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# Cultivating Water-Human Intimacy within the Built Environment: Insights from the Master of the Nets Garden

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*Water plays a fundamental role in human survival and well-being. Despite extensive research highlighting the importance of water-human relationships, how to cultivate intimacy between them at the architectural scale remains largely underexplored. This article explores this dynamic through a case study of the Master of the Nets Garden in China. Using spatial, empirical and experiential analyses, it introduces a three-stage framework that integrates both quantitative and qualitative methods and examines various conditions within the garden that foster intimacy between visitors and water. It concludes that spatial conditions within the perceptual sphere of water, enabling diverse experiential modes, are crucial for fostering a sense of intimacy between visitors and water at the architectural level. The article highlights water-human intimacy as a core value of water-centric built heritage. This value remains significant for researchers, spatial practitioners and policymakers, offering important insights for heritage preservation and sustainable development.*

**Keywords:** water-human relationship, Chinese built heritage, perceptual sphere, spatial-visual stimulus analysis, spatial conditions analysis



< Fig.1 The central landscape area of the Master of the Nets Garden (Source: Li Lu, 2018).



## **Introduction**

Water plays a fundamental role in human survival and well-being (Hein et al. 2022). Research suggests that an intimate water-human relationship – one that fosters enjoyable interactions in everyday life, such as recreation, relaxation and aesthetic appreciation – significantly enhances physical, mental and social health (Ampatzidis and Kershaw 2020; Boers et al. 2018; Hein 2023; Huang et al. 2022; Nutsford et al. 2016; Zhang, Nijhuis and Newton 2023a). While factors and indicators leading to such a beneficial water-human relationship have been widely discussed (Boers et al. 2018; Nutsford et al. 2016; Zhang, Nijhuis and Newton 2023a; Chen and Yuan 2020), these studies are often constrained by their quantitative focus. Consequently, they primarily address statistical manifestations of the water-human relationship at the city or regional scale, overlooking its nuanced manifestations in individual experiences at the architectural scale. Understanding the water-human relationship at this micro level is crucial, as it is through day-to-day interactions that a meaningful and beneficial connection forms.

This article explores how water-human intimacy can be fostered at the architectural scale through embedded spatial-experiential conditions. Here, spatial-experiential conditions refer to formal or physical elements integrated into the built environment that facilitate specific spatial experiences. This article focuses on the Chinese literati garden, a classical built form of landscape architecture in ancient China. These gardens are significant for their historical, cultural and aesthetic value and are renowned for the sophisticated garden-making techniques used to foster harmony between humans and nature, with a particular emphasis on the water connection (Keswick, Jencks and Hardie 2003;

Lu 2022). We use the Master of the Nets Garden in Suzhou as a case study. Celebrated for its water-centric design, this garden exemplifies how built environments at the architectural scale cultivate intimacy between water and humans through various spatial conditions.

Our methodology integrates spatial, empirical and experiential analyses. The spatial analysis examines the embedded conditions that facilitate a sense of intimacy, while the empirical and experiential analyses reveal how this sense of intimacy emerges from these conditions. Our inquiry begins with the most fundamental aspect of the water-human relationship – the human perception of water – as a starting point, providing a solid foundation for further examination. In this research, we focus predominantly on the spatial-visual dimension of water perception, as research in cognitive psychology indicates that visual perception accounts for 80–85 per cent of our interactions with the environment (Nijhuis, Lammeren and Antrop 2011). Specifically, we first analyze the spatial-visual sphere of water – a visually defined spatial framework that enables human perception of water – within the garden, where visitors directly engage with both water and the space it frames. We then identify the water-related experiential modes associated with this framework, followed by a detailed examination of the spatial conditions that facilitate these modes of experience.

This article concludes that the density and diversity of spatial-experiential conditions within the garden's perceptual sphere of water are critical in shaping and enhancing intimacy between water and visitors at the architectural scale. Furthermore, it highlights water-human intimacy as a core value of water-centric built heritage. This understanding provides researchers, spatial practitioners and policymakers with es-

sential insights for incorporating this value into spatial interventions, ultimately enhancing the water-human relationship in the contemporary world.

### **Case Selection and a Three-Stage Analytical Framework**

The Master of the Nets Garden is one of the smallest “literati gardens” in Suzhou, with an area of just 5,400 m<sup>2</sup>, significantly smaller than the Lion Grove Garden (11,000 m<sup>2</sup>), the Lingering Garden (23,300 m<sup>2</sup>) and the Humble Administrator’s Garden (52,000 m<sup>2</sup>). Despite its compact size, the garden’s cultural, historical and aesthetic values have garnered global acclaim. The garden stands as a prime example of ancient Chinese built heritage sites (UNESCO 2004). Its delicate spatial design, finely balanced layout, picturesque views and poetic atmosphere all contribute to its exceptional ability to generate rich, multi-dimensional and infinitely flowing spatial experiences within a confined area.

