



Multidimensional Analysis of Aesthetic, Form, and Perception in Chettinad Residential Architecture

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Abstract: Chettinad residential architecture represents one of the most distinctive vernacular architectural traditions of South India, known for its unique spatial organization, climatic responsiveness, and cultural richness. However, limited research has explored how these houses create aesthetic and spatial experiences through visual perception and architectural composition. This study examines the aesthetic and spatial qualities of Chettinad houses using the frameworks of formal, functional, meaningful, and sustainable beauty. Particular attention is given to silhouette complexity, cone of vision, and the relationship between built mass and fenestration in shaping visual and spatial experiences. A qualitative case study approach was adopted, focusing on Chettinad residences in Kothamangalam, Tamil Nadu. Data were gathered through field observations, photographic documentation, spatial mapping, sequential experiential analysis, and a review of relevant literature. The study evaluates silhouette complexity from selected viewpoints, examines mass-fenestration relationships in relation to climate and aesthetics, and analyzes how spatial perception evolves from the public street to private interior spaces using cone of vision theory. The findings reveal that Chettinad houses successfully combine climatic efficiency, cultural symbolism, and carefully designed spatial experiences through a well-structured sequence of spaces. Based on these findings, the study proposes a five-point planning framework that offers valuable insights for integrating traditional wisdom into contemporary sustainable architectural design.

Index Terms – Thinnai, Mutram, Cone of Vision, Silhouette Complexity, Fenestration, Thermal Mass, Sequential Experience.

I.INTRODUCTION

Vernacular architecture is more than a response to climate or the availability of local materials; it reflects the culture, values, lifestyle, and identity of a community (Rapoport, 2003). In this context, the Chettinad house of Tamil Nadu represents a remarkable architectural tradition developed by the Nattukottai Chettiars between the 18th and early 20th centuries. These houses are widely recognized for their grand street façades, shaded verandahs (thinnai), intricately carved wooden doors, decorative flooring tiles, and open-to-sky courtyards that bring light and air into the interior spaces (Prabhakaran et al., 2024). However, the significance of Chettinad architecture extends far beyond its visual richness. The planning and spatial arrangement of these houses demonstrate a carefully developed architectural logic that skillfully manages light, ventilation, privacy, scale, and movement, creating a unique spatial experience for occupants (Lakshmanan et al., 2023).

This study explores the aesthetic qualities of Chettinad houses through four interconnected dimensions: formal, functional, meaningful, and sustainable beauty. In addition, it examines how silhouette complexity and mass-fenestration relationships contribute to the visual identity of these residences. The study also investigates the role of the cone of vision in shaping how spaces are gradually experienced, beginning from the public street and moving toward the more private interior zones (Lee & Ostwald, 2022). To ensure a systematic and reliable understanding of these spatial and visual characteristics, the research adopts a structured observational methodology based on specific viewing distances and angles, allowing for a detailed and repeatable architectural analysis.

II. METHODOLOGY

This study examines the aesthetic, spatial, and perceptual qualities of traditional Chettinad residential architecture through a multidimensional framework. The analysis focuses on different aspects of architectural experience, including formal beauty, functional beauty, meaningful beauty, sustainability, silhouette complexity, mass-fenestration relationships, and the concept of cone of vision. Together, these dimensions help explain how Chettinad houses create distinctive visual and spatial experiences while responding to climate, culture, and daily life.

The study is guided by four main research questions: (1) How are formal, functional, meaningful, and sustainable forms of beauty expressed in Chettinad houses? (2) In what ways does silhouette complexity shape the visual identity of the Chettinad facade? (3) How do mass-fenestration relationships contribute to both climatic comfort and aesthetic quality? (4) How does the cone of vision influence the gradual spatial experience from the public street to the private interior?

