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Bridging reality and the reel: An AR-enhanced application model for memorable tourist experiences

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Abstract: Over the past decade, the convergence of technology and entertainment has opened new avenues for improving the experiences of film enthusiasts and tourists alike. Focusing on merging reality and reel to enhance memorable tourist experiences, this paper introduces a comprehensive design model for developing smart film tourism applications. A qualitative approach was employed to explore the expectations and potential issues faced by film tourists throughout their journeys. Subsequently, insights are generated and translated into four key design aspects and corresponding features, integrating augmented reality technology. The convergence of elements within the model aims to facilitate a deeper connection between tourists and film-based destinations, fostering increased interactivity and immersion. Furthermore, a utility test was conducted on a prototype application, and the positive results validate the model's potential for designing memorable film tourism experiences, offering a reference path for experience design in the tourism industry.

Keywords: Film tourism, experience design, application design, AR technology

1. Introduction

Film tourism is a growing phenomenon in which people are motivated to visit certain locations featured in films or television shows (Beeton, 2006). The impact of successful films on filming locations is evident both culturally and economically (Gkritzali et al., 2016; Li et al., 2017), and several regions have recognised the potential of film tourism as part of their government strategies (Kim & Reijnders, 2018). In the context of Hong Kong, its well-developed cinema industry and fame as a global tourism destination have provided numerous attractive film locations, particularly for Asian fandoms. The Hong Kong government has also recognised this potential and has partnered with cultural industries to promote tourism (Hong Kong Tourism Board, 2023).

As an experience-based industry, tourism can gain a competitive edge by providing exceptional experiences to tourists (Matošević Radić et al., 2021). A higher level of

involvement can create a more memorable and enjoyable impact on tourists' travel experiences (Sugathan & Ranjan, 2019). The factors related to the on-site experiences of film tourists include the relevance of film backdrops, authenticity, visual appeals and tourists' sense of interaction (Kim et al., 2019; Buchmann, 2010). Furthermore, engagement and involvement are key aspects contributing to tourists' experiences and associated behaviours (Chen & Rahman, 2018; Teng, 2021). Despite the importance of these factors, the varied perspectives of film tourists and the differing contexts of film locations make it challenging to propose implications for enhancing film tourism experiences.

As smart tourism evolves, it has brought innovative technologies aimed at enhancing people's travel and entertainment experiences. One of the most significant technologies is augmented reality (AR), which has superimposed a virtual scene over a real scene to effectively enhance tourists' experiences (Fan et al., 2022). Therefore, considering the alignment between AR's advantages in on-site interaction and the requirements of cultural tourism (Yung & Khoo-Lattimore, 2019), with the emerging phenomenon of utilising AR-enhanced applications in tourism (Saragih & Suyoto, 2020), this paper aims to propose a model as a guideline for designers in developing AR film tourism apps to enhance immersive experiences for tourists. Specifically, we explored the following research questions:

RQ1: What are tourists' expectations for film tourism, and what factors influence their experiences during visits to film locations?

RQ2: How can AR-enhanced applications be designed to meet these expectations that fulfil tourists' experiences?

To address the inquiries above, we conducted a qualitative study in Hong Kong, an Asian city renowned for its abundant film resources and popularity among tourists. This article identifies connections between expectations and issues during film tourists' journeys and proposes a design model that has practical implications for designers to create immersive film tourist experiences in real-world entertainment practices. The rest of the paper is organised as follows: Section 2 discusses the literature on concepts of film tourism, tourist experiences and the integration of AR's abilities into facilitating tourists' experiences. Section 3 outlines the scope of our research and presents the step-by-step approach employed. Section 4 presents the findings encompassing tourists' expectations, challenges and design opportunities, as well as illustrates our proposed model for designing AR-enhanced film tour apps. In Section 5, we elaborate on how the identified design aspects and features of the proposed model enhance tourist experiences. Finally, conclusions and future work are presented in the last section.

2. Literature review

This section provides review of previous studies on 'film tourism', 'film tourists' experiences' and relevant experience theories. Furthermore, the potential of AR for integration into film tourism is examined.

2.1 Film tourism and film tourists

The phenomenon of film tourism can be traced to literary tourism, where individuals travel to locations mentioned in books. The emergence of Hollywood films in the 1920s marked the beginning of the trend of film tourism (Kim & Reijnders, 2018). *Film tourism* is typically defined as trips induced by movies or TV shows, including visits to film locations, film production studios and theme parks (Beeton, 2006).

Film tourists refer to tourists who travel with intentions triggered by films. Macionis (2004) described *specific film tourists* as those who actively seek film locations due to their interests and knowledge of the associated films. The range of potential sites for film tourism is broad, including portrayed locations (real/substitute), film festivals, film studios, celebrity spotting locations, film theme parks, award ceremonies and places marketed through film locations (Rittichainuwat & Rattanaphinanchai, 2015). Generally possessing a deeper understanding of films' contents and more emotional investment, film tourists hold higher expectations when visiting film locations (Connell, 2012).

Many locations that have gained recognition as film and television settings have significantly boosted local tourism economies. The impact of films on regional tourism is particularly evident in cases such as *The Lord of the Rings*, *Game of Thrones*, and *Harry Potter,* which have successfully attracted tourists and generated foreign currency revenues for shooting locations (namely, New Zealand, Croatia and the UK; Contu & Pau, 2022; Kim & Reijnders, 2018; Reichenberger, 2021). Hong Kong has been a major supplier of Chinese films since the 1970s, producing up to 150 movies a year at its peak in the 1990s (Heaver, 2019). The city's distinctive urban and street landscapes are frequently used as settings and backdrops for storylines (Kim et al., 2019). Given its well-established film industry and rich cultural heritage, Hong Kong holds immense potential in the Asian region for attracting global tourists seeking the quintessential 'Hong Kong flavour' depicted in films (Kang, 2019). Therefore, this research considers the Hong Kong region as a sample location to explore the application of new technologies in innovating upon the nostalgic style of film tourism.

