Research Article RJ-19

Researches on Multidisciplinary Approaches 2026 (1) ISSN:2791-9099

Spatial Beauty From a Neuroaesthetic Perspective: Eye Tracking Analysis of Hotel Visuals

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Abstract

Neuroaesthetics is defined as an interdisciplinary research field that examines the perceptual, cognitive, and emotional dimensions of aesthetic experiences using neuroscientific methods. A review of the literature reveals that neuroaesthetic research generally focuses on visual arts, painting, and abstract stimuli; however, empirical studies addressing architectural spaces, particularly thematic hotel architecture within the context of tourist consumption, using neuroscientific methods are limited. The aim of this study is to examine the aesthetic impact of thematic hotel architecture on consumers from a neuroaesthetic perspective using the Eye Tracking method. To this end, eight thematic hotel images operating in Antalya and notable for their architecture were selected, and the Eye Tracking Method, a neuroscientific method, was used. The research was conducted at the Fırat University Marketing and Neuromarketing Research and Application Center (FÜPNAM) with 30 participants (15 men and 15 women). The findings of the study empirically demonstrate that aesthetic experience is not limited solely to artistic stimuli, addressing the fundamental assumptions of the neuroaesthetic literature from the perspective of thematic hotel architecture. Participants showed a greater focus on hotel images with cultural and historical themes; From an architectural perspective, detail and thematic density were found to be important.

Keywords: Neuroaesthetics, Eye Tracking, Thematic Hotel.

JEL Codes: M31, Z32

Citation: Yücel, N. (2026). Spatial beauty from a neuroaesthetic perspective: Eye tracking analysis of hotel visuals. *Researches on Multidisciplinary Approaches (ROMAYA Journal)*, 2026(1).

Submission Date : 16.01.2026
Acceptance Date : 12.02.2026

1. Introduction

The concept of neuroaesthetics was first introduced by Zeki (1999). It has been defined as a scientific approach to the brain mechanisms involved in artistic experience or as a study aimed at understanding beauty perception. According to Zeki, the scientific investigation of neural responses to aesthetics and art became possible in the 1970s. These developments paved the way for systematic research into the neurophysiological foundations of aesthetic experience (Coccagna et al., 2020) and were theoretically structured as an independent discipline by Nalbantian (2008). Similar to Zeki's approach, Ramachandran (1999) focused on the experience of pleasure arising from the processing of perceptual components (Gallese & Di, 2012).

However, in recent years, cognitive neuroscience has expanded its research field, particularly in music and visual arts (Gallese and Di, 2012). This concept has made significant progress in analyzing the neurological mechanisms involved in the perception of different art forms, landscapes, and architecture (Atiyeh et al., 2025). Although approaches to the field of neuroaesthetics vary in the literature, they have essentially been addressed under two main headings: The top-down approach argues that the essence of beauty has universal, fundamental, pre-assumed principles and is broken down into the basic components of subjective aesthetic experience (Coccagna, 2022). Within this framework, understanding how the perception of beauty is formed through visual signal processing, which brain regions and neural circuits play a role in these processes, and how positive responses to a stimulus and reward and pleasure mechanisms work has been accepted as a fundamental requirement (Atiyeh et al., 2025). The bottom-up approach, on the other hand, focuses on revealing the relationships between subjective beauty experiences and findings obtained from the analysis of objective data (Coccagna, 2022).

In summary, neuroaesthetics is a scientific field that aims to understand the neural mechanisms underlying aesthetic behaviors. However, it has been criticized for neglecting important conceptual points. First, neuroaesthetics was initially accepted as a subfield of cognitive neuroscience (Gazzaniga, 1984) and integrated cognitive and neural levels of explanation of behavior into a single approach (Churchland and Sejnowski, 1988). Second, neuroaesthetics has evaluated aesthetics as a type of human cognition rather than treating it as an abstract concept; it has focused on aesthetic experiences, production processes, preferences, and choices. Third, neuroaesthetics argues that these forms of aesthetic cognition arise from the interaction of perceptual, emotional, and evaluative processes with social and contextual factors. Fourth, the creation and evaluation of works of art fall within the scope of neuroaesthetics, which does not focus solely on art (Seeley, 2011).

While neuroaesthetics deals with a broader range of aesthetically appealing objects such as kitchenware, consumer goods, graphic and industrial designs, etc., the cognitive neuroscience of art goes beyond aesthetics; it examines the understanding of a work of art or the revelation of its significance within the context of art history and criticism. In line with this information, neuroaesthetics is concerned not with a specific class of objects, but with the form of experience that arises when individuals approach objects with an aesthetic orientation (Cupchik, 1992).

Within this framework, neuroaesthetics can be defined as a field that examines the biological mechanisms and psychological processes that occur when a viewer adopts an aesthetic orientation in the process of interacting with an artistic or non-artistic object. These processes and their biological foundations are related to perception, cognition, emotion, evaluation, and social and contextual elements (Skov and Vartanian, 2009). In this context, the aim of the study is to empirically establish the relationship between architectural design and tourist psychology by examining the aesthetic impact of images of 8 thematic hotels operating in Antalya and distinguished by a specific architectural perspective on tourist consumers using neuroscientific methods.

In summary, while the existing literature has predominantly focused on classical artworks or abstract visuals, this study draws on neuroaesthetic applications situated at the intersection of architecture, tourism, marketing. By integrating a neuroaesthetic approach into the disciplines of tourism and marketing, this research seeks to address a significant gap and examines the phenomenon within a distinctive context. From a neuroaesthetic perspective, this study represents one of the comprehensive attempts to systematically investigate thematic hotel visuals through an integrated framework that combines visual attention and neuroscience-based methods. Through objective eye-tracking measures, the study illuminates how areas of visual salience are perceived differently across genders.

2. Literature Review

This study classifies the relevant literature into three main thematic categories based on methodological and content differences, and comparatively evaluates the findings and limitations of each approach. The first group of literature consists of studies focusing on neurophysiological measurements and experimental processes. These studies have demonstrated that participants' brain activities and physical responses can be measured using technological tools such as EEG, eye tracking, and neuroimaging to understand the aesthetic experience. Zeki (1999), a pioneer in the field of experimental aesthetics and neuroaesthetics, initiated the tradition of modifying stimuli and measuring perceptual responses. Galle-

se and Di (2012) examined the aesthetic experience in visual arts from a neuroscientific perspective. Coccagna et al. (2020) examined participants' neurophysiological/emotional responses and aesthetic appreciation levels in a museum setting. Coccagna et al. (2022) developed symbolic rules and models that determine whether a picture is liked or disliked based on EEG signals. Osaka (2022) examined the evaluation of images as "beautiful or ugly" based on color representation, color pair harmony, and the reward system. Palmieri et al. (2025) investigated how individuals classify artworks as "beautiful/emotional" or "ordinary" using EEG signals in a museum setting. Cheron and Maere (2025) made significant contributions to the development of neuroaesthetics by analyzing eye-tracking patterns during the viewing of artistic images and questioned the role of brain mechanisms during artistic experiences. Atiyeh et al. (2025) examined the neural processes of judgments related to the aesthetics of the human body and artistic evaluation. These studies have generally examined the aesthetic experience through binary classifications such as 'liked/disliked' and in the context of classical artworks. However, they have not directly addressed questions such as how thematic hotel images are perceived by individuals in the field of tourism, which visual elements attract attention, and how this awareness is formed through cognitive and perceptual mechanisms.

The second literature group includes studies focusing on theoretical frameworks, historical background, and conceptual models. Nadal and Skov (2015) summarized the historical development of the field and provided a theoretical framework for future research. Jacques (2021) evaluated landscape aesthetics theories in light of neuroscience findings and addressed objectivism and direct perception approaches. Magsamen (2023) proposed the "Impact Thought Framework," demonstrating how aesthetic experiences can be transferred to the fields of health and well-being. Hooper et al. (2025) identified intersections between mental awareness and cognitive neuroscience, encouraging research based on perceptual, emotional, and semantic processes. These studies examined the historical development and theoretical underpinnings of the field of neuroaesthetics and explained new conceptual frameworks in detail.