2.1 Case Study Selection

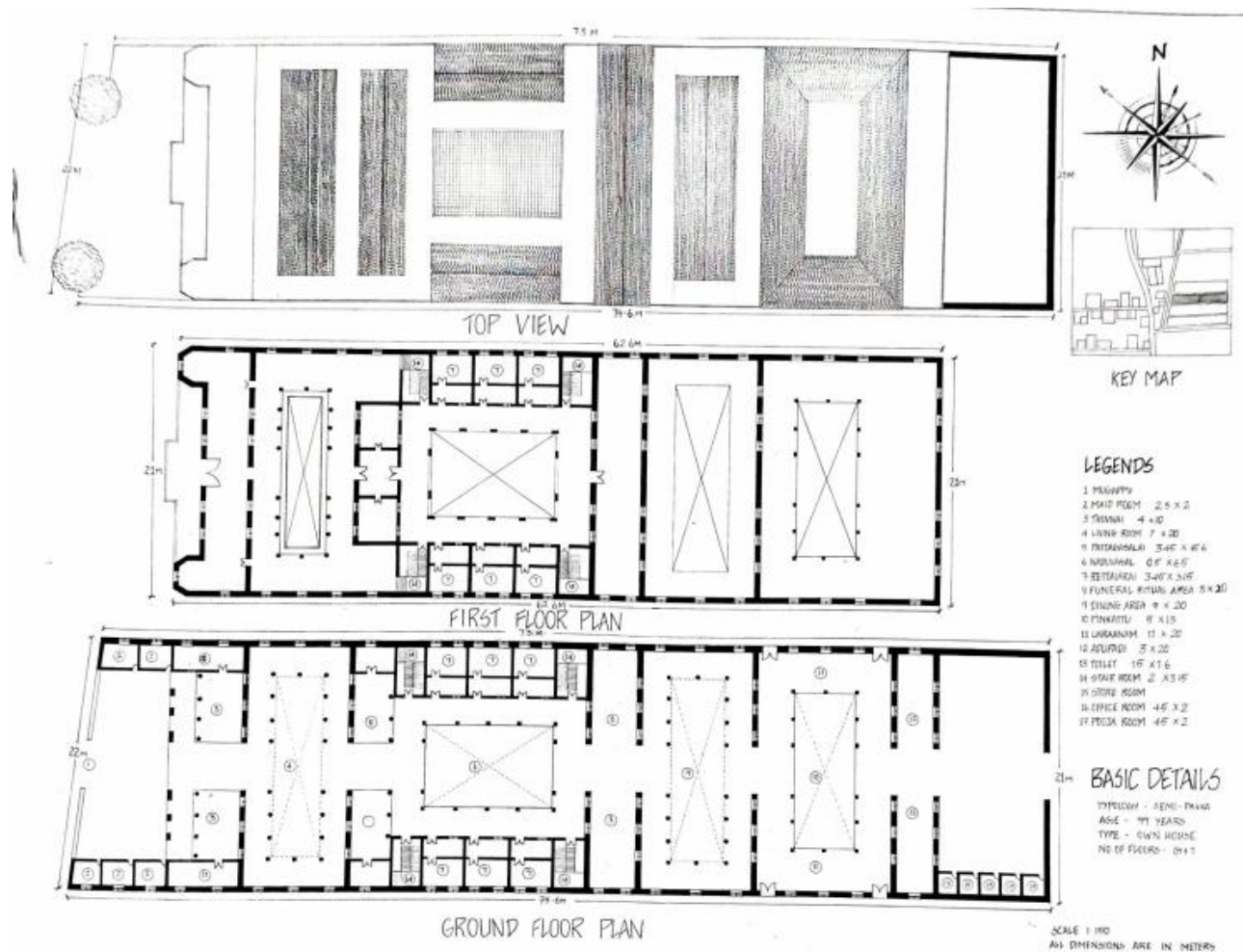
This study uses a qualitative case study approach based on the detailed observation of a single heritage Chettinad house located in Kothamangalam, Sivaganga District, Tamil Nadu. The house was selected based on two important criteria. First, it had to be constructed before 1950 to ensure that the building retained the original features and spatial character of traditional Chettinad architecture. Second, the house needed to be in relatively good condition so that both the interior and exterior spaces could be properly accessed, observed, and documented.

Kothamangalam was selected as the study area during the rural study conducted in the 4th semester of the B.Arch programme. The village was chosen because it continues to preserve the traditional rural character of the Chettinad region and contains several well-maintained heritage houses. Studying architecture in Kothamangalam provided an opportunity to understand how Chettinad houses function within their original cultural, social, and environmental setting. The village still reflects traditional settlement patterns and architectural practices, making it an appropriate context for exploring the spatial, aesthetic, and perceptual qualities of Chettinad residential architecture. The selected house was therefore used as a representative example to better understand the design principles and lived experience embedded in the Chettinad architectural tradition (Harine et al., 2024).

2.2 Data Collection Methods

To develop a comprehensive understanding of the selected Chettinad residence, data were collected using five complementary methods.

First, field observations were conducted from five carefully defined spatial positions within and around the house to understand how architectural features and spatial qualities are perceived from different viewpoints. These observations helped capture the sequential experience of movement through the residence, from public to private spaces.



Second, photographic documentation was carried out at each observation point to record façade composition, material textures, ornamental details, lighting conditions, and the overall quality of spatial enclosure. This visual record supported the detailed interpretation of both exterior and interior architectural elements.