2.2 Film tourism as an experience

Experience, a continuous stream of thoughts and emotions that arises during states of awareness, is a personalised event that happens internally within an individual (Barrett et al., 2007). Both subfields of the experience economy, film tourism differs from regular tourism in that it elicits tourists' associations between specific film scenes and on-site scenarios, encompassing personal interpretations of media images and collective memories among like-minded tourists (Berić et al., 2013; Kim et al., 2019). The alignment of media memories with tangible locations enables film tourists to experience a unique feeling of imagination, interpretation and memory (Kim, 2012). As noted by Jantzen (2013), *experience* stems from individuals' interactions with their surroundings. These surroundings encompass the physical setting, social actors and any social interactions with other customers and service facilitators (Zomerdijk & Voss, 2010), which are also applicable to enhancing film tourist experiences.

Existing research primarily focuses on factors that influence tourists' subjective feelings, such as visit motivations and the degree of engagement, that impact tourist experiences. On one hand, visit motivations arise from potential tourists' destination awareness gained from watching audio-visual works (Araújo Vila et al., 2021), which spark the imagination and emotion related to locations, storylines and celebrity icons (Rahman et al., 2019). These motivations drive tourists' desire to compare mental images and icons from watching films with actual locations, thereby creating a visit motivation (Araújo Vila et al., 2021).

On the other hand, the degree of engagement for film tourists is a critical factor that significantly influences their experiences and behaviours (Teng, 2021). It encompasses emotional connection, attachment and loyalty to a specific tourism destination (Chen & Rahman, 2018). Strengthening tourists' engagement and their psychological connection with film locations is crucial for enhancing their behavioural intentions and overall experience (Teng, 2021). Interaction forms, such as reciting lines, mimicking characters, handling props and recalling scenes, have been employed to fulfil the hyper-realistic expectations of film tourists (Kim et al., 2019). Nonetheless, limited research has systematically explored the barriers that hinder tourist engagement throughout the film journey. Furthermore, Williams et al. (2017) identified drivers of tourist value, including functional, socioemotional and novelty values, which have been applied to evaluate tourist satisfaction and engagement.

2.3 AR technology for film tourism

Augmented reality (AR) is a technology that modifies the perception of real-world images by overlaying digital information on them (Dargan et al., 2023). This technology enhances the natural environment by overlaying virtual computer-generated information in real time, directly or indirectly, allowing virtual elements such as cartoons, videos, images and text to be added to the real world (Dargan et al., 2023). Having developed for two decades, it is not a new technology and has become readily available, now extensively utilised across various industries (Arena et al., 2022).

In the last few years, the tourism industry has shown growing interest in AR. Tourism research indicates that, compared to similar technologies such as virtual reality (VR), AR applications have greater advantages in enhancing tourist experiences (Yung & Khoo-Lattimore, 2019). Examples of AR applications in tourism include using AR as an information dissemination tool (Hammady et al., 2020), as a location guide (Cheah & Baker, 2020) and as an interactive authoring tool (Fenu & Pittarello, 2018). AR applications are commonly used in museums, heritage sites and theme parks (Wu & Lai, 2021). While large immersive devices can be deployed in these locations, mobile AR apps offer a more practical option for film tourism, which often involves broader and more dispersed physical sites (Yung & Khoo-Lattimore, 2019). Additionally, AR can effectively integrate real and virtual imagery, allowing tourists to immerse themselves in the film's context while exploring the actual film locations, fulfilling the desire for hyper-reality experiences (Teng, 2021) and avoiding the disparity between the physical location and the depicted film scenes (Buchmann, 2010). Therefore,

AR technology has emerged as a promising tool for addressing these challenges in film tourism.

While research has focused on the technical functions of AR technology and various AR solutions, there is a lack of guidance on how to design AR features to enhance film tourists' negative experiences. This will be explored in the following sections.

3. Methodology

The research method was designed to gather comprehensive qualitative data. This approach was grounded in an iterative process of data collection and analysis, yielding meaningful insights into the film tourism experience. The process comprised four phases: interviews, in-situ observations, model development and user testing, as illustrated in Figure 1.

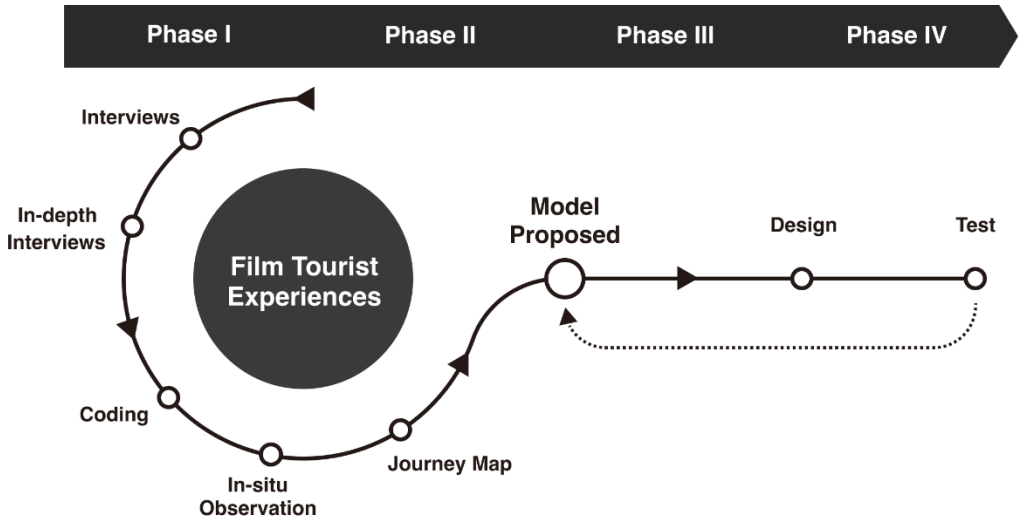

Figure 1 The design phases and methods.