The third group of literature consists of studies covering interdisciplinary applications. Folgero et al. (2022) established a genetic and evolutionary context by drawing cognitive and artistic parallels between cave art and contemporary savant artists. Zeng et al. (2023) proposed an innovative method for aesthetic education by integrating shape grammar with neuroaesthetics. Wang et al. (2024) examined the relationship between brain activity and preferences for architectural interior contours, emphasizing the importance of revealing the underlying neural basis of these preferences through neuroimaging methods. Lin et al. (2024) proposed an interdisciplinary approach that combines computational aesthetics and neuroaesthetics, building upon traditional aesthetic findings. Hu (2025) presented BioArt-Net, a computational framework that combines visual semantic analysis with physiological signal processing. Rahman et al. (2025) aimed to develop a comprehensive equation explaining attractiveness using a computational neuroaesthetic approach. Although these studies have developed new methods or application areas by combining neuroaesthetics with different disciplines such as computer science (artificial intelligence), architecture, education, or evolutionary biology, it has been observed that no studies have been conducted in the field of tourism. Düzeltilmiş metin

In summary, the existing literature focuses primarily on classical artworks or abstract visuals, consisting of neuroaesthetic applications in the fields of architecture, education, and artificial intelligence. This study fills this gap by introducing the neuroaesthetic approach to the discipline of tourism for the first time, addressing it within a unique context. It systematically examines the awareness of thematic hotel visuals for the first time within a framework that integrates environmental content, visual attention, and neuroscience-based methods; it reveals how environmental messages are perceived differently between genders through eye-tracking-based objective measurements.

3. Methodology

This study aimed to determine the aesthetic impact of hotel images with distinctive themes and prominent architectural features on consumers. For this purpose, images of eight hotels operating in Antalya were analyzed using eye-tracking. The research was conducted at the Fırat University Marketing and Neuromarketing Research Center (FÜPNAM) with 30 volunteer participants, consisting of 15 women and 15 men, who had diverse demographic characteristics such as age, gender, occupation, and income level. Participants were selected voluntarily using a convenience non-probability sampling method. They were between 18 and 65 years old, had at least one prior holiday experience, and included students, academics, self-employed individuals, and civil servants.

Before the study, each participant was provided with the necessary information about the research, asked to complete an informed consent form, and declare their voluntary participation. To inform the volunteers, they were also briefed on the points they should pay attention to during the eye-tracking recording. Prior to the start of the research, ethical approval was obtained from the Fırat University Social and Human Sciences Research Ethics Committee (deci-

sion number 2026/1-6 dated 07.01.2026). Within this framework, the proposed methodology consists of the following stages: examining the official websites of thematic hotels and various travel websites; evaluating the images with the help of relevant experts based on objective criteria such as theme, perceived beauty, and resolution; selecting the images that meet the defined criteria; preparing the selected hotel images for eye-tracking analysis; designing and adapting the images for the experiment; conducting the experiment and processing the data. Figure 1 presents all stages of the proposed methodological framework.

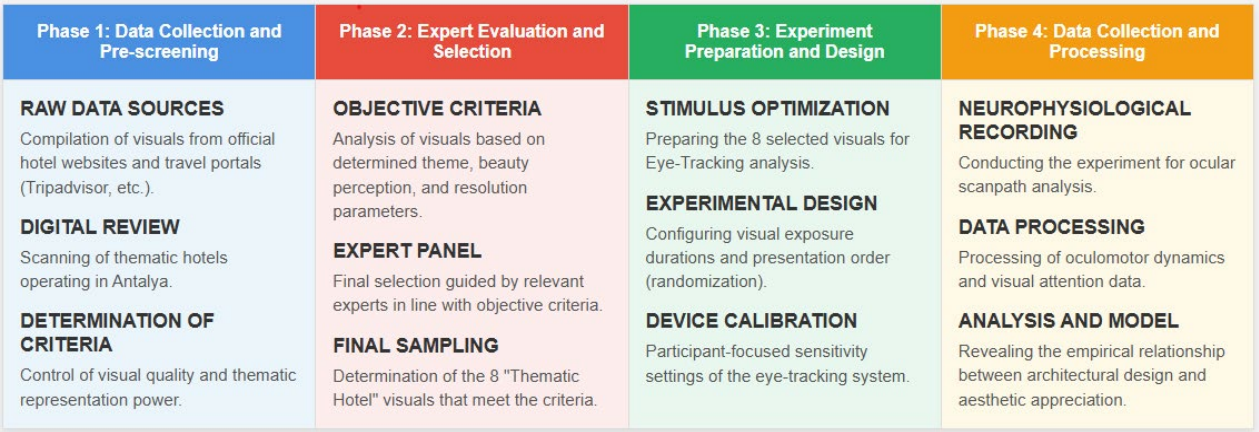

Figure 1. Proposed Methodology

Phase 1: Data Collection and Pre-Screening

In the first phase of the study, hotels operating in the Antalya destination and reflecting a specific architectural theme (historical, cultural) were screened. In parallel with the visual semantic analysis method highlighted by Hu (2025) in the literature, the official websites of the hotels and travel portals with high user interaction (Tripadvisor, Etstur, TatilBudur, etc.) were used as the primary data source. When creating the raw dataset, care was taken to include not only the physical characteristics of the architectural structures but also the aesthetic elements (color harmony, conceptual integrity) expressed by Osaka (2022). Technical standards (resolution, homogeneous light distribution, and perspective accuracy) were used as exclusion criteria during the screening process.

Phase 2: Expert Evaluation and Selection

To ensure the internal validity and representational adequacy of the thematic hotel visuals, a multistage screening procedure was conducted by an expert panel consisting of academics specializing in architectural design, tourism marketing and visual arts. During the image selection process, criteria based on subjective aesthetic preferences and formal and spatial parameters empirically demonstrated in the neuro-architectural literature to directly influence visual attention and aesthetic judgment were considered. Accordingly, the experts rated the images based on an objective set of criteria, including spatial contour and curvature (Vartanian et al., 2013), visual complexity and order (Berlyne, 1971), symmetry and balance, and thematic prototypicality. This rigorous filtering process was implemented to minimize potential biases in eye-tracking data and isolate the neural underpinnings of the aesthetic experience. In line with this procedure, eight visuals representing the thematic architectural diversity were selected from hotels operating in Antalya. Information regarding the selected hotels is provided below.

1. Swandor Topkapı & Kremlin Palace, with their structures reflecting the architectural features of the historical palaces from which they take their names, are among the most distinctive thematic hotels in Antalya. These facilities adapt the symbolic elements of Ottoman and Russian palace architecture to the tourism structure.
2. Concorde De Luxe Resort, with its architecture inspired by the Concorde aircraft from which it takes its name, attracts attention; the exterior form and interior design of the hotel reflect the aviation theme.
3. Orange County Resort Hotel (Kemer), designed inspired by Amsterdam, the capital of the Netherlands. With its facade arrangement resembling canal houses and colorful architecture, it brings the European city texture to the Mediterranean coast.
4. Siam Elegance Hotel, named after Siam, the former name of Thailand, creates an exotic atmosphere with details characteristic of Far Eastern architecture.
5. Transatlantic Hotel, with its architectural approach inspired by the British monarchy and transatlantic ships from which it takes its name, is among the thematic hotels.
6. Titanic Mardan Palace has a neo-classical, monumental palace resort design inspired by Ottoman palace architecture and the iconic stru-

ctures of Istanbul. Its architecture incorporates elements of Venetian (Italy) architecture, including the Maiden's Tower in Istanbul. It brings together a multicultural and magnificent design concept.