Third, spatial mapping and measured drawings were prepared to document the house plan, courtyard proportions, wall thicknesses, dimensions of openings, and the relationship between enclosed and open spaces. These measurements provided a clearer understanding of spatial organization and architectural proportions.

Fourth, visual analysis techniques were applied to examine silhouette complexity, calculate mass-fenestration relationships, and develop cone of vision diagrams for each observation point. These analyses helped assess how visual composition and spatial perception contribute to the architectural character of the house.

Finally, a systematic review of literature was undertaken to establish a theoretical foundation for the study. Relevant scholarship on vernacular architecture, spatial perception, climate-responsive design, and Chettinad residential architecture was reviewed to support the interpretation and analysis of the case study.

2.3 Analytical Framework

The analysis is organised into various stages based on carefully selected observation points within and around the house. Each position was chosen to understand how the architectural experience changes as one moves through the residence, from public areas to more private spaces.

At every observation point, key aspects of the spatial experience were recorded, including the extent of the visual field (cone of vision), silhouette characteristics, the relationship between built mass and openings (mass-fenestration), quality of light, acoustic atmosphere, and the overall feeling of spatial enclosure. These observations helped in understanding how visual perception and spatial organisation contribute to the architectural character of the house.

The collected findings were then brought together to identify recurring patterns and significant architectural features, providing a deeper understanding of the aesthetic, perceptual, and environmental qualities of traditional Chettinad residential architecture.

III. LITERATURE REVIEW

3.1 Vernacular Architecture Theory

The theoretical foundation of this study begins with the understanding that vernacular architecture is shaped by much more than climate or the availability of materials. According to Rapoport (2003), traditional buildings are deeply influenced by the cultural values, social structures, and symbolic meanings of the communities that create them. He argues that to truly understand the built environment, architectural theory must move beyond monumental or formal architecture and include vernacular traditions, which make up the majority of human settlements across the world.

This perspective is especially relevant to the study of Chettinad houses. Rather than viewing them only as historic or visually impressive structures, this research considers them as examples of architectural knowledge developed over generations. Their spatial planning, construction techniques, and material choices reveal how architecture can embody cultural practices, environmental adaptation, and social identity. Recent scholarship further supports this understanding by emphasizing that vernacular architecture represents accumulated local knowledge developed through practical experience and the use of regional resources. At the same time, such buildings serve as important cultural heritage assets that reflect the lifestyle and identity of a place (Lamzah, 2025).

3.2 Phenomenology of Space and Place

The experience of architecture goes beyond physical form and includes how people emotionally and sensory connect with space. Christian Norberg-Schulz's concept of *genius loci*, or the "spirit of place," provides an important framework for understanding how architecture creates meaning and belonging through the arrangement of space, light, and material (Samalavičius, 2021). According to Norberg-Schulz, architectural experience emerges through the relationship between earth and sky, openness and enclosure, and interior and exterior spaces. These ideas are clearly visible in the spatial sequence of the Chettinad house, where movement progresses from the public street to the semi-public *thinnai*, then into the open courtyard, and finally to enclosed private rooms.

Similarly, Juhani Pallasmaa's phenomenological approach to architecture highlights that buildings are experienced through multiple senses rather than vision alone. He argues that architecture engages emotional, physical, and intellectual responses, with elements such as texture, sound, atmosphere, and light shaping human perception (Tamari, 2017). This perspective is particularly important to the present study, as it informs the analysis of light quality, acoustic conditions, and the changing sense of enclosure experienced while moving through a Chettinad house (Samalavičius, 2021).

3.3 Perception, Visual Analysis, and the Image of Architecture

The way people understand and remember architecture is closely linked to perception. Kevin Lynch's work on urban perception explains that people form a mental image of places through identifiable elements such as paths, edges, nodes, landmarks, and districts (Seamon, 1991). Although originally developed at the urban scale, this idea can also be applied to individual buildings. In this study, Lynch's framework supports the use of defined observation points to understand how the spatial experience of a Chettinad house unfolds gradually through movement and changing viewpoints.

Research on architectural aesthetics has further shown that the visual character of a building is strongly influenced by silhouette and surface complexity. Studies suggest that silhouette complexity plays a major

role in shaping aesthetic preference and often produces consistent visual responses among observers (Stamps, 1999). In addition, facade studies describe visual attractiveness as a combination of complexity and attraction—where one element captures attention and another sustains visual interest over time (Lee & Ostwald, 2022). These qualities are particularly evident in Chettinad facades, where layered compositions, ornamentation, and carefully proportioned openings create a strong visual identity.