3.1 Phase I: Explore and define users' needs and challenges

The initial phase involved conducting semi-structured interviews with potential users employing a purposive sampling strategy. Twenty participants were selected from film locations, and they were from diverse backgrounds, including residents and visitors from other regions who had previously visited renowned film locations in Hong Kong (see Appendix A for full participant information). According to Macionis's (2004) three types of film tourists, the participants in this study can be classified as either 'specific film tourists' or 'general film tourists', as they possess a certain level of interest in watching Hong Kong films and the relevant film tours. This approach allowed an open-ended exploration of respondents' experiences, expectations and challenges throughout their film journeys in Hong Kong. It was essential to understand the context in which potential users would engage with the proposed app, their motivations for using such a service and the potential barriers to its adoption. The findings from these interviews helped grasp an overall understanding of tourists' expectations and issues, ensuring that future app design features are rooted in users' needs and preferences.

3.2. Phase II: Observe and identify contextual factors

Following the interviews, in situ participant observations were conducted at various film tourism locations. Ten film locations in Yau Ma Tei[1] and Sham Shui Po[2] were selected based on their cinematic prominence (see Appendix B). This method involves observing users in their natural environments. Factors observed ranged from the sites' physical settings to the cultural atmosphere, including site layout, architecture, lighting, composition and framing, the flow of people, historical or cultural significance etc. Moreover, tourists' behaviours within the environment and their interactions with fellow travellers and other stakeholders at the scene were particularly concerning. These observations were crucial for identifying the contextual factors, thereby finding the potential way for AR to match the context and facilitating users' interaction with the environment.

3.3 Phase III: Synthesis and development of the design model

Following the preliminary interviews and in-situ observations, Phase III involved synthesising the collected data and developing the design model underpinned by grounded theory (Friese et al., 2018).

The collected interview data were analysed using ATLAS.ti, qualitative data analysis software. Through thematic analysis (Jason & Glenwick, 2016), the interview content was coded to extract key concepts and generate design themes. This process facilitated the identification and categorisation of film tourists' expectations as well as the identification of challenges that could hinder a memorable and seamless experience. To further illustrate users' experiences at film locations and the challenges they could encounter at diverse stages, we developed a user journey map, which allowed us to visualise key touchpoints and pain points throughout the film tourism journey. This helped us find opportunities for the intervention of AR app features to enhance users' behaviours from the design aspects that we gained from previous insights. Through the connections between the gathered findings, we crafted a proposed model for designing an AR-enhanced film tourism app.

3.4 Phase IV: Evaluate and reflect on the model

The final phase involved the user testing of an app prototype developed based on the design model. By testing the app's usability and functionality and collecting feedback on its design features, we aimed to validate the design model and gain insights into possible improvements or modifications.

The test process included presenting prototypes to participants and allowing them to interact with app features at the specific film location – Audio Space[3]. Three groups of subjects, comprising three, three and two people, respectively, were assigned to use the main functions of the prototyped AR app. They were also asked to compare their

[1] Yau Ma Tei is an area in Kowloon District where many Hong Kong police dramas have been filmed.
[2] Shan Shui Po is an area in Kowloon District, with filming locations in some international films such as *Transformers 4: Age of Extinction*, *The Grandmaster*, *Infernal Affairs* and *Ghost in the Shell*.
[3] Audio Space is a tube electronic shop known as the filming spot of the famous Hong Kong movie *Infernal Affairs*.

experiences with and without the app. The data from participants' feedback, opinions and observations were documented for final reflection. This iterative process of synthesis and development provided a holistic understanding of film tourist experiences. It helped identify both the explicit and implicit needs of film tourists, address design issues and ensure alignment with prioritised functionality, usability and user engagement.

4. Findings

The research findings unveiled a complex interplay of user expectations, design challenges and user engagement levels. Based on these insights, a model for designing AR-enhanced applications was proposed. These findings are structured in the following section.

4.1 Film tourists' expectations

Through the process of coding diverse data collected from interviews, three expectations were derived from film tourists' experiences (see Table 1). Their exact explanations are summarised below.

1. **Embodiment Experience**: A desire for immersion in the emotions and concepts depicted in the film within an authentic setting.
2. **Expression of Ideas**: An aspiration to express their personal ideas and perspectives within the context of film tourism.
3. **Memory Recording**: A wish to document and capture the unique moments and memories of their film tourism experience.

Table 1 Film tourists' expectations throughout the coding process.

Data sample	Category	Expectation	Description
'I like feeling being on the site of the story. It makes me excited'. 'In the anime, the place is described as heaven. But when I visited, it had been commercialised with all kinds of projects for money'. 'I want to feel as characters do, not just visit the place'.	1. Tourists want to visit the same locations of the film scenes. 2. Tourists want the tour to be as consistent as possible with the film scene. 3. Tourists want to experience the feelings and emotions of film characters on-site.	**Embodiment Experience**	The thoughts and emotions expressed in the film can be felt accurately in the physical reality of the scene to gain a more immersive experience.
'I like to imitate the clothes of the characters in the movies'. 'When being on-site, I often imagine the story of what happened in the movie; there will be a kind of personal romance'.	1. Tourists want to imitate and re-enact some classic movie plots. 2. Tourists want to have space for their imagination about the film.	**Expression of Ideas**	Create new stories through tourists' imagination.