7. Titanic Deluxe Lara has architectural details that refer to the legendary Titanic ship from which it takes its name, and stands out with its design that evokes the form of the ship.
8. The architectural theme of the Ducale Lara (Venezia Palace Deluxe Resort) hotel is based on the city architecture and urban palace texture of Venice.

Phase 3: Experiment Preparation and Design

The 8 selected visuals were adapted to the Eye Tracking method. During the experimental design phase, a slide with a "+" sign in the upper left corner was added to a white sheet of paper between the visuals to minimize cognitive load and visual fatigue for the participants. The transition time between each visual was set to 5 seconds; the transitions between them were arranged as 3 seconds. Before data collection, the appropriate distance (65cm) between the participant and the computer was determined, and the necessary calibration process was performed.

Phase 4: Data Collection and Processing

During the experimental procedure, participants' immediate responses to thematic hotel visuals were recorded using a high-frequency (60 Hz) eye-tracking system. The study was conducted following a systematic four-phase workflow to ensure stimulus validity and reliability of data collection.

Stimulus Selection: Architecturally prominent hotels in Antalya were identified, and images were screened based on formal and thematic criteria.

AOI Definition: Critical architectural elements were defined as Areas of Interest (AOIs) according to the following criteria:

- Façade details and structural forms can influence visual attention and aesthetic perception.
- Thematic symbols and decorative elements that are easily recognizable and prototypical of the hotel's theme.
- The entrance and reception areas serve as focal points in the user experience.
- Spatially distinct AOIs preserve visual integrity and prevent overlap.

Eye-Tracking Data Collection: Participants viewed the selected visuals while their gaze data were recorded.

Data Analysis: AOI-based eye-tracking data were analyzed using heat maps and gaze plots:

- Heat maps: Visually represent the areas receiving the most attention.
- Gaze plots: Capture fixation sequence, duration, and direction, revealing detailed visual attention patterns.
- Objective metrics, including average fixation duration, fixation count, and time to first fixation, were extracted for each AOI.

This approach ensured reliable data collection, enabled precise analysis of visual attention, and provided a clear framework for examining the neuroaesthetic underpinnings of aesthetic experience in thematic hotel architecture.

3.1. Data Analysis

This study utilized eye-tracking, a neuromarketing research method. Widely used in biometric measurements, eye-tracking records where and for how long a participant looks by monitoring their eye movements. This allows researchers to determine whether a marketing stimulus has captured the participant's attention and whether they are interested in it. In this method, pupil movements and the degree of pupil dilation and constriction are recorded using infrared light at a speed of at least 60 Hz (Raney et al., 2014). Eye-tracking provides data such as the point the participant first looks at, the areas they focus on, and the duration of their gaze.

Gaze maps provide researchers with information about the order, duration, and frequency of a consumer's gaze towards stimuli, while heat maps help determine which areas consumers focus on most and whether they look at different areas. In eye-tracking techniques, participants' eye movements are monitored to analyze how they interpret stimuli, their gaze distributions, and durations. These analyses allow researchers to observe how the participant's attention and cognitive processes are affected. Furthermore, eye-tracking techniques include two types of eye movements: saccadic and fixation. According to the theory supporting eye-tracking, pupil dilation and longer blinking intervals indicate that the individual is processing information more effectively (Sebastian, 2014).

The research was conducted with 30 volunteer participants within the scope of the Firat University Marketing and Neuromarketing Research Center (FÜPNAM). Experimental studies (e.g., research using EEG analysis methods) show that groups of 30–40 people constitute the most suitable and consistent sample size with a margin of error of less than 1% (Sands, 2009). Participants were selected on a voluntary basis, and each participant was given the necessary information about the research before the study. In order to inform the volunteer participants, the points they should pay attention to during the experiment were explained to them. After the study was completed, the data obtained were retrieved and interpreted through the licensed Tobii Pro Lab program. Tobii Pro Lab is a licensed software that operates the eye-tracking device and records the data. The aim was to determine the heat map data

of 8 selected hotel images using the eye-tracking method. In this context, heat maps quickly show the data distribution on an image observed during the experiment; traditionally, they are visualized by covering the background image with translucent colors. In such visualizations, the most intensely observed areas are usually highlighted in red, while unobserved areas are shown in blue or black tones (Špakov and Miniotas, 2007).

4. Findings

The findings of the proposed model in this section are first explained by interpreting the heat map images of 30 participants. Then, the visuals of the study, which was conducted with 15 women and 15 men, are reported under male-female headings to reveal the differences according to gender.

4.1. Results of All Participants

4.1.1. Swandor Topkapı & Kremlin Palace

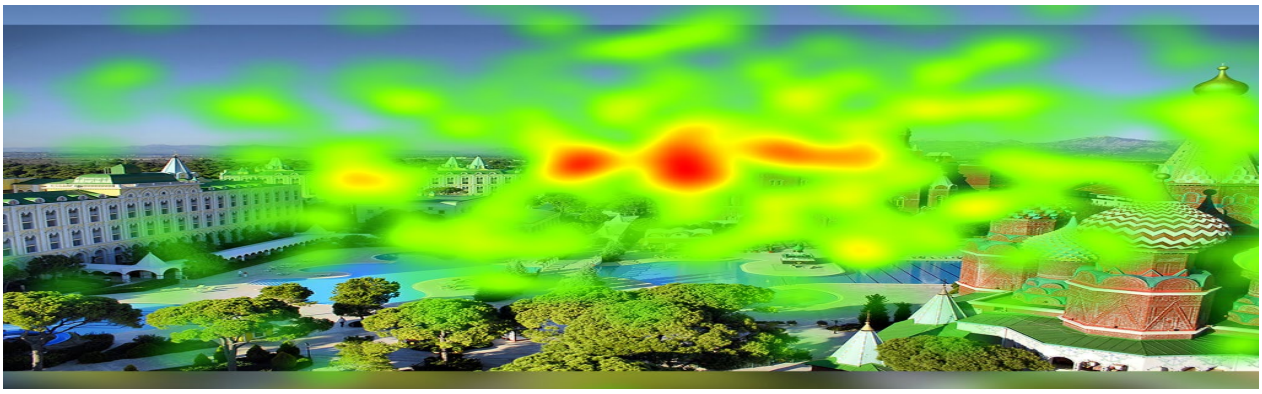

Figure 2. Heat Map of Swandor Topkapı & Kremlin Palace Hotel

An examination of the collective heat map revealed that participants' visual attention was primarily focused on the central palace block, tower structures, and domed architectural elements. As these features activate selective attention systems, this focus enables cognitive resources to be predominantly allocated to these areas. The main mass and iconic tower forms of the hotel, reminiscent of the Kremlin in Moscow—symbols of power, prestige, and authority—were perceived as meaning-laden symbols rather than mere aesthetic objects. This indicates that the participants did not code the structure as an ordinary accommodation but as a strong and iconic architectural entity. From a neuroaesthetic perspective, the architectural forms highlighted by the heat map serve as powerful stimuli that elicit emotional responses. The towering structures and majestic façades trigger positive emotions, such as awe and respect, deepening the emotional dimension of the aesthetic experience. In contrast, pool areas and landscape elements remained secondary areas of attention.