3.4 Climate-Responsive Vernacular Architecture

The environmental intelligence of Chettinad architecture has been recognised in recent studies on climate-responsive design. Research on traditional courtyard houses in the region shows that the mutram (central courtyard) plays an important role in improving natural ventilation and daylight, making interiors more comfortable in the hot and dry climate of Tamil Nadu (Prakash & Mahalakshmi, 2017). Thick lime-plastered walls further improve thermal performance by reducing heat gain and maintaining stable indoor temperatures.

Comparative studies between traditional Chettinad houses and modern residential buildings indicate that traditional courtyard planning often performs better in passive cooling and environmental comfort (Prakash & Mahalakshmi, 2017). Broader research on vernacular architecture across India also confirms that features such as courtyards, shaded verandahs, thick walls, and climate-sensitive orientation are common strategies used to create environmentally responsive housing (Singh & Modi, 2025).

3.5 Scholarship on Chettinad Architecture

Existing academic studies have explored Chettinad architecture from cultural, social, and environmental perspectives. Lakshmanan et al. (2023), through fieldwork in multiple Chettinad villages, examined how domestic spatial organisation influences social interactions and gendered experiences, showing that the planning of these houses responds not only to climate but also to social life.

Prabhakaran et al. (2024) studied how traditional Chettinad design features—including natural ventilation, shaded courtyards, thick walls, and Athangudi tile craftsmanship can be adapted into contemporary residential architecture, demonstrating their continued relevance for sustainable design. Similarly, Harine et al. (2024) introduced the idea of “vernacular modernism,” suggesting that traditional Chettinad planning principles can be integrated with modern spatial needs to address present-day sustainability concerns.

3.6 Research Gap

Although previous studies have examined Chettinad architecture from historical, cultural, social, and environmental perspectives, limited research has focused on how these houses are visually and spatially experienced. In particular, there is little systematic study combining silhouette complexity, cone of vision theory, and mass-fenestration relationships to understand the perceptual qualities of Chettinad houses.

Most existing research tends to focus either on material performance and climatic adaptation or on social and cultural interpretations of space, without connecting these aspects to structured visual and spatial analysis. This study addresses that gap by proposing a more integrated and repeatable method for understanding the perceptual and aesthetic qualities of vernacular residential architecture, using the Chettinad house as a representative case.

IV. RESULTS AND DISCUSSION

4.1 Spatial Observation Positions

The analysis in this study is based on a series of carefully selected observation points that help record and understand the spatial and visual experience of the selected Chettinad house in a systematic way. Each position was documented through photographs, sketches, and spatial observations. Cone of vision angles were measured using a protractor and cross-checked with plan drawings to ensure accuracy and consistency in the analysis.

Position 1 - Exterior View

The first observation point was located approximately 12 meters directly in front of the house. At this distance, the entire facade can be comfortably viewed within the observer's field of vision, allowing a clear understanding of the building's overall composition, symmetry, proportions, and architectural character without visual distortion.



Figure 4.1.1

Position 2 - Angled Corner View

The second observation point was positioned at an angle of approximately 30° to 45° from one corner of the house, at a distance of about 8 to 10 meters. This viewpoint helps reveal the three-dimensional quality of the building, including the depth of the thinnai, wall thickness, roof projections, and the play of light and shadow that adds visual richness to the facade.



Figure 4.1.2

Position 3 - Entrance Transition Point

The third position was located about 2 to 3 meters from the main entrance door. From this distance, the entrance becomes the primary focus of attention, making details such as carvings, ornamentation, material textures, and craftsmanship clearly visible. This position also helps understand how the entrance acts as an important threshold between public and private spaces.



Figure 4.1.3

Position 4 - Main Hall

The fourth observation point was located within the main hall, at a distance of approximately 4 to 6 meters from its primary axis. From this position, the proportions of the hall, ceiling height, light quality, and overall spatial scale can be experienced in relation to the human body, helping to understand the sense of enclosure, comfort, and visual balance within the interior space.

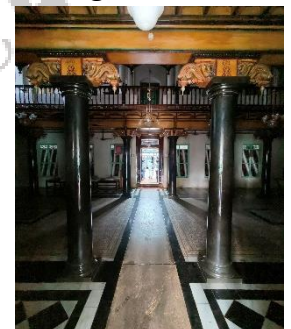


Figure 4.1.4

Position 5 - Courtyard Centre

The fifth observation point was placed at the centre of the courtyard, approximately 3 to 5 meters from the surrounding spaces. This location allows for a complete understanding of the courtyard's spatial organisation, visual openness, and relationship with adjacent rooms. It also provides an opportunity to analyse how light, ventilation, and visual connections contribute to the experience of the central space.