'I am used to recording vlogs during travel, it can help me look back on these happy times'. 'I want to post my photo on the net to share with my friends'.	1. Tourists like recording their tourism as a memory preservation of good times. 2. Tourists like recording their tourism as a memory to share with others.	**Memory Recording**	Permanently preserve real-life experiences through media records, such as diaries, videos, and souvenirs.

4.2 Challenges and opportunities

After categorising the recorded issues, the analysis identified a set of design issues, highlighting key pain points that participants may have encountered during their on-site journey (see Table 2). For instance, some film tourists imagined themselves as film characters and sought story adaptations to fulfil their desire for personalised experiences. Some wanted to break the limits of the screen and experience the film in the real world, engaging multiple senses, such as touch and smell. To validate their movie travel experiences, they often relied on media records to capture and share their feelings.

Table 2 Findings of issues and design aspects from the coding process.

Issue	Design Aspect	Description
1. Tourists cannot find the right locations and special locations of the film scenes. 2. Tourists need more iconic tourism routes for particular films.	**Film Route Guidance**	Managing and navigating film-related routes assists tourists in exploring locations, offering customised services for engagement.
1. The environment and architectural atmosphere are different from what is presented in the film. 2. Tourists feel that the environment is not immersive enough, and it is easy to be disturbed by the outside world.	**Environment Coherence**	The restoration of physical film locations can enhance the authenticity and accuracy of the film scene, thereby improving the overall quality and realism of film tourism.
1. There are not enough elements (e.g. props, sets, costumes, memorabilia) associated with films on sites. 2. Tourists cannot have the same experiences and feelings as those in the plots of films.	**Film Elements' Integration**	The missing elements associated with the film make the film tourists feel disconnected from the film and the locations they are visiting, which can lead to a less engaging and memorable experience.
1. Tourists do not feel engaged due to the lack of sensory and playful activities. 2. Tourists want to wear costumes and re-enact plots with their friends. 3. It is a bit hard for tourists to record and share their unique tourism memories.	**On-site Interaction**	Some memorable interactions related to the film are needed on film sites. In addition, film tourists' ideas need an outlet to be expressed on site.

The challenges identified by users can be transformed into opportunities for design improvements. We employed the user journey map to analyse the tourists' perspective (see Figure 2). By summarising the information from the interviews and observations, the challenges and opportunities at each stage were demonstrated.

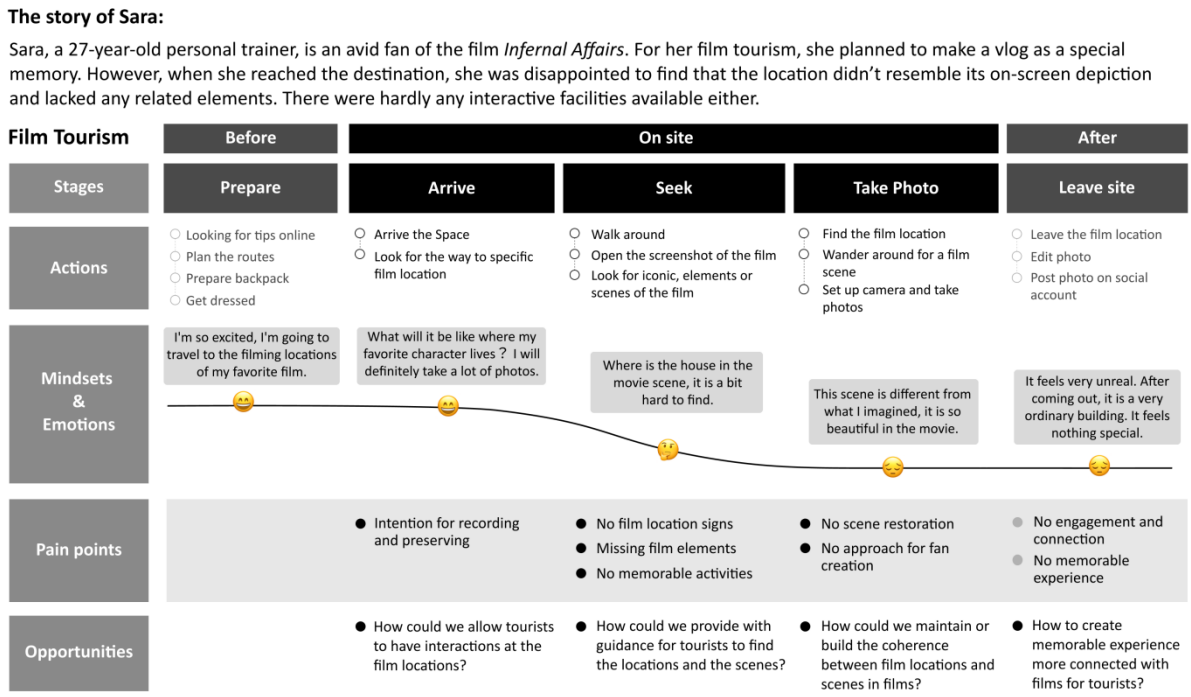

Figure 2 Sample of user journey map for film tourists' experiences.