4.1.2. Concorde de Luxe Resort

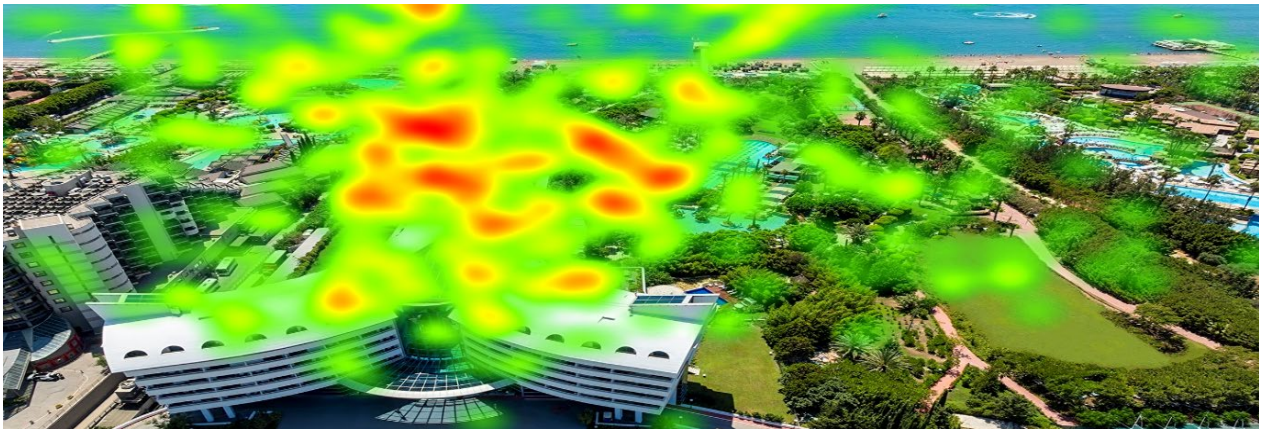

Figure 3. Heat Map of Concorde de Luxe Resort Hotel

An examination of the collective heat map revealed that the participants' visual attention was primarily focused on the hotel's main architectural mass, the central building block, and the structure's silhouette. These structural elements activate selective attention systems, ensuring the predominant allocation of cognitive resources to this area. The most intense areas of focus on the heat map were located at the center of the building's modern and tiered form, rather than on recreational details such as the hotel's pool or landscape. This indicates that participants encoded the structure not merely as a functional accommodation unit, but as a holistic aesthetic form. The building's wide, curved, and monumental stance creates a strong visual impact on the viewer, drawing central attention to itself. From a neuroaesthetic perspective, this architectural form highlighted by the heat map served as a powerful stimulus that triggered emotional arousal. The structure's modern lines and magnitude deepen the dimensions of the aesthetic experience by triggering perceptions of grandeur and modernity. In contrast, the extensive landscape areas, greenery, and pool sections surrounding the visual remained secondary areas of interest that attracted less attention within the visual hierarchy.

4.1.3. Orange County Resort Hotel

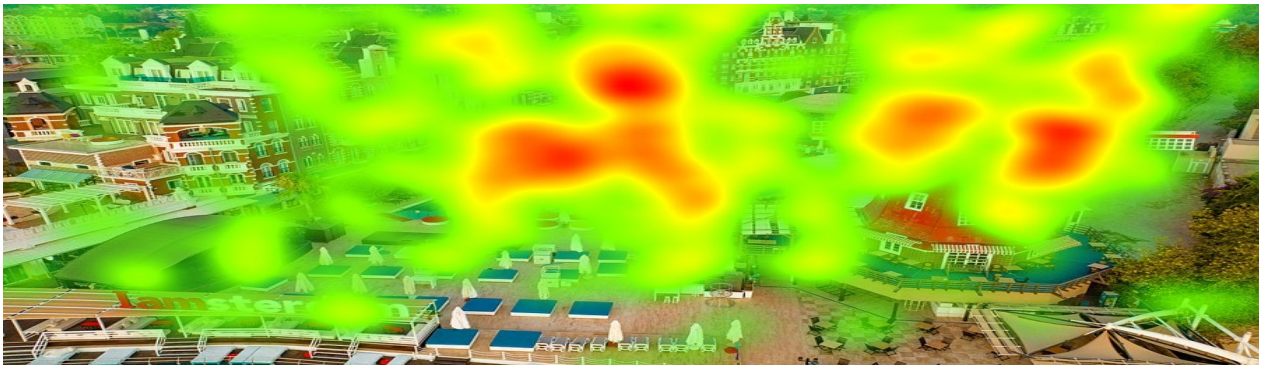

Figure 4. Heat Map of Orange County Resort Hotel

The participants' visual attention was primarily focused on the central building blocks and surrounding tower-like architectural elements. As these features activated selective attention systems, cognitive resources were predominantly directed towards these areas. The main structure of the hotel and the iconic tower forms were perceived as meaning-laden symbols that evoked power, prestige, and authority. This indicates that the participants did not code the building as an ordinary accommodation facility but as a strong and iconic architectural entity. From a neuroaesthetic perspective, the architectural forms highlighted in the heat map functioned as powerful stimuli that elicited emotional responses from the participants. The rising building masses and majestic façades trigger positive emotions such as awe and respect, deepening the emotional dimension of the aesthetic experience. In contrast, landscapes and other open-area elements remained secondary areas of attention.

4.1.4. Siam Elegance Hotel

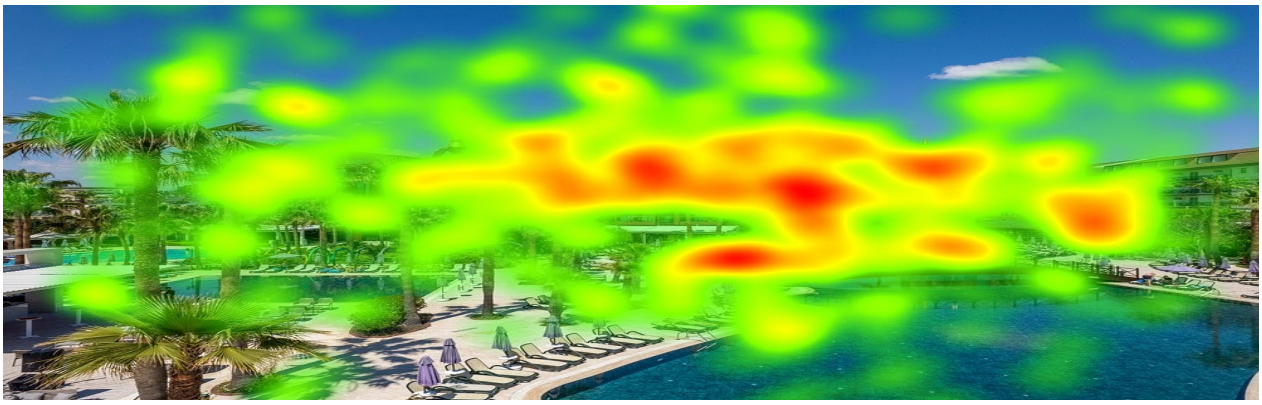

Figure 5. Heat Map of Siam Elegance Hotel

An examination of the collective heat map revealed that participants' visual attention was primarily focused on the hotel's multi-layered roof forms, pointed and upward-rising roof edges, and facade details reminiscent of wood texture. These architectural elements activate selective attention systems, directing cognitive resources predominantly to these areas. The thematic architecture of the Siam Elegance Hotel was perceived as meaning-laden symbols evoking a sense of belonging to a culturally "distant" and exotic geography. Participants did not code the space as an ordinary holiday hotel but as an iconic structure offering a rich and distinctive cultural experience. From a neuroaesthetic perspective, the architectural forms highlighted in the heat map facilitated stronger encoding of the visual image through emotional associations and extended attention duration, deepening the cognitive and emotional dimensions of aesthetic experience. In contrast, the surrounding landscape and open areas remained secondary attention zones.