Figure 4.1.5

Position 6 - Backyard Courtyard

The sixth observation point was located in the backyard courtyard, positioned approximately 5 to 7 metres from the central open space. From this position, the spatial relationship between the courtyard, surrounding verandahs, columns, and interior rooms can be clearly perceived. The visual composition emphasizes the openness of the courtyard, the rhythmic arrangement of columns, and the balance between built and open spaces. Natural light entering through the open-to-sky court enhances spatial depth, while the transitional edges around the courtyard contribute to a sense of connectivity, ventilation, and climatic comfort within the residence.



Figure 4.1.6

4.2 Theoretical Framework for Multi-Dimensional Aesthetic Analysis

I. Formal Beauty

The formal beauty of the Chettinad house is most clearly visible in its facade design. The street-facing elevation is usually arranged with strong symmetry, where the main entrance door acts as the central focal point and elements such as columns, windows, and decorative details are balanced on either side. This symmetrical composition creates a sense of order, stability, and permanence, reflecting the social status and cultural identity of the merchant communities who built these homes (Prabhakaran et al., 2024).

The repeated columns along the thinnai (front verandah) add rhythm and depth to the facade, creating a visually pleasing composition. Studies on architectural aesthetics suggest that balance, proportion, and repetition strongly influence how people perceive beauty in buildings (Hasse & Weber, 2012). In Chettinad houses, the relationship between solid walls and openings is carefully controlled. Large entrance doors framed by thick walls create a feeling of strength and permanence, while proportionately placed windows reduce visual heaviness and allow the facade to feel balanced and welcoming (Prieto & Oldenhave, 2021).

II. Functional Beauty

Functional beauty can be understood as the quality that emerges when architectural elements are both useful and visually meaningful. In the Chettinad house, many design features combine practical purpose with architectural elegance.

The mutram (central courtyard) acts as the heart of the house. Open to the sky, it brings natural light and fresh air into the interior, helping maintain comfort in houses that are otherwise enclosed by thick walls and closely built surroundings (Prakash & Mahalakshmi, 2017). Beyond its environmental role, the courtyard also becomes an important social and family space within the house.

Similarly, the thinnai, located at the entrance, serves multiple purposes. It acts as a transitional space between the public street and the private interior, offering a place for social interaction, rest, and informal gatherings. At the same time, it functions as a climatic buffer by reducing direct heat gain and creating a cooler transition into the house (Harine et al., 2024). In this way, beauty in the Chettinad house emerges not only from appearance but also from the intelligent performance of space.

III. Meaningful Beauty

The beauty of the Chettinad house is not limited to its form or function; it also carries deep cultural and symbolic meaning. Architectural elements in these houses are often designed to communicate identity, beliefs, and social values rather than serving merely decorative purposes (Lakshmanan et al., 2023).

For example, the richly carved wooden entrance doors often include motifs of deities, floral patterns, geometric forms, and auspicious symbols. These details reflect ideas of prosperity, spirituality, and craftsmanship while also marking the transition from the public world to the protected domestic space. Ornamentation, therefore, becomes a way of expressing cultural identity and social values.

The famous Athangudi tiles used in Chettinad houses also contribute to this meaningful beauty. Their colourful geometric patterns reflect both local craftsmanship and the influence of global trade networks, particularly connections with Southeast Asia and Europe (Prabhakaran et al., 2024). As Pallasmaa suggests, architecture communicates emotions, memories, and meaning through materials and space, and the Chettinad house demonstrates this through its carefully crafted details and sensory richness (Tamari, 2017).

IV. Sustainable Consideration

Long before sustainability became a major concern in modern architecture, Chettinad houses had already incorporated climate-responsive design principles into their construction. These houses demonstrate how traditional knowledge can create comfortable and environmentally responsive living environments.

The thick lime-plastered brick walls have high thermal mass, helping regulate indoor temperatures by absorbing heat during the day and slowly releasing it at night. This reduces temperature fluctuations and keeps interiors relatively cool in the hot and dry climate of the region (Singh & Modi, 2025).

Shaded spaces such as the thinnai, verandahs, and colonnaded corridors help protect the house from direct sunlight and reduce heat gain. At the same time, the central courtyard encourages natural ventilation by allowing air movement through the house, reducing dependence on mechanical cooling systems (Prakash & Mahalakshmi, 2017).

These climate-responsive strategies, developed through generations of experience and adaptation, reveal a deep understanding of environmental conditions. Today, as architects increasingly search for sustainable design solutions, the Chettinad house offers valuable lessons on how traditional architectural wisdom can inform contemporary practice (Harine et al., 2024).