4.3 Conceptual design model

To address the challenges of meeting users' expectations, we interpreted coding-derived design challenges as actionable design aspects. This led to the creation of the design model illustrated in Figure 3, which guides the development of an app that addresses prevalent challenges in film tourism. Film tourists commonly aim to engage with film locations, express their feelings related to films and preserve their activities and emotions as memories. Meanwhile, feedback from film visitors highlighted the relationship between issues and their impact on tourist experiences and their expectations. For instance, the scarcity of scene restoration at film locations disrupts the embodiment experience, creating a gap between reality and film tourists' expectations. The series of challenges such as 'No environment coherence' drives the design aspect 'Environment Coherence', which aims to bridge this gap by including app features.

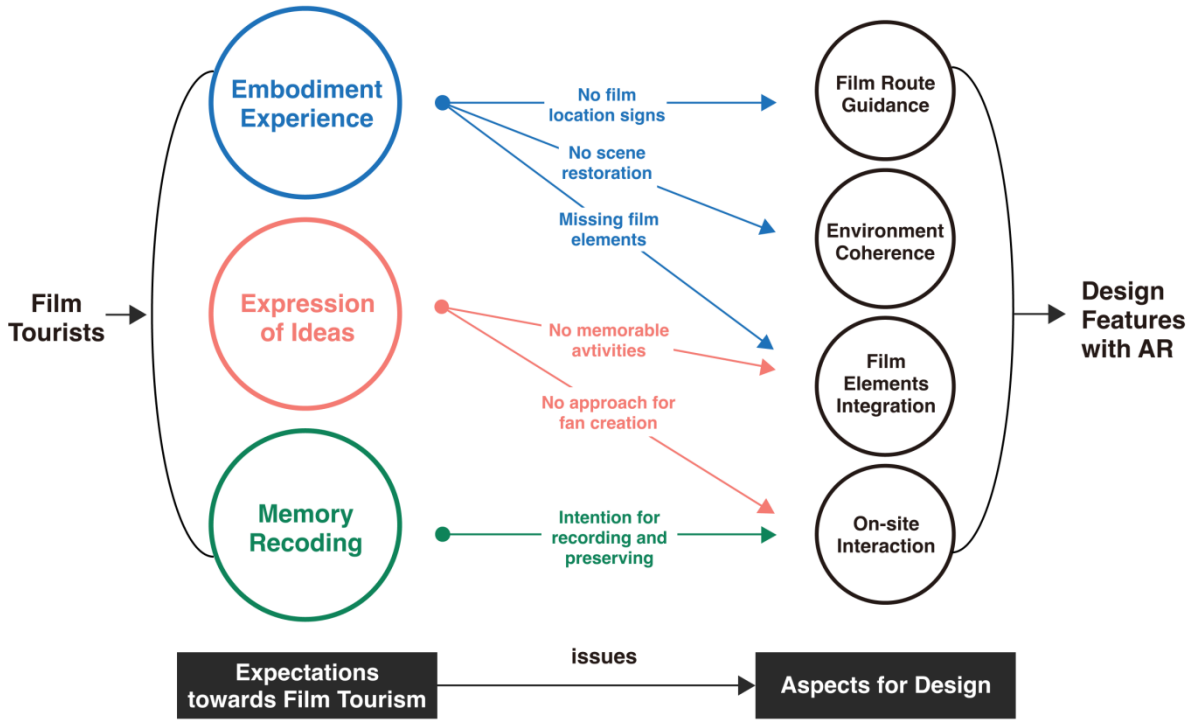

Figure 3 A model for designing apps to improve film tourists' experiences.

Overall, the four design aspects, including 'Film Route Guidance' (personalised route management), 'Environment Coherence' (enhanced authenticity of film scenes), 'Film Elements' Integration' (integration of film elements to engage memorable experiences) and 'On-site Interaction' (expression of ideas and activities on-site), led to implications for designing the app.

4.4 Test and evaluate

The design model was validated through a usability test that evaluated a prototype application developed based on the proposed model. Key features such as 'AR Route & Navigation', 'Creation Space' and 'Record & Online Community' were assessed. These features aid users in navigating film locations, expressing their creativity with 'Film-based Virtual Elements' and sharing their experiences online, respectively. The model was further evaluated through a utility test involving participants with diverse backgrounds (see Figure 4). They assessed the efficiency of the application design and provided feedback on its significance to their experience.

