UNREAL MEMORIES:
THE COLLECTIVE IMAGE OF ARCHITECTURE IN VISUAL SOCIAL NETWORKS

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UNREAL MEMORIES: LA IMAGEN COLECTIVA DE LA ARQUITECTURA EN REDES SOCIALES VISUALES

RESUMEN: Las imágenes de arquitectura se propagan rápidamente en las redes sociales visuales que ganan interés para difundir y comunicar la arquitectura. Por ello, es imprescindible diagnosticar el proceso de la construcción social de la imagen de la arquitectura, explorar las restricciones y formatos de publicación de la plataforma, identificar los hábitos de reacción y difusión con relación a los rasgos visuales de la fotografía y ahondar en las posibilidades y los riesgos que introducen los sistemas de inteligencia artificial (IA). El método de investigación sigue un enfoque de asociación cognitiva a través del análisis de varios estudios de casos gráficos en Instagram. El diseño exploratorio para abordar el papel de la imagen para comunicar la arquitectura en las redes sociales visuales surge del concepto de fragmento y de la visión sesgada, división requerida por la naturaleza de las sugerencias de imágenes relacionadas como método de navegación en Instagram. Los hallazgos identifican oportunidades y estrategias de acción para complementar los contenidos que construyen la imagen colectiva de la arquitectura adaptados a la lógica del nuevo escenario.

PALABRAS CLAVE: comunicación visual, entorno construido, expresión gráfica arquitectónica, patrimonio cultural, visualización de datos

ABSTRACT: Images of architecture spread quickly on visual social networks that gain interest to disseminate and communicate architecture. For this reason, it is a must to diagnose the social construction of the image of architecture, to explore the restrictions and publication formats of the platform, to identify the reaction and dissemination habits in relation to the visual features of photography and to delve into the possibilities and the risks introduced by artificial intelligence systems. The research method follows a cognitive association approach through various graphic case studies on Instagram. The exploratory design to approach the role of the image to communicate architecture in visual social media arises from the concept of the fragment and the biased vision, a division required due to the nature of related image suggestions as a browsing method on Instagram. The findings identify opportunities and action strategies to complement the contents that build the collective image of architecture adapted to the logic of the new scenario.

KEYWORDS: architectural graphics, built environment, cultural heritage, data visualization, visual communication

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1. Introduction

Architectural graphics techniques are diverse and wide-ranging in terms of representation, but photography has reached a preferred use for communicating architecture in all media. Le Corbusier disseminated his work through this artistic technique, managing detailed quality control, production and publication of his photographs. Thus, his images and branding tactic in architecture prevail (Zaparaín Hernández, 2015).

The importance of image control is especially useful for the communication strategies of architectural publishers. In the current scenario, it is appropriate to approach their involvement in social networks based on visual content, due to its ease of determining the behaviour of people with space (Ghermandi, 2022) and reaching a larger audience than in the previous ones (Chen, Lai and Yu, 2021).

In these user-generated content environments (Wyrwoll, 2014), all people have the same rights and opportunities to publish and read, and the relevance of the publications is the result of their own reach. Information spreads without restrictions (except for product promotions and censorship of some topics), and collaborative participation increases the variety of content that users consume in seconds, even losing its value.

On social media, users select certain locations, choose a visual angle, come up with topic-related hashtags and apply filters to produce an image to share with their followers. Instagram users convey a sense of what is attractive or interesting even when they share images without prior design or planning, an issue that can have a high impact on how to understand architecture, especially if the message is biased (Kelley, 2014). These interactions between users lead to unequal dynamics that give greater recognition to certain places (Graham, Zook and Boulton, 2013), linked to a user stratification process (Castells, 2015). Given this communication model, the following questions arise:

- What is the representation of the city and architecture that users share?
- How do the users build that collective image?
- What is the role of the architecture in the dissemination of architectural content in these media?