We selected the Master of the Nets Garden for our case study for two primary reasons. First, as a key example of water-centric built heritage in ancient China, the garden vividly demonstrates the crucial role of water in shaping both spatial and experiential frameworks within the built environment, encouraging awareness and appreciation of water (Lu 2022; UNESCO 2004; Liu 1979; Zhou 1999). Second, despite its small size, the garden features complex, rich and densely embedded spatial-experiential conditions, illustrating how high-quality water-human intimacy can be cultivated in confined spaces through carefully organized spatial configurations (Keswick, Jencks and Hardie 2003; fig. 1). To analyze these aspects, this study introduces a three-stage analytical framework, offering a

systematic approach to understanding the interplay between water, space and human experience.

We first examine where visitors have direct sensory engagement with water in the garden, referred to as the “perceptual sphere of water.” In this research, we focus on one dimension of the perceptual sphere shaped by water – the spatial-visual sphere – as visual perception predominantly influences one’s experience within the garden. Using digital models and analytical tools, we quantitatively represent the spatial-visual sphere of water within the garden. Next, we delve deeper to examine the types of experiences that this spatial-visual connection with water creates. These water-related experiences naturally follow specific patterns, which we call “modes of experience.” To identify these patterns, we use on-site participatory observation and reflexive introspection (Xue and Desmet 2019). Finally, we investigate how these modes of experiences occur within the spatial-visual sphere of water and identify specific spatial conditions embedded to enable their occurrence.

### **Stage 1: Mapping the Spatial-Visual Sphere of Water Within the Master of the Nets Garden**

In the context of this article, the spatial-visual sphere of water refers to the territory where a visitor can see any portion of a water feature. This concept is crucial for understanding the water-human relationship within a built environment, as it represents the fundamental condition through which the visual perception of water occurs. In Chinese literati gardens, visual perception plays a dominant role. As Lu (2011) notes, “seeing has a psychological value that drives the visitor’s exploration.” Therefore, while the spatial-visual sphere is only one dimension

of water-human intimacy – among others, such as auditory and olfactory – mapping it within the garden provides a foundation for further analysis of the conditions that facilitate this intimacy.

### *Data Processing*

We use 3D isovist analysis within a Rhino-Grasshopper environment to objectively capture visual perceptions of water bodies in the Master of the Nets Garden. This method is particularly suited to complex environments at the architectural scale due to its ability to incorporate detailed three-dimensional digital models and viewer traits (Zhang, Nijhuis and Newton, 2023c). The data processing includes several key steps:

1. Model reconstruction – Based on field observations and the 1960s garden map (Liu 1979), we reconstruct a detailed 3D garden model, maintaining its traditional layout and minimizing later distortions.
2. Spatial division – We segment the garden's central water body and accessible areas into small cells measuring 0.5 by 0.5 meters.
3. Establishing viewing points – We establish a viewing point at the center of each cell, excluding those submerged in water, to perform 3D isovist analysis. We consider individual viewing features and potential obstructions like vegetation and buildings.
4. Visibility calculation – We analyze the visibility of the central water surface from each designated viewing point by calculating the number of visible water cells. This metric quantifies the extent of visual access to water from various locations within the garden.
5. Proportional analysis and visualization – We determine and visually display the proportion of water bodies visible from each area unit.
6. Examination and correction – Due to technical constraints, some inconsistencies arose

between the stimulus analysis results and our site observations. To ensure accuracy, we reviewed and manually corrected these inaccuracies based on on-site experiential observations.

This approach offers a quantitative representation of the perceptual sphere of water within the garden, serving as the first step toward understanding how water-human intimacy is cultivated.