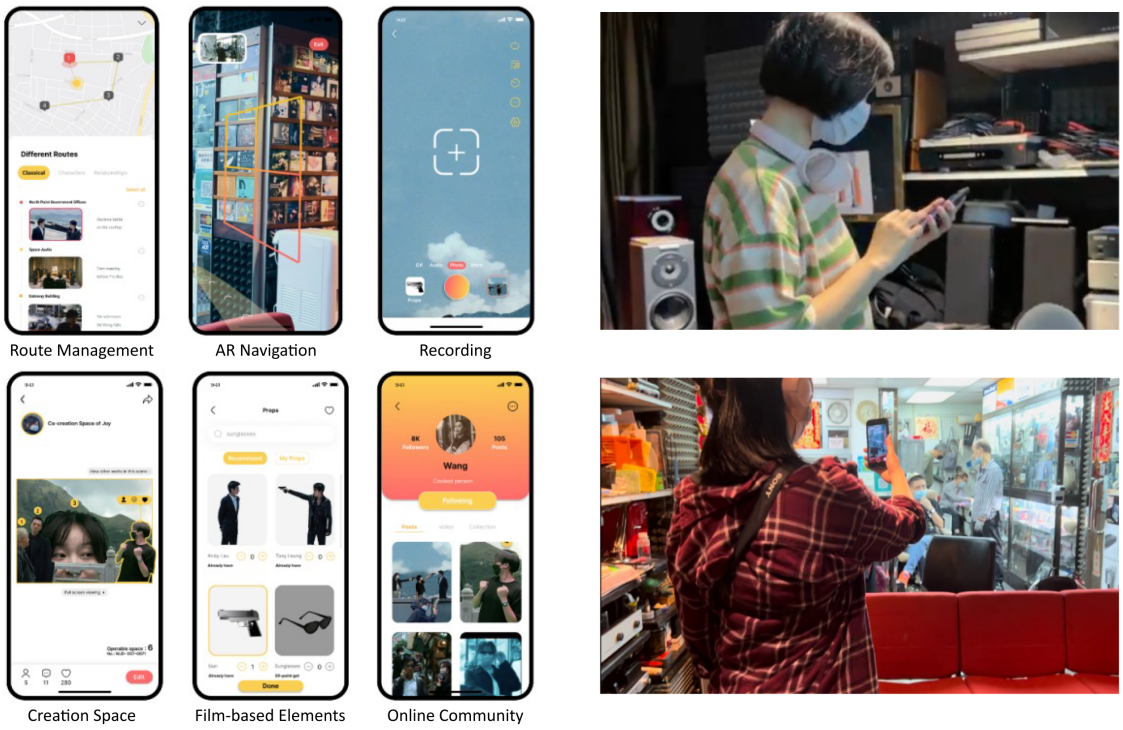

Figure 4 Application's main interfaces and the utility test in settings of the film Infernal Affairs*.*

The test evaluated tourist satisfaction based on four dimensions (Williams et al., 2017): functional, social, emotional and novelty values. *Functional value* refers to the utilitarian worth of a product compared to alternatives. The remaining three values were derived from socio-psychological dimensions. *Social value* reflects social group opinions, *emotional value* assesses evoked feelings, and *novelty value* measures curiosity, satisfaction and knowledge acquisition. As illustrated in Table 3, most participants expressed positive views regarding the values provided by the design artefact.

Table 3 Summary of participants' feedback on the proposed design artefact.

Functional Value	**Social Value**
1. This application provides guidance, which makes the whole journey less troublesome, especially when looking for those scenes. 2. Templates for creation are very attractive, and I can quickly show my ideas.	1. The fan creation of the film is very interesting, and the distance between the film tourists can be reduced through this online platform. 2. It enables people to play with friends both online and offline, which I believe is more fun.
Emotional Value	**Novelty Value**
1. It is pleasant to communicate with people sharing similar interests, and I could express some ideas about specific films. 2. I can compare the film and the video I took, feeling a sense of achievement.	1. Using this application and interacting with a place in the virtual world are better when taking exploration as a purpose. 2. It could add a bit more fun when travelling, as many tourism places are quite boring.

The feedback affirmed the positive impact of the design model on addressing the identified issues and demonstrated the effectiveness of AR technology in this context.

5. Discussion

The preceding sections have detailed the specific features we have proposed for an AR-enhanced smart application, elucidating their potential for improving the user experience based on feedback from participants (see Figure 5). We discuss how these identified design aspects and features enhance the user experience and highlight the contribution of our design to a broader scope of studies in the context of film tourism. As we synthesise the findings, the following section also discusses potential areas for future research and considers the implications of study outputs.

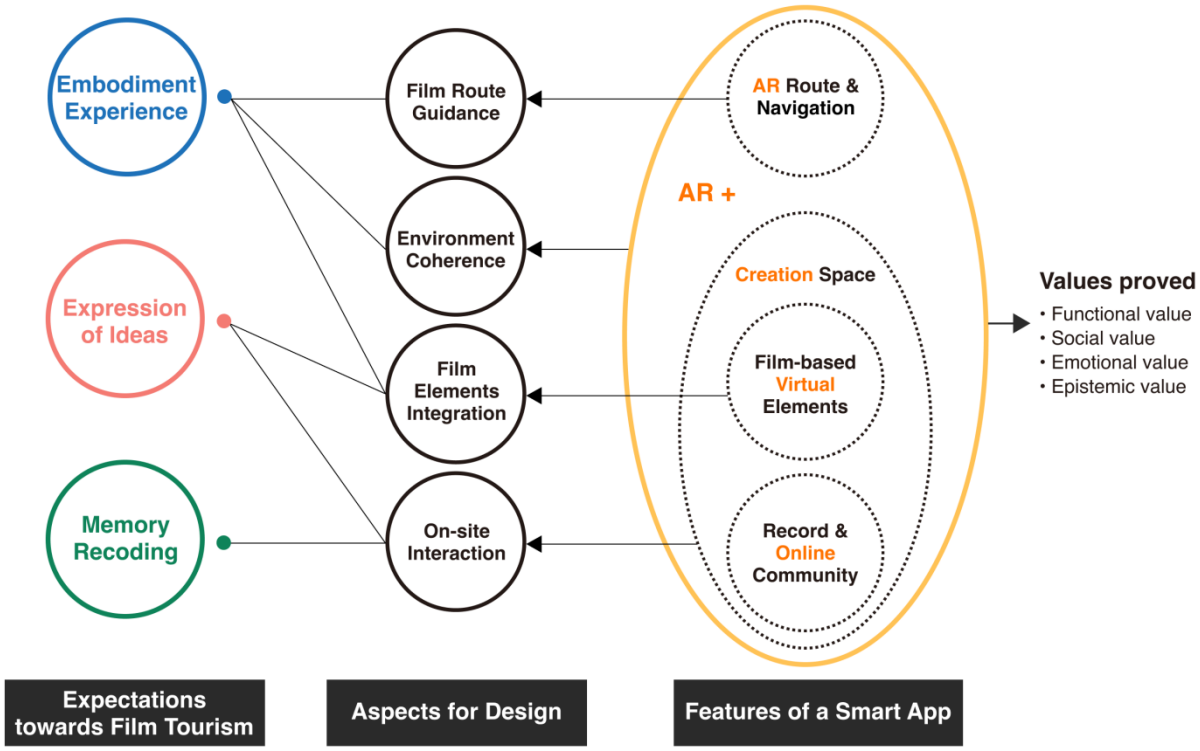

Figure 5 Illustration of how design aspects and features enhance the user experience.