Therefore, the main goal of this research is to deepen in the construction of the collective image. Firstly, this study will review the literature on collaborative content creation and its relationship with behaviors towards architecture and the city. Additionally, it will explore the implications of visual qualities and publication formats on the positioning of pictures within image social networks, analogous to search engine optimization in traditional web platforms. Subsequently, three case studies are designed to cover the construction of the collective image. The first case study will explore the variety of content according to the intention of the photo in architectural communication on the same project, through a comparison of images of the Torres Blancas building in three broadcast media. The second case study will pursue the fragmentation in the construction of the collective image, deciphering in the process which areas of the building are most frequently communicated on Instagram, for which the collective image of the María Pita Square will materialize. And the third case study will approach the unreal contributions to the collective image through the creation of images of a real place using two artificial intelligence tools, as a parallel process of construction of the collective image.

The novelty of this research consists in the experimental approach to thoroughly examine the collective image of architecture through the formulation of graphic methods and previously unpublished visual examples. In addition, the research design includes an analysis procedure through photo-editing, a new approach to the application of photogrammetry technique and the generation of images with artificial intelligence from prompts (textual descriptions).

2. Literature review

2.1. The influence of social media on the construction of a collective image of architecture

While user-generated content on broadcast media can contribute to the construction of a collective image framework that shapes people's perceptions and behaviors towards architecture and urban spaces (Mahmoudi Farahani, Motamed and Ghadirinia, 2018), it is important to recognize that this content can be fragmented, biased or incomplete. As a result, participation in digital communication creates a new form of subjectivity (Lovink, 2011).
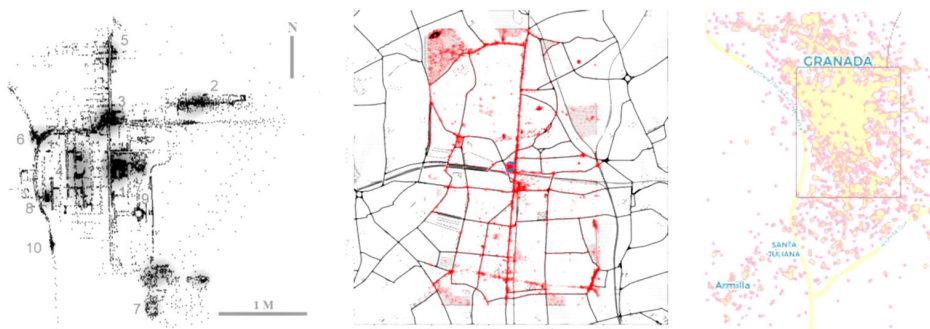
Figure 1: [left] Spatial distribution of the photographs with the Kernel density method (Al-Kodmany, 2019), https://doi.org/10.3390/buildings9080187; [mid] Location of geolocated images (Valls et al., 2017), https://doi.org/10.1016/j.tele.2017.09.015; [right] Heat map of the main points of Granada according to Instagram users (Cantón Correa and Alberich-Pascual, 2019), https://doi.org/10.3145/epi.2019.ene.08

The theory of collective memory (Halbwachs, 1947) conjectured that individual memories are always shaped by the social frameworks within which they are formed. It is a social product that is constructed and reconstructed through social interactions and shared experiences. In this broadcast media users share and consume images on these platforms building a collective image (Mahmoudi Farahani, Motamed and Ghadirinia, 2018) which alters the construction of the memory framework.

Although the collective image created by user-generated content can be influential in shaping perceptions of urban spaces, it may not always be a comprehensive or accurate representation of reality. And there is no way to know the global result of the user generated content on the architectural experience. Therefore, it is necessary to identify and evaluate the content of architecture that is published on these platforms, in order to understand which are redundant or missing.

In fact, urban tourism and the social imaginary can sometimes lead to the development of a stereotyped iconography of destinations, creating a virtual landscape that is far from the reality of the surrounding urbanism (Silvano, 2009). Despite these limitations, these images remain an important source of information that helps to determine the qualities and perceptions of urban spaces, and can also explain the influence of urban transformation on the socialization of public space (López-Baeza, Serrano-Estrada and Nolasco-Cirugeda, 2016).

