

ADAA7006 Coexistent Perspectives Module

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A Time-Based Parametric Interactive Experience

Inspired by the Light Spectrum of the Sagrada Família

1 Project Focus and Context

This project designed a time-driven web interaction system based on the light and shadow design of the stained glass windows of the Sagrada Família. The aim was to enable users to experience the changing light and shadow effects of the building over time while browsing the web, and to further understand the value of the Sagrada Família as a cultural heritage. The initial idea actually came from a very ordinary preparation for a visit. Although the official ticket reservation website provided reservation links for different time periods, it did not explain what these times meant. Later, after researching, it was discovered that the stained glass windows inside the Sagrada Família change color and atmosphere as the position of the sun changes. Many tourists only realized this when they arrived at the site.

This question prompts one to ponder: apart from handling reservations and displaying information, how can a cultural heritage website fulfill more functions? For Sagrada Família, what truly captivates people is not just the building itself, but the spatial experience created by the constantly changing light. Just as Rasmussen (1964) and Plummer (2012) expounded in architectural theory, natural light is not only a medium for revealing forms, but also a core element in shaping the atmosphere and perception of the space. If the website only displays a few photos and a brief introduction, then what users see is merely the building, rather than its true charm. Therefore, this project is not merely an appointment assistance tool; instead, it transforms the changes in light into a content that can be experienced online and explored actively, allowing users to build interest in the building before the visit. Another entry point of this research stems from observing the methods of donating cultural heritage. Many official websites have a donation section, but usually it's just a button, which users tend to overlook and have difficulty feeling a sense of participation. This research does not aim to turn the website into a commercial platform; instead, it hopes to make donation a natural extension of the entire experience. When users have understood the light and the building, and then complete a micro-donation through purchasing digital wallpapers or commemorative light works, this participation method may be more acceptable than directly requesting a donation.

Therefore, the ultimate focus of this project is not on the web page itself, but on whether digital design can help users establish a connection between them and cultural heritage. Rather than providing more information, it is hoped that what users will remember when they leave the web page is the light of the Sagrada Família, rather than the functions on the page.

2 Research and Design Development

The initial development of the project was relatively straightforward. I originally intended to create a web page as a time query tool, where users could input a date and see the possible color window light and shadow effects on that day. Later, I increasingly felt that it was becoming more and more like a weather forecast website, although it had complete functions, it lacked the reason to attract users to stay. The real change in the project direction was not the technology, but some design theories I read later.

Donald Norman's theory of emotional design states that users' experience of using a product is not only determined by functionality, but also begins with instinctive visual and sensory stimulation (Norman, 2004). This was the first time I seriously considered what exactly makes a webpage truly captivating. I began to realize that after users enter a webpage, they do not first analyze whether the functions are complete, but rather first feel the atmosphere of the entire interface. Therefore, I removed all the explanatory text originally placed on the homepage and replaced it with dynamic scenes of stained glass windows and light effects, hoping that the first reaction of users when entering the webpage would not be reading, but watching. This point later also influenced the entire interaction process. The selection of time, date input, and result generation were all kept as simple as possible, because what truly matters is the emotion generated by users when viewing the changes in the light and shadow, rather than the operation process itself.

Another influential theory is the "Generous Interface" proposed by Mitchell Whitelaw (2015). This theory states that digital cultural heritage websites should go beyond the limitations of traditional search boxes and text lists, and utilize rich horizontal browsing, visual displays, and open layouts to encourage users to actively explore without a clear goal, thereby enhancing the discoverability and participation of cultural heritage. This interface form can significantly improve users' exploration behavior and experience (Li et al., 2024). I was deeply impressed by this. In the earlier version, I added many classification buttons, such as history, architecture, and window color introduction, which seemed complete, but the entire browsing method was no different from that of ordinary official websites. Later, I weakened these contents and placed the timeline in the center of the page, allowing users to drag the time to observe the color changes. After doing this, the web page began to have a bit of the feeling of "visiting an exhibition" rather than just searching for information.

Regarding the donation aspect, I referred to the research by Kwak et al. (2023). Their theory states that when charity websites maintain consistency in visual elements such as color, font, and layout, it can effectively enhance users' visual rhetoric perception, improve their evaluation of the website's professionalism and trustworthiness, and thereby significantly increase the willingness to donate (The Effect of Charity Website Design on Perceived Consistency and Its Consequences; Kwak et al., 2023). This finding led me to

reorganize the entire visual system, including the color of the stained glass windows, the interface style, and the button layout, all of which are strictly kept uniform. I did not deliberately emphasize the donation button but instead aimed to establish trust through a consistent overall visual style first, and then naturally guide users into the donation process.

Additionally, Refik Anadol's public art piece "Living Architecture: Casa Batlló" also greatly inspired me. This project converts real-time urban climate data into dynamic visuals and projects them onto the building's facade through digital light projection (projection mapping), transforming the originally abstract data into an intuitive sensory experience (Anadol, 2022). This case made me realize that data itself does not necessarily need to be explained through a lot of text; as long as the appropriate visual expression method is found, it can actively attract viewers to observe and understand. This also prompted me to re-think the presentation of time and light on the web page, hoping that users will not only see the query results but also be able to feel the spatial atmosphere formed by the colored window light and shadow through the dynamic changes.