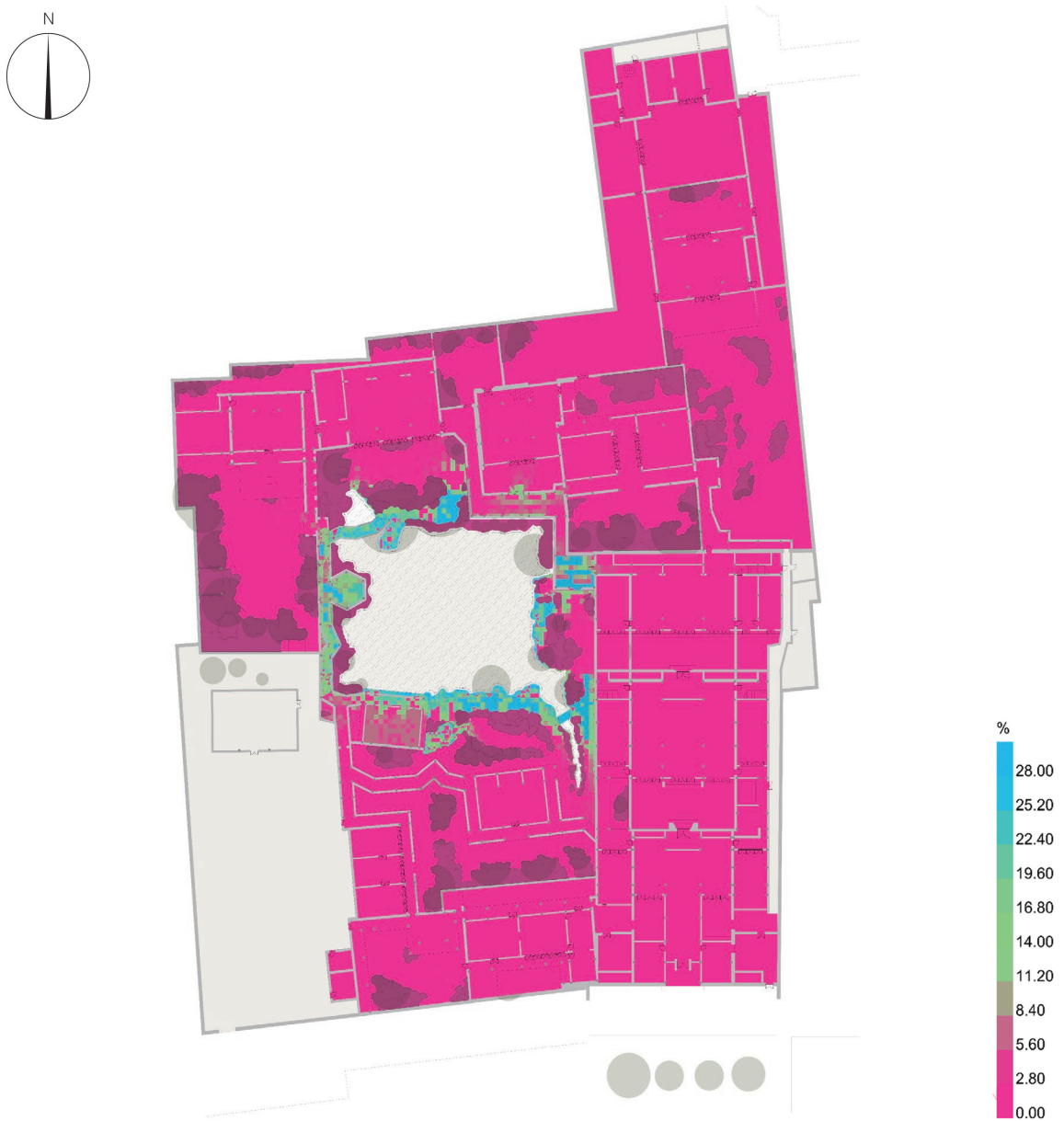
### *Analysis Results*

Our analysis quantifies the visibility of the water body from various locations within the garden, expressed as percentages (fig. 2). The diagram uses different colors to represent this visibility: areas where more than 28 per cent of the water is visible are shown in sky blue (indicating good visibility), while areas where the water is entirely obscured are marked in deep purple (indicating poor visibility). The visibility range between these extremes is divided into 10 levels, each represented by a gradually shifting color gradient.

The diagram shows that visual engagement with water in the Master of the Nets Garden is predominantly concentrated around the central water area (fig. 1). Most of the footpath surrounding this water area exhibits high visibility, with more than 19.6 per cent of the water body visible on average, indicating that visitors can see a significant portion of the water from most parts of this path. In areas adjacent to the footpath, visibility percentages range from 11.2 per cent to 19.6 per cent. Further away or in obstructed areas, less than 11.2 per cent of the water is visible. Additionally, visitors in nearby courtyards occasionally have visual access to the water, suggesting that visual engagement with the water extends beyond the physical boundaries of the central area.

This mapping method offers dual advantages over purely experiential descriptions or quantitative analyses: It delivers a precise quantitative analysis of visitors' water exposure while enabling a nuanced qualitative interpretation of the relationship between humans and water. The results reveal intricate spatial dynamics not

only around the water body but also throughout the garden, extending into many interior and exterior areas far from the water. This approach demonstrates how the spatial-visual framework formed by water influences human-water interactions across different parts of the garden.