Social networks provide information on behaviors of a population profile in the city, since they supply geolocation indexed information. The visual identification of the publications on the city plan can shed light on the use of the city (figure 1), a typology of buildings or recreational areas, as well as detect areas of visual attraction (Cantón-Correa and Alberich-Pascual, 2018). Geo-tagged images lead to interpret which urban elements can represent the identity of a city such as green spaces and architecture (Zhou et al., 2014) and how its users perceive the environment, from a safe place to a boring or lifeless one (Zhang et al., 2018).

These findings translate large-scale movement behaviors to the city plan, which make it possible to identify citizen needs and consider them in architectural design (Valls et al., 2018). But they do not provide information on how people approach architecture, where they place their attention, how they live that experience and how they share it.

User's photos manifest human behaviors on the perception of architecture and habits of publication and sharing, but do not explain why they happen. Some techniques to increase reach are hashtags and keywords, among other search engine optimization tactics. Also, in visual media, image features and their perception by users lead to social reaction tendencies. Consequently, the reaction metrics (likes, comments, saves and shares) promote those images as a reference through greater visibility to users on the platform.

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2.2. Architecture positioning in social media: visual characteristics and publishing formats

Once we have access to the information that people share on social media, the next step is to understand how the qualities of the image can influence its reach and impact on those platforms. In other words, how we can design and create images that are more likely to be noticed and shared by others, and that can contribute to a more complete and accurate representation of the city or the architectural space in question.

The presence of the human figure is key to the perception of an architectural image. It provides scale, dynamism and functional and place context (Saló Samarán, 2019). The images that capture moments of humans using the spaces are more faithful to reality. They communicate the functional, cultural, and environmental context and complete a message about the experience of the architectural space. However, despite studies that linked the appearance of people's faces in photographs with an increase in positive reactions (Bakhshi, Shamma and Gilbert, 2014), the human presence in images of architectural heritage on Instagram received less acceptance (López-Chao and López-Pena, 2020), a collective vision that distances people from the built heritage. Images can include human figures for different purposes: people, stories on a stage, a place designed for humans or architecture. This issue must be considered from the early stages because it will depend on the type of shot, the detail or focus on the person or the architecture, or the ratio of canvas that both will occupy.

Furthermore, the platform entails constraints that condition the apparent free publication and reading. Smartphones are the usual consumer device for Instagram and the canvas format of a post is square. Therefore, the base condition implies that the consumption of the images is on small screens in vertical format. Thus, the inscribed square admits images of very different proportions to traditional standards and it states a challenge of composition and perspective to catch the users' eyes. Under these conditions, two-point perspectives generate imaginary lines that guide the view off the screen, while one-point perspective relies on visual lines that focus areas of interest within a small canvas. These conclusions are exclusive to the small vertical format of smartphones and are not rules on types of perspective, in larger dimensions for a photograph with its own expressive limitations (Franco Taboada, 2011).

In addition, composition rules significantly influence these platforms. Images that employ compositional techniques, such as the rule of thirds, demonstrate a direct correlation with positive user reactions, including higher likes, comments and engagement. Previous literature found relationships between the level of compositional complexity, the density of information and its reach in social networks. Thus, the natural balance between the level of information and the complexity of the image composition obtains a greater reach, achieved through greater complexity in images with less information or vice versa (Thömmes and Hübner, 2018).