4.3 Silhouette Complexity

The silhouette of a Chettinad house plays an important role in shaping its visual identity and first impression. When viewed from the street, the outline of the building against the sky creates a strong architectural character. Studies on residential architecture suggest that silhouette complexity the richness and variation in a building's profile strongly influences how visually appealing a building appears, often regardless of materials or decorative details (Stamps, 1999). In the case of the Chettinad house, the silhouette changes depending on the observer's position, creating different visual experiences.

I. Full Frontal Elevation

When viewed from approximately 12 meters directly in front of the house, the entire facade can be seen as a unified architectural composition. From this position, the observer can clearly understand the symmetry and proportions of the building. The sloping tiled roof with projecting eaves forms the upper boundary of the composition, while the thinnai colonnade defines the lower portion of the facade. In houses with an upper floor, windows and openings are arranged in a rhythm that adds visual balance.

The layering of architectural elements such as the plinth, columns, walls, windows, and roof creates a sense of depth and order. Rather than appearing flat, the facade feels visually rich and carefully composed. This balance between simplicity and variation contributes to the strong visual presence of the Chettinad house and supports findings that visual order and complexity are important factors in architectural appreciation (Lee & Ostwald, 2022).

II. Angled Elevation (Corner View)

A different experience emerges when the house is viewed from an angled position, usually between 30° and 45° from one corner and at a distance of about 8–10 meters. From this viewpoint, the three-dimensional character of the building becomes more apparent. The observer begins to notice the depth of the verandah, the projection of the roof, and the thickness of the walls.

This perspective also introduces the effect of light and shadow. Sunlight falling on projecting surfaces while shaded areas recede into darkness creates visual contrast and depth that are not fully visible in the frontal view. The overlapping architectural layers and changing shadows make the silhouette appear more dynamic and visually engaging. Such complexity encourages longer visual attention, reinforcing research that suggests buildings with richer visual profiles tend to create stronger aesthetic interest (Lee & Ostwald, 2022).

4.4 Mass and Fenestration

The relationship between solid walls (mass) and openings such as doors and windows (fenestration) is one of the defining characteristics of the Chettinad house. This balance influences not only the appearance of the building but also its environmental performance and interior comfort.

The walls of traditional Chettinad houses are often thick, ranging between 45 cm and 75 cm. While this thickness supports the structural stability of load-bearing construction, it also improves thermal comfort by reducing heat transfer and creating quieter interior environments (Singh & Modi, 2025). These walls are not experienced merely as boundaries; instead, they create depth and usability. Window ledges become seating spaces, deep openings frame views, and the wall itself becomes an active architectural element.

The size and placement of windows are also carefully designed. Openings are proportioned to admit sufficient daylight and ventilation without weakening the thermal performance of the building. Windows are positioned to spread light deeper into rooms while reducing excessive glare near the floor level. Entrance doors, particularly the main ceremonial doorway, are usually large and prominently designed. Their scale, decorative richness, and placement at the centre of the facade establish a strong visual hierarchy and communicate importance. Research on facade design highlights that the relationship between solid and void, along with rhythm and proportion, plays a major role in shaping architectural beauty (Prieto & Oldenhave, 2021).

4.5 Sequential Movement and Spatial Perception

The Chettinad house is best understood not as a single static object but as a sequence of spaces experienced through movement. The experience of the house unfolds gradually as one moves from public to private areas, with each transition carefully designed to influence perception, atmosphere, and emotion. Architecture, in this sense, is experienced over time through movement and bodily interaction with space (Psarra, 1997).

I. Street to Thinnai

The first transition occurs when moving from the public street toward the thinnai, the raised verandah at the entrance. From the street, the observer views the entire façade within a broad field of vision, understanding the overall scale and composition of the house. As one approaches the plinth and enters the thinnai, noticeable changes begin to occur.

The noisy and open environment of the street gradually shifts into a quieter and more sheltered atmosphere. Thick walls and recessed spaces soften external sounds, while the harsh sunlight outside gives way to cool, filtered shade. The scale of experience also changes—from the openness of the street to the intimacy of the verandah. This transition is carefully designed to prepare the visitor both physically and psychologically before entering the house, making the thinnai an important threshold space (Lakshmanan et al., 2023).

II. Thinnai to Entrance Door

The movement from the thinnai to the entrance door creates a more intimate and detailed architectural experience. From a distance, the main doorway appears large and visually dominant, immediately drawing attention and communicating importance. Its size and proportions are understood in relation to the human body, giving a sense of scale and formality.

