_j^i \theta_j^{-i}$  is unmistakable that 80% prefer to play computer games, while 70% prefer to play culture and communication games at tourist attractions. Surprisingly,  $\rho_e + \rho_r$  just 54% of people

Table 5. Result analysis of collaboration in VR vs. AR breakout

Mobile Game	Mean	Standard Deviation	Standard Error
AR Breakout	5.2	2.0328	0.42664
VR Breakout	4.1	2.59513	0.60443

Figure 7. Performance analysis VR vs. AR breakout camera movement

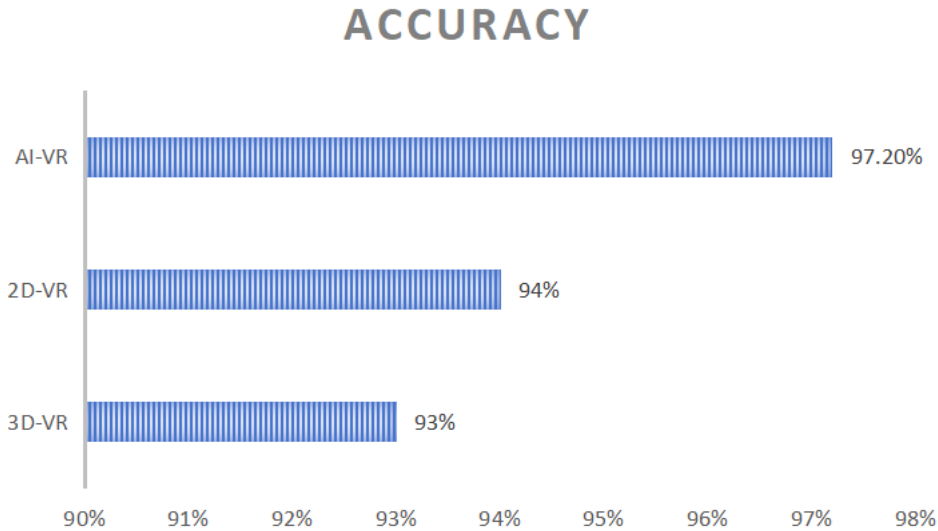


regularly play traditional games, whereas 62% choose cultural communication through tourist attractions games. This is an  $\sum F_j^i A_{ij}^2$  intriguing statement, since, having lived in a culture where communication process in tourist hotspots games arise, consumers continue to retrieve in Figure 7. Finally, it has been somewhat analyzed by reviewing the outcomes, which are displayed in Figure 7. By employing pre-defined shortcut keys, the camera inside the VR breakout could be adjusted and positioned anywhere in the AI and digital environment. AR breakout users, on the other hand, must move the web camera directly inside the real environment and AI environment. Because most users are used to manipulating a normal web-camera, the camera manipulation methods (see Table 6) in VR breakout (Mean = 4.8, SD = 2.68754, SE = 0.39873) are considerably more user-friendly than in AR breakout (Mean = 3.9, SD = 1.65073, SE = 0.39638).

Table 6. Result Analysis VR vs. AR breakout camera movement

Mobile Game	Mean	Standard Deviation	Standard Error
AR Breakout	4.9	2.65075	0.49632
VR Breakout	5.8	3.68759	0.49876

Figure 8. State of art in comparison of accuracy with existing methodologies



As the VR technology incorporates many techniques, the AI-based VR offers a high accuracy of 97%. By using the supervised learning algorithm, the performance and accuracy rate is comparatively higher than the existing methodologies like 2D-VR and 3D-VR (see Figure 8).

## CONCLUSION

Through the use of VR, tourists and locals alike can take a virtual tour of a city or tourist destination from every angle. The video is exhibited from a fixed point of view in ordinary videos. VR uses specialized cameras, camera rigs, and software to capture a whole scene in 360 degrees. While VR content is best viewed through headsets, it may also be viewed on laptops, desktop computers, and smartphones. Visitors can select attractions and view details with the help of VR photography. The attraction can be viewed in 360 degrees before visiting that particular attraction in person. Similarly, VR video viewing provides clear information about the tourist attraction, so tourists can catch certain important details. Studying the role of VR technology in cultural communication in tourist attractions with the help of AI technology is the focus of this investigation. In order to convey a specific message to the society, cultural communication is defined as the use of different modes of communication such as verbal, non-verbal, and symbolic communication methods. Tourists can appreciate the history and culture of a tourist attraction through VR pictures and films of the place. The study results prove AI-based VR has generated a mean for VR breakout as 5.8, which indicates VR breakout outperforms well in analyzing the tourist attraction.

## DATA AVAILABILITY

The figures and tables used to support the findings of this study are included in the article. The data analyzed during the current research period can be obtained from the communication author according to reasonable requirements.



## **CONFLICTS OF INTEREST**

The authors declare that they have no conflicts of interest.

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## **AUTHOR'S CONTRIBUTION**

N.H. contributed to Conceptualization, Data Curation, Formal Analysis, Methodology, Resources, Software, Validation, Visualization, Writing, editing and final submission.

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