The seminal work of theorists such as Alexander Galloway around digital platforms and the constraints of their formats may influence the way users perceive and consume content (Galloway, 2004). Therefore, it is necessary to consider specific formats of the platform as well as the usage habits that users make to know how it can influence the architecture content. The type of publication of the photograph and the editorial strategy are key to reaching a larger audience. Content typology trends rise and fall in popularity very quickly. In this sense, previous literature found that the possibilities of editing images, their composition and the choice of filters influence their promotion (Carrasco-Polaino, Villar-Cirujano and Martín-Cárdaba, 2018). Consequently, the image editing software and the camera contribute to immerse the user in the image (da Cruz, 2021). However, the indiscriminate use of strategies that are effective in promoting the visibility of images can undermine the original message or purpose behind the architectural image being shared. Thus, some fashions such as the white frames around the images (known as the Polaroid effect) identify the profiles of some users. However, the size of the image will be smaller and will complicate its understanding.

In this way, the positioning of a set of architecture images (through hashtags or a single profile) should reach a larger audience if they diversify publication strategies. For example, the slider photo carousel better communicates a set of related images in one post than posting each photo in multiple posts in a series. Thus, the fragments of an image within the carousel favor comprehension due to the association of information between them, while

those of the mosaic of a user's profile wall will only be understood if someone accesses it. Furthermore, the user attention span for each image is very short, which is why these platforms reward the retention of viewers in a post. This premise is relevant to properly dose messages into understandable fragments.

3. Methods and research design

This article questions the role of architecture on the collective image of architecture on Instagram. Additionally, this research presents graphic tools that can help us better comprehend the collective image of architecture on Instagram and assist in the selection of architectural information. These strategies have the potential to facilitate the dissemination of architecture to the public and promote important values of it. For this, three case studies were designed and developed:

-To explore the diversity of the architectural content (aesthetic or functional qualities, among others) across different broadcast media and how these representations shape our perceptions and meanings, the first case study describes and compares different representations of architecture. The goal was to identify differences in the qualities they conveyed by collecting examples and using them to illustrate these differences.

- The second case study delves into the construction of the collective image of a place from Instagram post images. This approach involved using photogrammetry software to analyze collective images, which is a new way of exploring these images. It is also experimental as the photographs of social media were manipulated to observe their effect on the three-dimensional vision of collective memory.

- The third case study was experimental and comparative, examining the construction of the collective image through unreal contributions. It involved using two different artificial intelligence models to generate images of a real place, including abstract and photorealistic results. The goal was to compare the images generated by the two AI models and to identify their similarities and differences.

The method follows a cognitive association approach and subsequent synthesis of research developments in the line of architecture and photography on Instagram over a period of five years. Regarding the architectural graphics research method (López-Chao, Amado and Miotto Bruscato, 2022), this paper provides image analysis strategies, photo-editing procedures to visualize the collective image of architecture, an application of photogrammetry under a creative artistic approach, and a comparison of abstraction and realism in images generated by artificial intelligence systems.

4. Case studies

4.1. The contribution to the collective image by the broadcast media

Under a sociocultural approach, it is worth delving into the influence of different broadcast platforms to transfer architectural knowledge to their users. Architecture receives little attention compared to disciplines such as cinema, music or painting on visual social networks, but when they interact, it acquires value and interest in the cultural mainstream. These architectural cameos are an alternative to communicate a broad and diverse image of architecture.

The case of Torres Blancas in Madrid, designed by Sáenz de Oiza in 1969, exposes some examples of dissemination through other artistic disciplines: a magazine, two video clips and a movie trailer. The images convey fragmented messages that avoid or modify the context of the building, turning it into an iconic object (figure 2). The first case emphasizes geometric qualities, as well as the composition, and directs the gaze towards the tectonic qualities of the materials through color saturation and brightness. The second tells a story including people and without hiding the current state of the building due to the passage of time, using a low angle shot to highlight the dimensions of the tower. Finally, the third radically deprives its context and even designs a logo for it (bottom left) under an instrumental approach to the script.