4.1.5. Transatlantik Otel

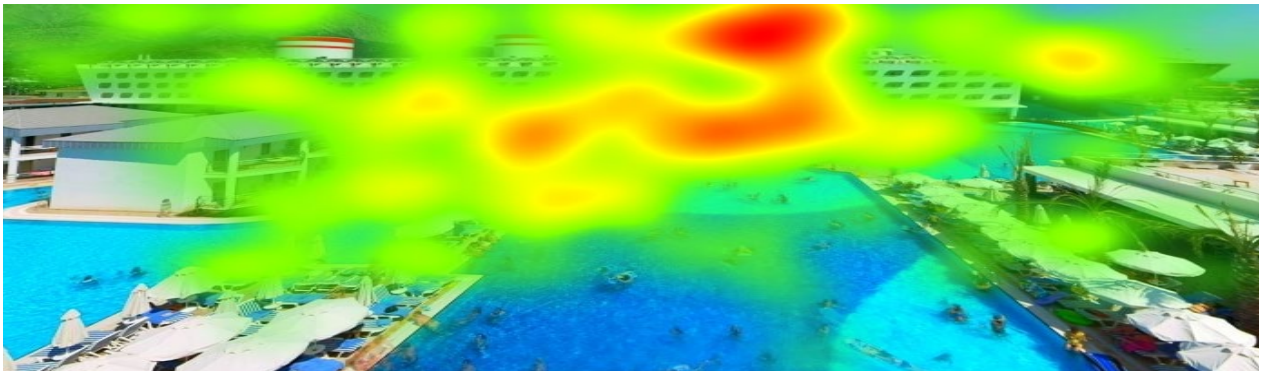

Figure 6. Heat Map of Translantik Hotel

An examination of the collective heat map revealed that participants' visual attention was primarily focused on the hotel's iconic "ship" silhouette, the upper deck layers, and particularly the vertical structural elements resembling funnels. It was determined that the hottest zones on the heat map were clustered on the upper mass that constitutes the cruise ship's identity, rather than on the extensive pool area in the foreground. This focus demonstrated that the hotel's architectural design created a strong metaphorical perception for the viewer. Participants encoded the structure not as a static accommodation building, but as a dynamic image of a marine vessel. From a neuroaesthetic perspective, this colossal ship form presented in a terrestrial context creates perceptual contextual novelty, triggering selective attention mechanisms. The ship metaphor increases the emotional depth of the aesthetic experience by activating semantic associations such as luxury, travel, and adventure. Meanwhile, the extensive pool and recreation areas covering the foreground of the visual were evaluated as complementary environmental elements supporting the main figure by creating a "virtual sea" context in which the ship floats, remaining as a secondary focal point in the visual hierarchy.

4.1.6. Titanic Mardan Palace

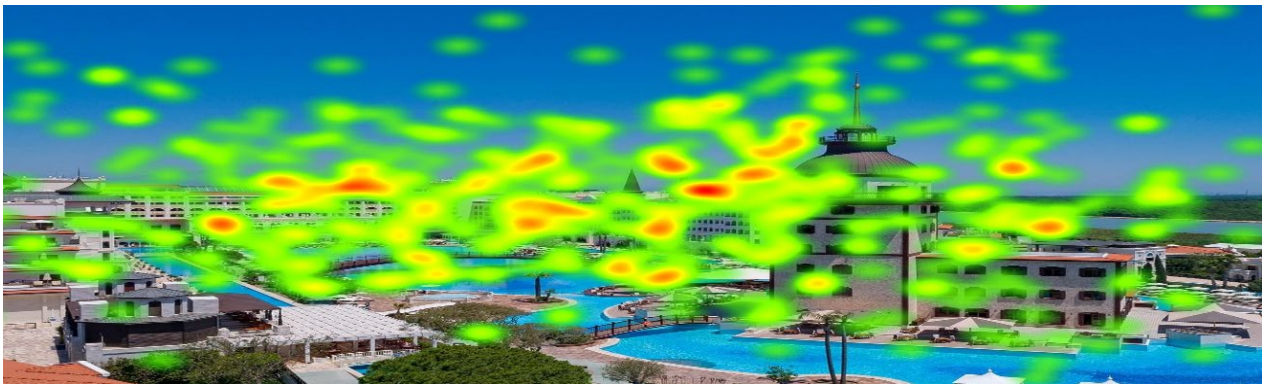

Figure 7. Heat Map of Titanik Mardan Hotel

An examination of the collective heat map determined that participants' visual attention was focused on the iconic tower structure dominating the spatial composition, its conical roof termination, and the vertical architectural axes of the main building. The hottest zones on the heat map were clustered on these vertical monumental forms with strong historical references rather than on the expansive pool surface in the foreground. This focus demonstrated that the hotel's architectural design created a strong historical and cultural association with the viewer. Participants encoded the structure not as a modern resort hotel, but as a historical monument or urban landmark. From a neuroaesthetic perspective, this prominent tower extending toward the sky, in contrast to the pool on the horizontal plane, created a strong contrast within the visual scene, thereby attracting selective attention mechanisms. The tower and palace metaphors strengthen the semantic dimension of the aesthetic experience by activating semantic layers such as grandeur, nobility, and cultural memory. Meanwhile, the extensive water features and landscaping covering the lower half of the visual were perceived as a backdrop framing and highlighting this monumental structure, remaining a secondary area of interest in the visual hierarchy.

4.1.7.Titanic Deluxe Lara

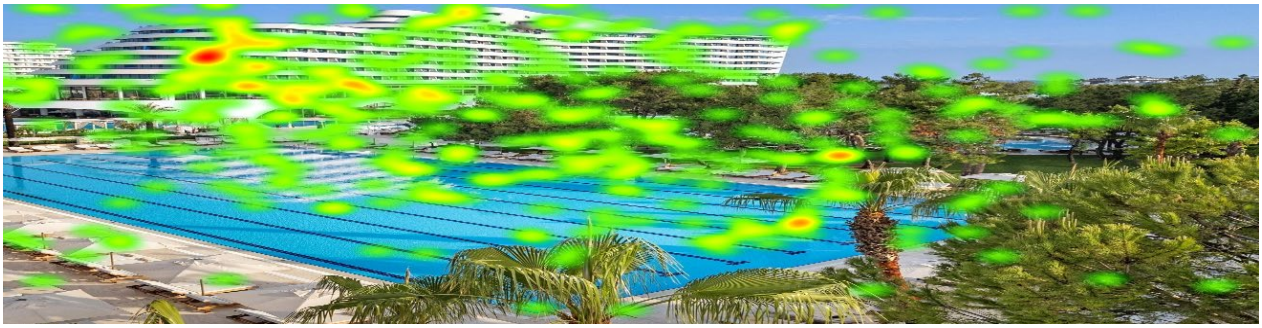

Figure 8. Heat Map of Titanik Deluxe Lara Hotel

When the aggregated heat map was examined, it was observed that participants' visual attention was primarily focused on the hotel's stepped (terraced) façade composition, rhythmic window arrangements, and the upper mass form of the building. The areas of highest concentration on the heat map were found to rise from the linear contours of the foreground pool toward the upper-left block of the building. This focus indicates that the repetitive geometric patterns and horizontal continuity in the hotel's architectural design create a strong visual flow for viewers. Participants followed the perspective lines generated by the pool, locking their gaze onto the main building and coding it as a visual dominant destination. From a neuroaesthetic perspective, regular and rhythmic repetitions on the façade enhance the brain's processing fluency, thereby facilitating aesthetic pleasure. The building's modern and spacious appearance activated semantic associations such as order, comfort, and tranquility, which positively influenced the aesthetic experience. The pool lanes in the foreground functioned as guiding lines directing attention toward the building but remained a complementary element in the visual hierarchy compared to the dominant main structure.