As one moves closer, finer details gradually become visible. The carved wooden frame, decorative motifs, and craftsmanship begin to reveal themselves. At close range, intricate carvings of floral patterns, geometric forms, and symbolic elements become clear, allowing the observer to appreciate the material texture and craftsmanship in greater depth.

This gradual shift from distant impression to close observation reflects how people naturally experience architecture. Rather than revealing everything at once, the Chettinad house creates layered visual experiences that unfold through movement, aligning with Pallasmaa's understanding of architecture as a multi sensory and embodied experience (Tamari, 2017).

4.6 Cone of Vision and Spatial Perception in Chettinad Architecture

I. Definition and Basic Principles

The cone of vision refers to the area that can be seen by the human eye from a fixed position. It can be understood as a visual field that spreads outward from the observer toward an object or space. In general, a 30° cone represents the zone of focused vision where details can be seen clearly, while a 60° cone allows a comfortable understanding of spatial relationships and surrounding elements. Although human peripheral vision can extend much further, up to around 120°-180°, the clarity of detail reduces significantly beyond the central field of view.

In architecture, the cone of vision is important because it influences how spaces are perceived and experienced. By controlling what is visible from different positions, architecture can guide movement, create curiosity, and shape emotional responses. Through careful planning of openings, walls, proportions, and spatial sequences, designers can decide what is revealed immediately and what remains hidden, creating spaces that feel intimate, dramatic, open, or enclosed (Psarra, 1997).

II. Cone of Vision at the Entrance to the Courtyard

One of the most powerful spatial experiences in the Chettinad house occurs during the transition from the entrance hall to the courtyard. The entrance passage is usually narrow and enclosed, intentionally limiting the observer's field of vision. This restricted view creates a sense of anticipation, as only a small portion of the interior is visible.

As one moves forward and reaches the courtyard, the experience changes dramatically. The visual field suddenly expands, revealing the open sky, increased daylight, and the full scale of the courtyard. This shift from a confined passage to an open central space creates a strong sense of surprise and openness.

The transition produces several important experiential effects. First, there is a feeling of visual release caused by the sudden expansion of space. Second, the contrast between the darker enclosed passage and the bright courtyard creates spatial drama. Finally, the change in light quality—from shaded interiors to natural daylight—enhances the sensory experience of entering the heart of the house (Psarra, 1997).

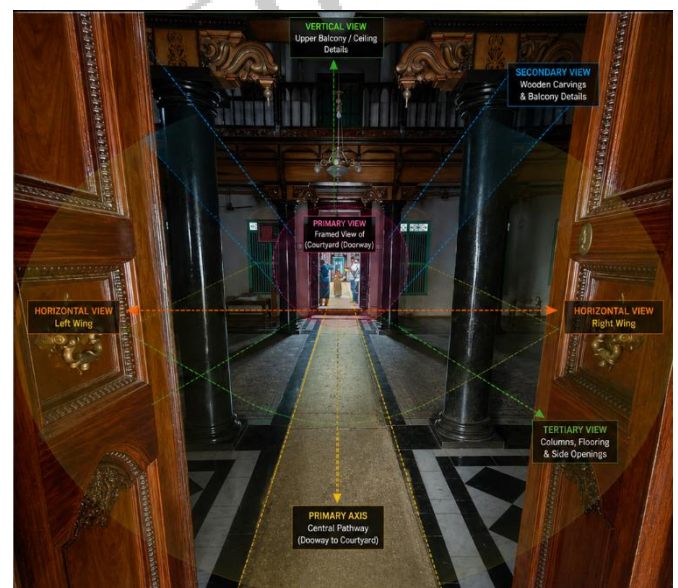


Figure 4.6.II

III. Cone of Vision at the Thinnai

The thinnai creates a carefully controlled visual connection between the street and the interior of the house. From outside, the observer can partially see into the house, but the interior remains only partly visible. Columns, walls, and shaded spaces limit the cone of vision, allowing glimpses rather than complete views.

This controlled visibility serves an important purpose. It protects the privacy of the household while also creating curiosity and visual interest for visitors or passersby. The thinnai therefore acts not only as a physical threshold but also as a perceptual one, where the architecture invites attention without fully revealing the private domestic space.

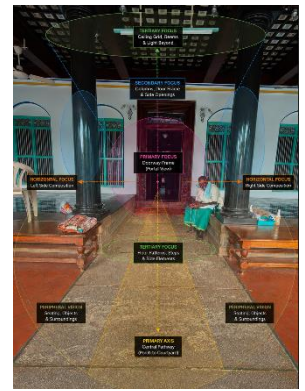


Figure 4.6.III

IV. Cone of Vision in the Courtyard

The courtyard provides one of the most open visual experiences in the Chettinad house. Standing at its centre, the observer can view surrounding corridors, adjoining rooms, decorative columns, and the open sky from a single position. Unlike the narrow and directed visual fields of earlier spaces, the courtyard offers a broad and almost uninterrupted visual experience.