More and more companies that manage tourist destinations promote themselves through marketing campaigns on Instagram, hiring influencers who drive their search (da Cruz, 2022). Regarding other influential features, previous research showed that beautiful
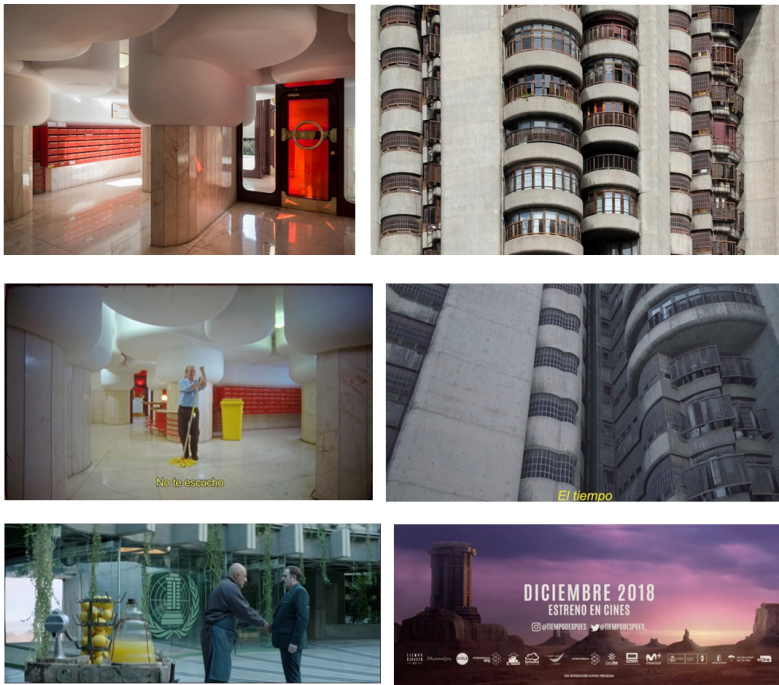
Figure 2: [top left] Photography Clouds and Red, Torres Blancas, Madrid, Ana Amado, 2022. Arquitectura Viva. https://arquitecturaviva.com/articulos/tres-camaras-indiscretas; [top right] Photography Gran Premio COAM 50: Torres Blancas, 2022. Arquitectura Viva, Depositphotos. https://arquitecturaviva.com/articulos/torres-blancas-y-madrid-rio-gran-premio-coam-50; [mid left] Frame from the music video Los tontos, C. Tangana and Kiko Veneno (directed by Corzo and Javier Ruiz), 2021. YouTube. https://www.youtube.com/watch?v=vjWyRfnR5CQ; [mid right] Frame from the music video Torres Blancas, by PLEENS, Belice Visuals (directed by Manuel León), 2020. YouTube. https://www.youtube.com/watch?v=-iOLu-9MA1eQ; [bottom left/right] Frames from the trailer of the film Tiempo Después, José Luis Cuerda, 2018. YouTube. https://youtu.be/m09n5HTH2Qk

Instagram images attracted more users to architectural heritage declared by UNESCO as a world heritage site (Falk and Hagsten, 2022), while the loss of this status was one of the main reasons for the drop in interest. This result brings to light that public strategies for cultural promotion could be beneficial for the enhancement of architectural elements.

If we are able to consciously articulate our ideas about architecture, we can create visual representations that effectively communicate these concepts. By emphasizing conscious fragments of our ideas, we can create architecture messages that are more easily understandable and suitable for quick dissemination on social media. This approach can complement the existing collaborative content creation process, helping to produce a collective image that promotes and values a certain architectural paradigm, even if it may differ from traditional architectural canons.

The graphic technique should favor the management of architecture in small doses. Different authors have divided circulation experiences into serial visions (achievement of scenes like a storyboard) to communicate emotions and spatial experiences, offering a more complete message (Baudat, 2013). The architecture focus on experiences centered on the senses and the perception of places can arouse their interest in users, even taking them to the place and making them feel the architecture (Fuente Suárez, 2016). Other digital formats involve more senses than sight, such as video, immersive virtual and augmented reality experiences, or 360 photographs. It must be considered, though, that the strategies will not have the same effect on all users, since their behavior, attitude and memory will depend on personal inclinations (Djafarova and Rushworth, 2017).