4.1.8. Ducale Lara (Venezia Palace Deluxe Resort)

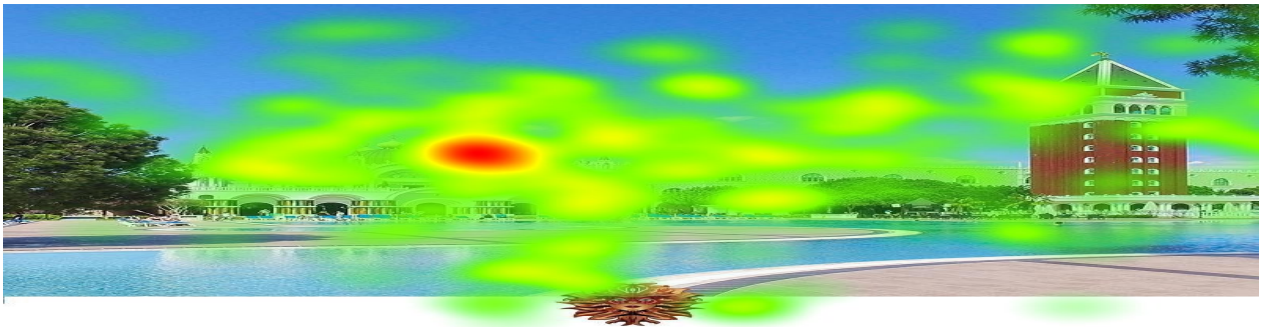

Figure 9. Heat Map of Ducale Lara Hotel

It was observed that participants' visual attention rapidly scanned the massive water body in the foreground and focused on the center of the main architectural mass in the background, the arched façade details, and the vertical block (tower) structure standing as a balancing element on the right. It was determined that the hottest zone on the heat map was clustered in the middle-left section, where the architectural details of the structure were most dense, while the wide surface of the pool remained a "cold" zone. This focusing strategy demonstrated that the viewer acted with an "information seeking" impulse while scanning the visual. From a neuroaesthetic perspective, the low-frequency (flat/sparse detail) pool area in the foreground was processed by the visual system as a "transition zone" or negative space; attention was directed toward the detailed/complex architectural façade. Participants did not encode this as a mere hotel view, but as a monumental whole situated on the horizon line. The expansion of architectural elements on the horizontal plane triggers perceptions of "infinity" and "grandeur" in the viewer, ensuring the integration of the aesthetic experience with a sense of spatial vastness. The slight focus on the logo at the bottom center indicates that brand identity was involved in the visual scanning process at a secondary level.

4.2. Results Based on Gender (The Differences Between Women and Men)

4.2.1. Swandor Topkapı Palace & Kremlin Palace (women and men)

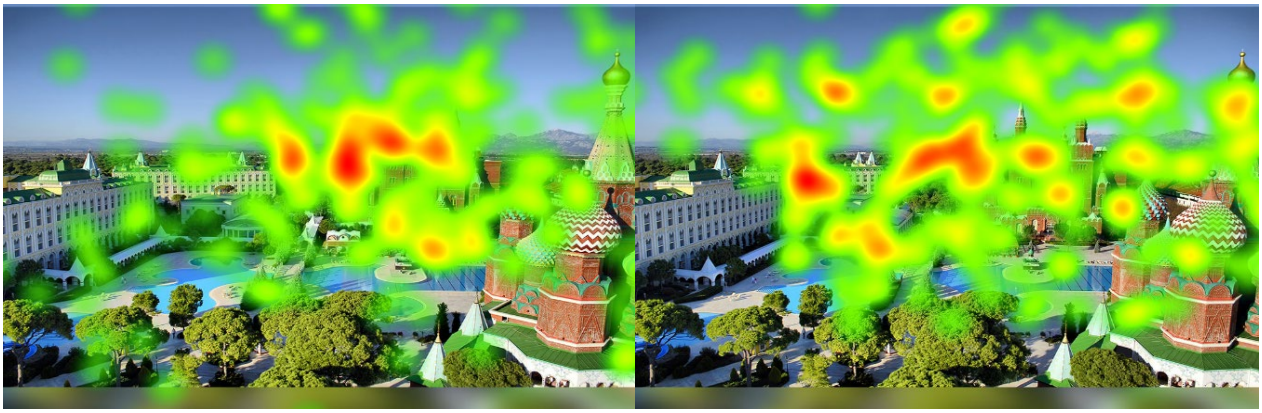

Figure 10. Gender-Based Heat Map Analysis of Swandor Topkapı & Kremlin Palace Hotel

The heat map of female participants showed that attention distribution was more widespread and heterogeneous compared to the male group. It was observed that the gaze of female participants was concentrated not only on the central architectural structure but also on dome patterns, colored surfaces, surrounding landscape, and open space compositions. The attention of male participants, on the other hand, was largely focused on the central building mass, towers, and vertical architectural elements. The height, symmetry, and monumental scale of the structures, in particular, caused male participants to fixate on these areas for longer periods. While men focused their attention more on the central structure, towers, and symmetrical and monumental architectural elements, women showed a broader distribution of attention to architectural details, colored domes, surrounding areas, and visually diverse regions. This difference revealed that thematic hotel architecture does not create a uniform aesthetic effect in consumer perception; rather, it triggers different neuroaesthetic processing modes depending on gender.

4.2.2. Concorde de Luxe Resort (women and men)

Figure 11. Gender-Based Heat Map Analysis of Concorde de Luxe Resort Hotel

While the gaze of female participants was observed to be concentrated on pool areas, water features, green landscaping, and outdoor arrangements; an examination of the heat map of male participants revealed a significant focus on the central building form, the axis of symmetry, and the integrity of the main mass. It was observed that in the male group, gazes were concentrated on more limited and focused areas, while environmental details received relatively less attention. It was seen that the architectural theme of Concorde De Luxe Resort showed

4.2.3. Orange County Resort Hotel (women and men)

Figure 12. Gender-Based Heat Map Analysis of Orange County Resort Hotel

An analysis of the heat map of female participants revealed that their gaze was spread across a wide area, encompassing facade details, colored surfaces, pool areas, outdoor furniture, and social use areas. Male participants, on the other hand, focused more on prominent thematic symbols (particularly the windmill structure) and the regular sections of the facade line. In the male group, despite the visual complexity, gaze was observed to be relatively more selective, converging on specific architectural and thematic focal points. This difference suggests that the thematic and detail-intensive architecture of the Orange County Resort Hotel triggers different attention patterns and neuroaesthetic processing modes based on gender.

4.2.4. Siam Elegance Hotel (women and men)

Figure 13. Gender-Based Heat Map Analysis of Siam Elegance Hotel

It was determined that the attention span of female participants was more widespread and scattered compared to the male group. The gaze of female participants was spread across a wide area encompassing pool areas, water surfaces, palm trees, sun loungers, and the facades of architectural structures. When the heat map of male participants was examined, it was observed that their attention concentration was relatively more limited and selective; particularly concentrated around pool edges, the curved boundaries of the water surface, and the middle-upper sections of architectural structures.

This difference indicates that the exotic and nature-integrated architecture of the Siam Elegance Hotel triggers different neuroaesthetic processing modes depending on gender. While the architectural structure was perceived as part of the spatial arrangement for male participants, it became an emotional and environmental element that complemented the atmosphere for female participants.