5.1 Engaging through customised routes and AR navigation

The 'AR Route & Navigation' feature in this application allows users to navigate meticulously designed paths that intersect various film locations from a multitude of films. By offering customised routes, this feature significantly increases the overlap between tourists' journeys and film scenes, thereby effectively improving tourists' on-site engagement (Kim et al., 2010). This approach addresses the challenges associated with locating film sites, alleviating difficulties in finding the exact film destination and providing convenient routes. In addition to route customisation, the feature optimises users' navigation to the set place through seamless AR indicators onscreen. Compared to conventional app designs featuring maps with image markers, the integration of AR engenders real-time interactivity (Neuhofer et al.,

2014). This dynamic allows users to visualise in real time the symbiotic relationship between their immediate surroundings and the cinematic representations in their minds.

From a functional perspective, this design within the model addresses the user's need to locate film-related destinations effectively. Simultaneously, it achieves novelty value by enhancing users' understanding of these destinations when on site, fulfilling their desire for increased engagement and immersion in real-world settings.

5.2 Expressing through personalised creation with virtual film elements

Traditional film tourism often centred on the direct imitation of original film scenes, resulting in a proliferation of identical check-in photos on social media and the void of unique travel memories (Frost, 2010). The 'Creation Space' feature in the application challenges this norm by enabling users to express their creativity through personalised videos and photo creation. This feature allows users to incorporate 'Film-based Virtual Elements' within their content using templates grounded in AR scenarios built from reality. These elements can range from the characters' traditional attire to props used in films and can even incorporate tourists' selfies, creating an innovative blend of real and virtual environments (Yovcheva et al., 2013). Such an approach empowers users to craft a bespoke film check-in experience that authentically mirrors their emotions and thoughts at the moment. This personal creation not only immerses tourists in the cinematic world, but also transcends the boundaries of reality (Xu et al., 2015). This creative perspective, embodied in the 'Creation Space' feature, caters to users' emotional value, presenting a novel experience that diverges from the standardised and predictable pattern of conventional travel experiences. In this way, the 'Creation Space' feature fosters a more personal and immersive form of film tourism, which not only enriches users' experiences but also contributes to the broader aim of transforming the traditional film tourism paradigm.

5.3 Embedding through social connections and shared memory

The 'Record & Online Community' feature provides an open space for film enthusiasts to share their film tourism experiences. This feature facilitates not only the preservation of photos and videos created in the 'Creation Space' but also the sharing of the thoughts and ideas behind these creations. This social feature moves beyond the conventional one-way interaction between individuals and film locations, introducing a multidimensional hub for interaction (Dredge & Jenkins, 2003). Emphasising the social attributes inherent in the application, it encourages interaction among users who have visited the same destinations. This enables communication, the exchange of feelings and engagement with like-minded individuals. This dynamic nature of the community extends beyond the mere exploration of movie locales, fostering a sense of belonging among members (Munar & Jacobsen, 2014). The values of the feature from both a 'functional' and 'social' perspective are realised from this aspect, providing empirical validation for this approach.

In summary, the implementation of AR technology forms the foundation of this application's design, driving its core functionality. It leverages the mobile device's camera to scan the

surrounding environment, enabling users to recreate film scenes using videos or photos. This use of AR distinguishes the application from traditional tourism offerings, enhancing the potential for a comprehensive, immersive experience and the creation of virtual content. With the proposed features, film fans can immerse themselves in real-world film settings, express their personal travel sentiments and engage with fellow enthusiasts, thereby enriching the overall film tourism experience.

6. Conclusion and future work

This paper demonstrates the significance of film tourist experiences and highlights the potential of AR technology to enhance film tourist experiences. Through a qualitative research approach, this study provides a comprehensive understanding of the current film tourists' journeys in Hong Kong, utilising methods such as interviews and a utility test conducted on site with participants. These contributions serve as valuable resources for future research, offering guidelines for designers to develop AR-enhanced applications or services that cater to the unique needs of film tourists.

The research model presented in this paper not only encapsulates the expectations and challenges of film tourism but also provides an understanding of film tourism experiences. As such, it has a two-fold impact: aiding the academic implications of film tourism and offering practical insights for app or service developers and practitioners.

Moving forward, future work will focus on two main areas. First, as the participants and film locations in this research were selected within the realm of Hong Kong's culture, the findings may have greater relevance to the East Asian cultural context due to its proximity. In future research, the design model will be tested in diverse scenarios involving different film tourists and locations to examine its applicability across various cultural settings. Second, the study will further explore the added values created by the model for the tourist experience, enhancing its adaptability and responsiveness to real-world situations. Through further refining the model and application in different content, we aim to contribute to the development of smart solutions advancing the AR-enhanced film tourism industry.