4.2. The procedure to materialize the collective image

A research dissertation on visual analysis and production of the collective image of a place was proposed and supervised (Ledo Romay, 2021). The procedural design collected the visual information of a building generated by Instagram users and defined criteria to overlap the images and consequently build a graphic representation of its collective memory. It can

Figure 3: [left] Overlapping of photographs located at two distances from the town hall on the same street, drawing and editing, Ledo Romay, 2021; [right] Overlapping of cropped photographs on the east elevation of the A Coruña City Hall, where the colors of the frames identify the distance of each photograph, Ledo Romay, 2021.

Figure 4: Greyscale orthoimage of the collective vision of the facade of the town hall square in A Coruña, Ledo Romay, 2021.

be formally related to the method developed by the Swiss photographer Corinne Vionnet, who, in her research Photo Opportunities (Vionnet, 2011), uses tourist images obtained from the Internet applying overlapping strategies, finally obtaining results that condense the collective visual memory of the place (Luna Lozano and Martín Martínez, 2022).

In the analyzed procedure, the opacity percentage of each photograph depended on its distance from the building due to its relationship with the level of detail it provided and the ratio of the surface of the building to the canvas. Additionally, a horizon line served to position all the photographs, scale them and minimally correct the perspectives (figure 3 [left]). Cuts were later applied to prevent further deformation (figure 3 [right]), the higher density of overlapping images showing its greater reach in the social network.

The results of this procedure discover new behaviors related to published information, points of view and how users approach a building or design elements that capture their attention. But, above all, it frames those areas that disappear, lost information in the collective memory. Therefore, the tool identifies information that is missing from this visual media and allows decisions to be made for the purposes of protection, awareness, or dissemination of architecture. One of the curiosities of the result (figure 4) is the presence of people at different moments in time that contextualize the collective memory.

The idea of building a collective image through user photographs can be replicated with photogrammetry technology to obtain a three-dimensional mesh of creative artistic character (figure 5). The orthoimage of the mesh (figure 6) displays similarities with the previous image at the areas of detail level. Nevertheless, it projects an idealized portrait of the building and the environment due to the saturation of colors and a clear climate that contrasts with the characteristic meteorological reality of the northwest of Spain. Previous literature proved that Instagram users look for aesthetic ideals in their images and build positive views that differ from the reality of the place (Boy and Uitermark, 2017).

These contributions are also useful on a smaller scale to analyze the areas of interest and scan paths. Users decide which images to share from the place where they were. Therefore, it could be of value to delve into the behaviors and emotions in relation to the movements of people in the city and the points of view chosen through visual techniques (Fernández-Álvarez and López-Chao, 2022). The results would guide the definition of bases to create messages committed to the communication of architecture that transmits emotion to users.

4.3. The unreal contribution to the collective image

Realistic representations on Instagram regularly receive visual and aesthetic experimentation that transforms the image with the use of filters, editing and deformation of characteristics such as dimensions or color. Thus, the collective result generated by users

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Figure 5: Zoom on the mesh to visualize the artistic character of the collective memory generated by photogrammetry technology, the authors, 2022.

Figure 6: Orthoimage of the mesh on the collective vision of the facade of the town hall square in A Coruña using photogrammetry techniques in the Autodesk Recap Photo software, the authors, 2022.

modifies, hides or transforms the reality (Rodríguez Becerril and Fortuna, 2021). AI training achieves these realistic results from thousands of images from a global collective memory, data that has sometimes not been properly filtered (Ntoutsi et al., 2020). Depending on the characteristics of the AI, it will lead to more abstract images or with a greater degree of detail, but which reflect the idea requested by the user (figure 7).