4.2.5. Transatlantik Otel (women and men)

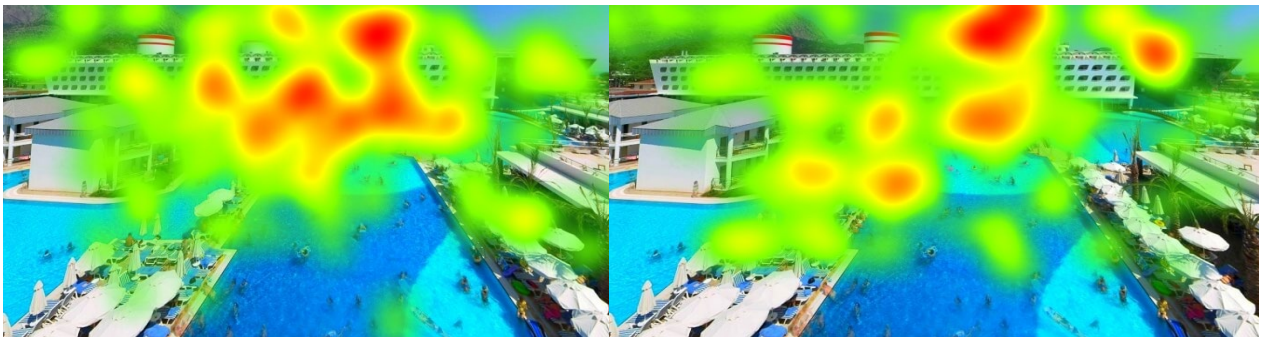

Figure 14. Gender-Based Heat Map Analysis of Transatlantik Hotel

While the gaze of female participants was observed to be spread across a wider area encompassing pool areas, water surfaces, sun lounger arrangements, and surrounding spaces, the attention of male participants was more focused on the central part of the pool, the movement on the water surface, and the central axis of the building's facade. In the male group, the gaze was relatively more focused and concentrated on limited areas, and less spread to surrounding details. This reveals that the nautical-themed and water-focused architecture of the Transatlantic Hotel exhibits differences based on gender.

4.2.6. Titanic Mardan Palace (women and men)

Figure 15. Gender-Based Heat Map Analysis of Titanic Mardan Palace Hotel

The heat map of female participants shows a more widespread and heterogeneous distribution of attention compared to the male group. It was observed that the gaze of female participants spread across a wider area, encompassing pool areas, bridges, open spaces, and environmental details in addition to the central tower. In the heat map of male participants, the concentration of attention was largely focused on the central tower, the linear axes formed by the bridges, and the main building masses. In the male group, gaze was found to be more central, focused, and concentrated around specific architectural elements. These findings reveal differences in the monumental and palatial architecture of the Titanic Mardan Palace based on gender.

4.2.7. Titanic Deluxe Lara (women and men)

Figure 16. Gender-Based Heat Map Analysis of Titanic Deluxe Lara Hotel

The attention distribution of female participants was more widespread and heterogeneous than that of the male group, with their gaze extending across a broad area, including the building façade, pool areas, palm trees, and landscape elements. In contrast, male participants concentrated their attention more on the upper sections of the building, the façade line evoking a ship form, and specific focal points within the pool area. In the male group, gaze patterns were relatively more focused and building-centered, while attention to environmental details remained limited.

4.2.8. Ducale Lara (Venezia Palace Deluxe Resort) (women and men)

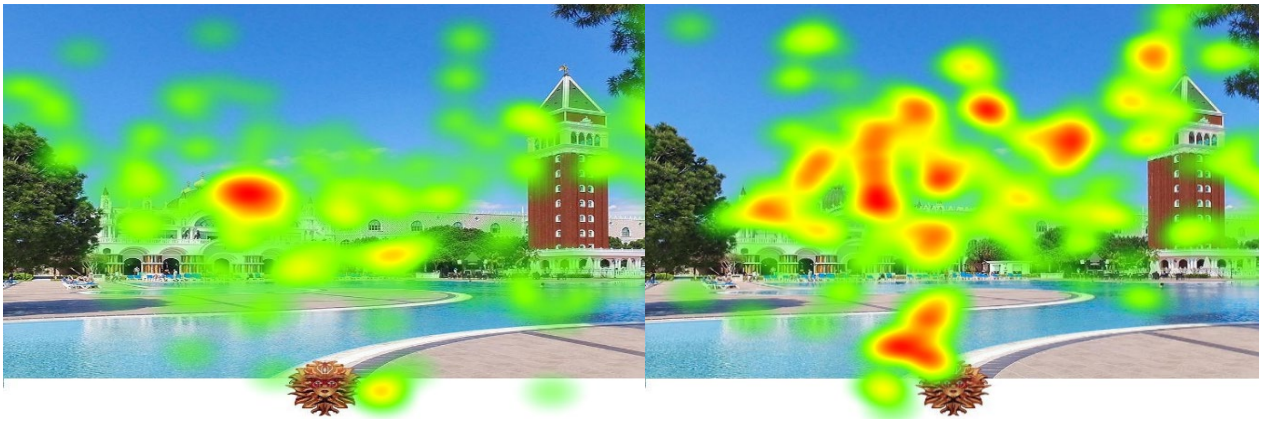

Figure 17. Gender-Based Heat Map Analysis of Deluxe Lara Hotel

An analysis of the heat maps revealed that female participants exhibited a more widespread and multi-focused distribution of visual attention. Their gaze dynamically shifted among façade details, arched openings, water surfaces, reflections, and open-space configurations. In contrast, male participants demonstrated a more centralized and concentrated attention pattern, predominantly focusing on the tower form, symmetrical façades, overall architectural integrity, and scale perceptions. When the heat maps of female and male participants were comparatively evaluated, it became evident that men primarily directed their attention toward towers, symmetry, and the monumentality of the architectural composition, whereas women distributed their visual attention more broadly across façade details, water elements, color variations, and the overall spatial atmosphere. These findings suggest that Venetian-themed architecture does not generate a uniform aesthetic response; rather, it activates distinct neuroaesthetic processing pathways that vary by gender.

5. Conclusions and Discussion

The concept of neuroaesthetics was introduced to the literature by Semir Zeki to define the study of the neural foundations of beauty perception within the context of art. Zeki's approach to art is closely related to his definition of the functioning of the visual brain, which aims to reach accurate information about the world by searching for the constants (unchanging characteristics) of objects, situations, and similar phenomena. In this process, the brain (just like an artist) has to filter out irrelevant information in the visual world in order to permanently represent the true quality of an object. Thanks to this selective process, the brain is able to preserve and categorize unchanging information in a constantly changing world (Gallese & Di, 2012).

In this context, neuroaesthetics is defined as a scientific field that examines the neural basis of taste and aesthetic experiences arising in connection with the production and evaluation of works of art (Chatterjee, 2011, 2013; Nalbantian, 2008; Shimamura and Palmer, 2012; Zeki, 2009). In this field, cognitive neuroscience provides a fundamental framework and forms the theoretical and methodological infrastructure of neuroaesthetic research (Chatterjee and Vartanian, 2014). The literature suggests that neuroaesthetics should be addressed in two main directions. The first is the cognitive neuroscience of aesthetic experience, and the second is the cognitive neuroscience of art (Pearce et al., 2016). Skov and Nadal (2020a) state that recent studies address the relationship between neuroaesthetics and art research with the assumption that these two fields are inseparable at their core; This, however, pushes into the background the aesthetic appreciation and sensory evaluation of non-artistic objects, which was among the early goals of neuroaesthetics (Pearce et al., 2016; Skov et al., 2017; Zeki, 1999).

It is stated that in daily life, the behavioral and decision-making processes of living organisms are influenced by the aesthetic evaluation of environmental elements (Brielmann and Pelli, 2018). This shows that aesthetic experience is not limited only to the context of art. While aesthetics is defined as a process that results in hedonic, expressive, or cognitive psychological and behavioral responses as a result of an organism's interaction with its environment,

neuroaesthetics is considered an interdisciplinary research field that examines the neural basis of different types of behavioral, emotional, and cognitive responses using neuroscientific methods.