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Appendix A: Profile of interview participants

ID	Interview Location	Residence	Age	HK Travel Experience	AR Tech Experience	Intentional Activities	Experience Satisfaction
1	Fruit Market, Yau Ma Tei	Mainland China	35	2 times	Unfamiliar	1. Imitate Jackie Chan's pose and take photo; 2. Shoot videos; 3. Post on social media (WeChat)	Dissatisfied
2	Fruit Market, Yau Ma Tei	Hong Kong SAR	60	Local	Unfamiliar	1. Take a walk; 2. Buy some fruit; 3. Relax and enjoy	Neutral
3	Chan Chi Kee, Yau Ma Tei	Hong Kong SAR	58	Local	Unfamiliar	1. Buy a kitchen set as a souvenir of the film tour	Dissatisfied
4	Meido Cafe, Yau Ma Tei	Hong Kong SAR	40	Local	Unfamiliar	1. Take a break and feel the atmosphere of the film; 2. Have a meal	Satisfied
5	Meido Cafe, Yau Ma Tei	Hong Kong SAR	53	Local	Unfamiliar	1. Eat the same food from the film; 2. Take photo	Neutral
6	Tin Hau Temple, Yau Ma Tei	Hong Kong SAR	68	Local	Unfamiliar	1. Take a break 2. Review the film	Dissatisfied
7	Temple St., Yau Ma Tei	Mainland China	26	3 times	Familiar	1. Take photos; 2. Post on social media	Very dissatisfied
8	Temple St., Yau Ma Tei	Japan	/	1 time	Very familiar	1. Take photos; 2. Have a meal	Satisfied
9	Temple St., Yau Ma Tei	Mainland China	/	3 times	Familiar	1. Enjoy the night view 2. Take the same position photo	Neutral
10	Bo Lun Building, Yau Ma Tei	Hong Kong, SAR	25	Local	Very familiar	1. Imitate the character; 2. Take the photo	Dissatisfied
11	Dragon Center, Sham Shui Po	Mainland China	30	1 time	Familiar	1. Fandom of Leslie Cheung	Neutral
12	Dragon Center, Sham Shui Po	Mainland China	22	2 times	Very familiar	1. Dress up like the character; 2. Take a photo	Very dissatisfied
13	Audio Space, Sham Shui Po	Hong Kong, SAR	29	Local	Familiar	1. Take photos	Dissatisfied
14	Audio Space, Sham Shui Po	Mainland China	35	2 times	Familiar	1. Take photos; 2. Post on social media	Neutral
15	Audio Space, Sham Shui Po	Mainland China	20	5 times	Very familiar	1. Act the classic scene of the film with friends; 2. Recording a video	Satisfied
16	Audio Space, Sham Shui Po	Hong Kong, SAR	22	Local	Familiar	1. Review the classic plot in the scene; 2. Match the real view with the film scene	Dissatisfied
17	Tai Nan Street, Sham Shui Po	Macau SAR	/	10 times	Familiar	1. Take the same-angle photo	Neutral
18	Tai Nan Street, Sham Shui Po	Hong Kong, SAR	/	Local	Familiar	1. View the same scene in the film	Neutral
19	Tai Nan Street, Sham Shui Po	Mainland China	30	5 times	Familiar	1. Imitate the character's pose; 2. Take the photo	Very dissatisfied

Appendix B: Ten observed film sites

No.	Film Site Name	Estate	Location	Related Films	Observed Factors
1	Yau Ma Tei, Wholesale Fruit Market	Public	202 Reclamation St., Yau Ma Tei, Kowloon	*Rob-B-Hood; As Tears Go By*	1. Layout; 2. Architecture; 3. Components; 4. Flow of people; 5. Historical or cultural significance
2	Chan Chi Kee	Private	316, G/F, 318 Shanghai St., Yau Ma Tei, Kowloon	*Made in Hong Kong*	1. Lighting; 2. Layout; 3. Visitors
3	Mido Cafe	Private	63 Temple St., Yau Ma Tei, Kowloon	*Chasing the Dragon; Old Time Buddy*	1. Lighting; 2. Layout; 3. Visitors
4	Tin Hau Temple	Public	56-58 Temple St., Yau Ma Tei, Kowloon	*Endless Love*	1. Architecture; 2. Flow of people; 3. Composition and framing; 4. Cultural significance
5	Temple St.	Public	Yau Ma Tei, Kowloon	*Shock Wave; The Confidence Man JP; God of Cookery*	1. Architecture; 2. Composition and framing; 3. Flow of people; 4.Cultural significance
6	Bo Lun Building	Public	28 ~ 34 Battery St., Yau Ma Tei, Kowloon	*Ghost in the Shell*	1. Layout; 2. Lighting; 3. Composition and framing; 4. Accessibility
7	Dragon Center	Public	Dragon Centre, Yen Chow St., Sham Shui Po, Kowloon	*He's a Woman, She's a Man; The Gem of Life*	1. Layout; 2. Lighting; 3. Composition and framing
8	Audio Space	Private	San Po Kong, Tai Yau St., No. 33 Jiali Industrial Building, Build 18, Room 04	*Infernal Affairs; Infernal Affairs 3: End Inferno*	1. Layout; 2. Components; 3. Composition and framing; 4. Visitors; 5. Accessibility
9	Tai Nan Street	Public	264 Tai Nan Street, Sham Shuipo	*Ghost in the Shell; Transformers 4: Age of Extinction; Lost in Hong Kong*	1. Composition and framing; 2. Flow of people; 3. Environmental factors
10	Be Tabula Rasa	Private	Yau Fung Building, Lai Chi Kok Rd, Mong Kok, Hong Kong	*Love off the Cuff*	1. Layout; 2. Components; 3. Lighting; 4. Accessibility