This openness reinforces the courtyard's role as the social and spatial centre of the house. The wide field of vision creates a feeling of connection, openness, and shared activity, making the courtyard an important place for family interactions and everyday life (Prakash & Mahalakshmi, 2017).

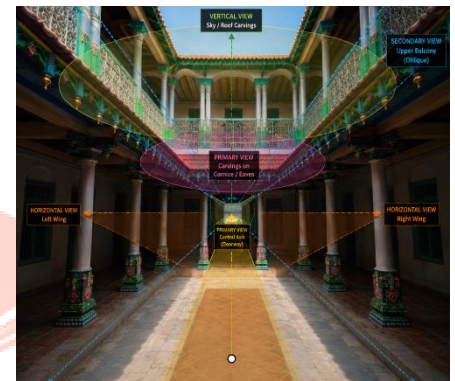


Figure 4.6.IV

V. Cone of Vision: Courtyard to Private Rooms

As movement continues from the courtyard toward the private rooms, the visual experience gradually changes once again. Openings become smaller, light levels decrease, and spaces begin to feel more enclosed. The cone of vision narrows, reflecting a transition from communal areas to more private and intimate spaces.

Rather than creating a sudden separation, the architecture carefully manages this shift through gradual spatial changes. Deeper wall openings, reduced visibility, and softer lighting create a sense of privacy and retreat. The movement from shared spaces to more private areas in a Chettinad house is designed to feel gradual and seamless rather than abrupt. Changes in visibility, enclosure, and lighting subtly guide occupants through different levels of privacy. This careful spatial organisation reflects how traditional Chettinad architecture responds to everyday living patterns while also supporting social interaction and personal comfort within the home.



Figure 4.6.V

V.CONCLUSION

This study set out to understand Chettinad residential architecture not simply as a historical or ornamental tradition, but as a carefully composed visual and spatial experience. By examining a single heritage house in Kothamangalam through the combined lenses of formal, functional, meaningful, and sustainable beauty, alongside silhouette complexity, mass-fenestration relationships, and cone of vision theory, the research offers an integrated framework that has been largely absent from earlier scholarship on the region.

The findings show that the aesthetic power of the Chettinad house does not rest on any single quality but on the way several dimensions reinforce one another. Formal beauty is expressed through the symmetry, rhythm, and proportion of the street facade; functional beauty emerges from spaces such as the mutram and thinnai, which perform practical environmental roles while remaining visually and socially significant; meaningful beauty is carried through carved doorways, motifs, and Athangudi tilework that encode

cultural memory and status; and sustainable beauty is embedded in thick lime-plastered walls, shaded verandahs, and courtyard ventilation strategies that were refined long before contemporary sustainability discourse existed.

The analysis of silhouette complexity demonstrated that the visual identity of the house changes meaningfully with viewing position, with the frontal view emphasising unified symmetry and the angled corner view revealing depth, shadow, and three-dimensional richness. Similarly, the study of mass-fenestration relationships confirmed that the balance between solid walls and openings is not incidental but a deliberate response to both climatic performance and visual hierarchy, particularly at the scale of the main entrance.

The application of cone of vision theory across the sequence of street, thinnai, entrance, courtyard, and private rooms illustrated how the house choreographs perception over time. Visual fields narrow and expand at key thresholds, producing effects of anticipation, release, privacy, and openness that align the physical journey through the house with a carefully staged emotional and sensory experience. This confirms that Chettinad architecture should be read as a sequential spatial narrative rather than a static composition.

Taken together, these findings support the five-point planning framework proposed in this study, which links silhouette design, mass-fenestration balance, courtyard-centred ventilation, threshold-based privacy gradients, and sequential spatial staging as transferable principles for contemporary sustainable housing. Rather than treating vernacular precedent as a matter of stylistic imitation, this framework positions Chettinad design logic as a source of adaptable strategies for architects working on climate-responsive, culturally rooted residential design today.

The study is limited by its single-case, qualitative design, and by the use of one representative house within one village context. Future research would benefit from comparative analysis across multiple Chettinad houses of varying scale and condition, quantitative validation of cone of vision and silhouette measurements, and testing of the proposed five-point framework in contemporary design applications. Even within these limitations, the study demonstrates that a structured, perception-based method of analysis can reveal architectural qualities of vernacular housing that remain relevant well beyond their original historical and climatic setting.

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