Global access to these technologies has brought endless possibilities to create realistic images. Some results could provide recognizable images of the built environment that provide unreal information that is not identifiable by a non-expert (figure 8) and, thus, contribute to a chaos about city and architecture information. The current debate revolves around the protection of the intellectual property of the sources for the training of AI and the destruction of certain jobs. However, this technology can confuse, complicate and generate disbelief at visual sources, which have traditionally been a criterion of guarantee of reliability. This issue is particularly relevant in higher education. Architecture undergraduate students increasingly focus their attention on these user-content generated media, despite the fact that they recognize higher quality in traditional media, such as books and specialized magazines (Amado Lorenzo and López-Chao, 2021).

5. Discussion and conclusions

The informative role of photography and its large audience in visual social networks urgently require research on the image of architecture that users build and spread. The medium entails the publication of posts that users will see together with other related images or

Figure 7: Images generated with Craiyon AI on María Pita Square, the authors, 2022.

Figure 8: Images generated with Dall-e AI on María Pita Square, the authors, 2022.

from users they follow, so communicating ideas through related images is not the nature or purpose of the platform.

In these media, images are fragments that reproduce a biased architecture experience, and the user-generated content produces the collective image of a place that explains behaviors about its relationship with the city and architecture. Some visual possibilities identify city portraits on its plan and others overlay photographs of a building to identify shared and missing building information.

The research conducted in this study sheds light on the critical role of broadcast media in shaping our perceptions and meanings of architecture. The findings highlight the importance of conscious articulation of architectural ideas through visual representations, which can facilitate the creation of content that is easily understandable and accessible for dissemination on social media. This approach can also help to create more engaging and captivating architectural content, which in turn can generate greater public interest and appreciation for the field.

This research applied an unprecedented approach through photogrammetric techniques to generate three-dimensional meshes of creative artistic nature from users' photographs. The results shed light on the aesthetic idealized processes that users pursue in the photos they share, which evidences that the visual characteristics of the reconstructed 3D model can reveal aspects of the collective image that are not immediately apparent in the individual photographs. This proves that visual tools detect gaps in published architecture content and note as a priority the design of strategies to communicate the architecture considering the restrictions of the platform and its consumer habits. However, image positioning strategies should not undermine the architectural message.

For this reason, it is necessary to understand how architectural photographs promote user reactions and visibility on social media, considering their visual characteristics and the fundamentals of image publishing formats on Instagram. On the one hand, the presence of the human figure, the format, the type of linear perspective and the compositional complexity directly influence the visibility and reach of the audience. On the other hand, image designs and communication strategies must consider publishing restrictions: the size of the consumption device, the formats that associate several images in the same post, the guidelines for grouping and ordering relevant information by topic in the user profile, and the user attention span.

In addition, users edit photographs by modifying the representation of the architecture, under the premises of improving the image in terms of user reactions (color and contrast saturation, clipping elements out of context, etc.). Meanwhile, the images generated by AI systems about real places promote unreal visual information and can become part of the collective image. On the one hand, the fact that the AI models produced both abstract and photorealistic images suggests that there is a wide range of possible outcomes when using this technology. This reinforces the idea that AI can be used to transform, hide, or modify reality in various ways, which can have implications for the reliability of visual sources. On the other hand, the focus on a real place in the experiment highlights the potential impact of AI-generated images on the perception and understanding of built environments. If the AI models produce images that are significantly different from reality, this could create confusion and complicate efforts to accurately represent or understand a place.

Collaborative contributions encompass repetitive content, missing information, edited references, and unreal images based on information sources from the collective memory. A deceptive vision that leads to perceive the photographs as an unreliable source of information and that requires attention.

Not everything is negative. These findings brought to light acting opportunities for architects, photographers, publishers, academics, associations and public heritage conservation institutions. The manuscript provides strategies that make it easier to find out what information is missing from the architecture, how to create content appropriate to the consumption habits of users, how to understand the publishing formats of the visual social network to reach more audiences and how to define conscious fragments in the process of construction of the collective image of architecture.

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