Looking back, these studies did not actually change my visual style; instead, they made me constantly re-examine the design goals. The web page initially aimed to "inform users about light and shadow", but gradually evolved into "allowing users to discover light and shadow themselves". This change was the most significant shift in the entire project.

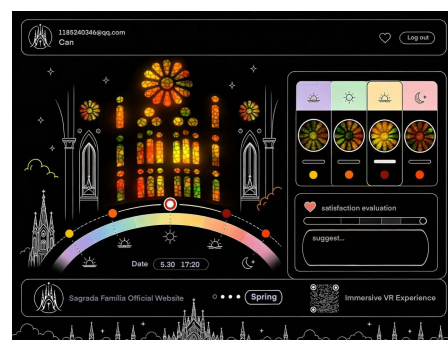
3. Critical Analysis of Process and Outcome

Throughout the entire project, the aspect that I made the most revisions to was not the visual style, but the interaction logic of the website. Looking back, there

were three key decisions that truly influenced the final outcome. These decisions almost completely changed the direction of the entire project.

The first decision was to make "time" the core of the entire website, rather than the building itself. Initially, I attempted to organize the content in the same way as ordinary cultural heritage websites, placing the architectural history, stained glass descriptions, and reservation information on separate pages, hoping that users could quickly find the information they needed. However, after creating the prototype, I realized that although this approach was clear, it lost the most distinctive feature of the Sagrada Familia. Users saw only static information, rather than the vitality of the building changing throughout the day. Later, I rethought this, and what I truly wanted to address was not "introducing the Sagrada Familia", but to help users understand that entering the church at different times would provide completely different experiences. Eventually, I placed the timeline at the most important position on the website. When users dragged the time, the color of the stained glass, particle effects, and the background of the page would change, and the architectural introduction was relegated to an auxiliary information position.

The second decision was to abandon using real photos as the main visual content and instead use TouchDesigner to generate dynamic lighting effects. At the beginning of the project, I collected many photos of the stained glass windows of the Sagrada Familia, hoping to use photography to directly showcase the color changes at different times. To this end, I tried two software, Figma and Procreate. The two design styles were in Figma, I simplified the static photos of the Sagrada Familia church into black-and-white line drawings, which served as the background decoration for the web design. However, these line drawings, although realistic, could only capture a single moment and were difficult to convey the feeling of the continuous flow of light (as shown in the left image). Later, I attempted to extract the colors of the stained glass windows and use particle and fluid algorithms in TouchDesigner to regenerate dynamic images. Then, I imported the particle-flowing images into Procreate for web design. After doing this, the web began to truly represent "time", and what the user saw was no longer a single photo, but a constantly changing process of light and shadow (as shown in the right image). I think this approach better suits the characteristics of digital media and the web interaction itself, rather than simply moving the photos onto the screen.



The third decision was to place the donation option at the very end of the entire browsing process, rather than on the homepage as is common on many official websites. Initially, I also tried placing the "Donate" button directly on the homepage, but the overall effect felt rather abrupt. Users had just entered the webpage and hadn't yet understood the project content, yet they were asked to make a donation. This was likely to cause resistance from users. Later, based on Norman's perspective on emotional experience, I reorganized the browsing sequence. Users first browse through the stained glass windows and light effects, select the time they are interested in, and can also input their birthday or anniversary to generate personalized light effects. After the user has completed the entire experience, the background of the current ongoing construction of the Sagrada Familia is introduced, along with providing digital wallpaper downloads and a micro-donation link. I hope that donation is not a one-time consumption but a natural extension after the entire experience is over. From the perspective of project logic, this process is more in line with the user's psychology and also more in line with the dissemination of cultural heritage itself, rather than commercial promotion.

4. Reflection and Future Development

Through this project, my biggest realization is that design is not about constantly adding content, but about constantly removing content. At the beginning, I always felt that the webpage should provide more information - architectural history, design concepts, visiting guidelines - all of these should be included. But later, I discovered that when all the content wants to express itself, the truly important information is often drowned out. I began to gradually learn to control the design instead of accumulating it. I started to accept blank spaces and also accepted that "less is more" might be more effective than "more". For this project, after the browsing is over, if the user can remember the color of a certain period or start to think about why the same building keeps changing over time, I think this webpage has accomplished its task.

On the other hand, I also realized the importance of research in design. In the past, when doing projects, I relied more on my intuitive judgment of what was good or bad. But this project made me realize that many design decisions can actually have theoretical basis and can be continuously adjusted through user feedback. Theory does not limit design; instead, it helps me understand more clearly why I should do it this way, rather than just because of personal preference.

Of course, there are still many unfinished parts in this project. It is at the high-fidelity prototype stage and has not undergone large-scale user testing. Regarding the effectiveness of the interaction experience and the donation process, currently, it is more based on design judgment rather than actual data. In the future, I still hope to continue enriching this project. For example, connecting real-time weather and sun position data to make the website truly

present the light and shadow effects inside Sagrada Familia on that day; adding multiple language versions to facilitate the use by tourists from different countries, etc...

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