Neuroaesthetic studies offer neurological explanations for responses to aesthetically pleasing stimuli such as objects, people, and spaces. According to these studies, although what is perceived as aesthetic may vary from person to person, the brain region activated when encountering an aesthetic stimulus is the same. This region is also associated with reward and pleasure, and the desire to possess something aesthetically pleasing is actually linked to the desire to reward oneself. The more aesthetically pleasing a stimulus is—whether visual or auditory—the greater the activation in the brain. In other words, something more aesthetically pleasing translates to a greater reward. Conversely, when faced with an aesthetically unpleasant stimulus, the amygdala, associated with anger and fear, is activated (Zeki, 1993, 1999). These findings are also important from a design perspective; brain imaging studies using fMRI techniques show activation in the medial orbitofrontal cortex of users who purchase aesthetically packaged products, regardless of brand awareness (Reimann et al., 2010).

5.1. Theoretical Implications

In this study, eight hotel images operating in Antalya were examined using an innovative methodology with a neuroaesthetic approach and eye-tracking technique to determine the aesthetic impact of architecturally diverse thematic hotel designs on consumers. This study offers a multifaceted and interdisciplinary contribution to the neuroaesthetics literature within the context of architecture and tourism. It empirically demonstrates that aesthetic experience cannot be considered solely through artistic objects or abstract visual stimuli; similar neuroaesthetic processing mechanisms are effectively employed in experiential and functional spaces such as thematic architecture. In this respect, the study expands the scope of neuroaesthetics research beyond visual arts-centered approaches, theoretically broadening the role of architectural environments in aesthetic perception.

A review of the literature revealed that the data obtained strongly paralleled current theories in the neuroaesthetics literature, and it was determined that architectural perception is shaped not only by formal characteristics but also by the viewer's cognitive and emotional processes.

Firstly, the centralization of attention on the architectural mass in hotels with strong iconic forms such as the Kremlin Palace and Concorde De Luxe supported the view emphasized by Atiyeh (2025) that aesthetic judgment arises from the interaction of "emotion-evaluation" and "meaning-knowledge" processes. Participants coded these structures not only as geometric forms but also through powerful symbols they already knew (palace, airplane). This situation aligns with the thesis of Reber et al. (2004) and Falgero (2021), which states that the modern mind uses "top-down" conceptual control mechanisms when processing visual data.

Secondly, the study's finding regarding the relationship between "architectural object" and "landscape/context" confirms Lin et al. (2024)'s work, which suggests that aesthetic experience is not limited to an object, but that visuals such as pools and landscapes shape perception. The perception of architecture integrated with water and landscape, particularly seen in the Transatlantic and Siam Elegance hotels, is explained by neuroaesthetic emphasis by Wang et al. (2024) and Jacques (2021), arguing that landscape and environmental elements trigger an internal aesthetic experience in the brain. This explains why participants (especially women) focused not only on the building but also on the atmospheric integrity.

A third important finding concerns the effect created by vertical lines (towers, pointed roofs) and fluid forms (ship hulls), with the vertical elements in the findings creating a perception of "power and prestige," directly linked to the work of Gallese and Di Dio (2012). When vertical forms are seen, a feeling of physical elevation or resistance is simulated via mirror neurons; similarly, the fluid lines of the Concorde or the Transatlantic trigger a feeling of "movement." This neurobiological mechanism supports the conclusion that architectural forms evoke not only a visual but also a motor and emotional response in the viewer.

Finally, one of the most striking findings of the study, gender-based attention differences, showed consistency with visual processing strategies in the literature. The fact that male participants' attention was focused on "central, structural, and holistic"; while women's attention was focused on "peripheral, detail-oriented, and relational" supported the dynamic nature of aesthetic experience, which varies according to the viewer's internal characteristics, as in the study by Cheron and Maere (2025). The fact that men gravitated towards iconic and vertical symbols of power; and women towards spatial atmosphere and landscape details, showed that the gender factor is a fundamental variable that alters perceptual distinctiveness maps in architectural neuroaesthetics. In conclusion, this study proved that aesthetic vision can be measured experimentally in the perception of thematic hotel architecture, as stated by Coccagna et al. (2020) and Nadal & Skov (2015), and offered an original methodological contribution to the neuroaesthetics literature based on the neuroscience foundations of visual attention.

The findings demonstrate that thematic hotel archi-

tecture transcends the identity of a "holiday destination" in consumer perception, becoming coded as a powerful semantic and emotional experience. Iconic and thematic architectural elements not only enhance visual attention but also ensure that the space is more permanently embedded in mental representation. However, the systematic elucidation of gender-related attention patterns offers a critical challenge to assumptions that aesthetic perception is a universal and homogeneous process. This finding suggests that neuroaesthetic theories should treat individual differences as a more central variable, and deepens theoretical discussions regarding the subjective dimension of aesthetic experience. In this respect, the study empirically supports, from a neuroaesthetic perspective, the calls in the neuroaesthetic literature for considering aesthetic experience in conjunction with its dimensions of memory, emotion, and meaning.

5.2. Practical Implications

This study, which uses eye-tracking heat maps to analyze responses to thematic hotel architecture, offers valuable and applicable insights for architectural design and tourism marketing. By integrating these results with neuroaesthetics (specifically the relationship between gender, landscape, and monument, and embodied simulation), stakeholders can optimize visual communication and spatial experiences.

The study reveals a significant differentiation in visual attention. Men focus on monumental, vertical, and symmetrical elements (power/prestige), while women exhibit a heterogeneous distribution of gaze encompassing landscapes, pools, and social details. This aligns with the understanding that aesthetic evaluation is influenced by the viewer as much as by the object itself. When preparing advertising visuals, it is necessary to use visuals that appeal to male viewers by emphasizing verticality, central symmetry, and the "iconic" status of the building, appealing to their preference for structural integrity and power. For female viewers, wide-angle shots that integrate the architecture with the landscape context (pools, gardens, social areas) should be used, emphasizing the "atmosphere" and social amenities, leading to a more holistic aesthetic evaluation.

Heat map analyses show that thematic architectural elements play a decisive role in visual attention. It has been found that vertical, monumental, and symmetrical structural elements (towers, central masses, palace forms, etc.) strongly centralize visual attention; conversely, architectures with high detail and theme density spread attention throughout the space. This indicates that different architectural strategies should be adopted in hotel design depending on the desired perception. For iconic and prestige-focused brands: Monumental, symmetrical, and centralized architectural compositions should be preferred. For experience and atmosphere-focused facilities: Richness of detail, thematic symbols, and multi-focused spatial arrangements should be emphasized. Heat maps show that while unique architectural forms (like the Concorde) draw attention to the center, the presence of thematic symbols (windmills) and landscapes (pools) distracts and creates a more "experience-oriented" perception. Aesthetic judgment arises from the interaction of emotion-evaluation and meaning-knowledge processes. By appealing to the "neuroaesthetic appreciation" of landscapes, it allows the space to be perceived not just as a building, but as a livable environment with recreational potential. These findings demonstrate that architects and investors should consider not only aesthetic preferences but also visual attention and perceptual processing dynamics when making design decisions.

5.3. Limitations and Future Research

While the findings of this study offer important and original contributions, the research also has some limitations. Firstly, the study was conducted with 30 participants from different occupational, age, and gender groups in Elazığ province. Repeating similar analyses with larger samples and diverse socio-demographic characteristics in future studies will be important. The study was conducted using static architectural images. However, tourist spaces offer multi-sensory experiences involving movement, sound, light, and user interaction.

Future research using virtual reality (VR), augmented reality (AR), or video-based stimuli will allow for a more comprehensive examination of the temporal and dynamic dimensions of aesthetic perception. Another limitation is that neuroaesthetic measurement is limited to visual attention and heat map data. Further studies supporting the data with additional neurophysiological measurements such as EEG, fNIRS will allow for a more in-depth analysis of the emotional and cognitive dimensions of aesthetic experience. Finally, this study focused on the gender variable. Future research examining the effects of variables such as age, cultural background, travel motivation, income level, and travel experience on aesthetic perception will provide a multidimensional and comparative perspective to the field of tourism neuroaesthetics.

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