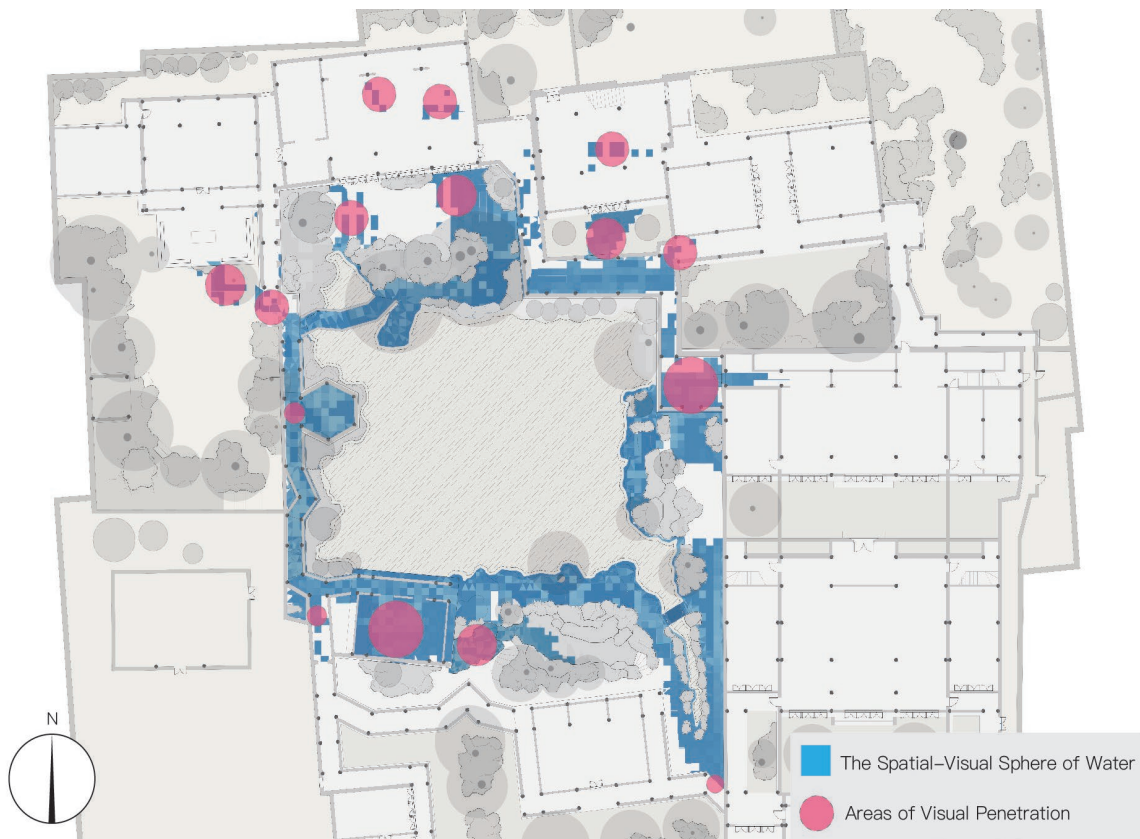
^ Fig. 2 An analysis of water visibility within the Master of the Nets Garden (Source: Li Lu and Haoxiang Zhang, 2024).

### Interpretations

The results provide a solid foundation for further exploration of how water-human intimacy is generated and manipulated within the spatial-visual framework centered around the central water feature. First, the results highlight significant visual exposure to water in areas surrounding the central water body. Visitors in these locations frequently enjoy expansive water views, experiencing a high level of water-human intimacy. Additionally, the findings reveal that visual perceptions often extend beyond these immediate areas into more enclosed architectural spaces, such as halls, corridors and courtyards near the water (fig. 3). This visual penetration is facilitated by spatial elements such as doors, openings and lattice windows

in the walls. These features help visitors maintain a visual connection with the water as they navigate various interior and exterior spaces beyond the central landscape.

Second, the results suggest deliberately manipulating water visibility within the garden. By controlling the view of the water from different vantage points, the garden has allowed visitors to perceive only portions of the water – sometimes small, sometimes large – while they move through the central landscape. This creates the impression that the water extends beyond what is immediately seen, giving the illusion that the water body is larger than it is (fig. 4). This technique, often referred to as “seeing the large in the small” [小中见大], is widely employed in traditional Chinese landscape and architecture



^ Fig. 3 An analysis of the visual penetration of water within the Master of the Nets Garden (Source: Li Lu and Haoxiang Zhang, 2024).





^ Fig. 4 A corner of the central water body. Although only a narrow, elongated corner of the water can be seen from this perspective, it creates the impression that the water extends far beyond what is immediately seen (Source: Li Lu, 2018).

al design (Keswick, Jencks and Hardie 2003; Dong 2016; Gu 2010; Guo and Zhang 1963; Wang 2017). It enhances visitors' perception of water by creating an illusion, leaving a vivid and expansive water image in visitors' minds.

Third, the results reveal a dynamic spatial-visual mechanism related to the central water feature. As visitors navigate around the water, their attention continually shifts among various focal points: a bridge at the water's edge, a rockery beside the water, or a veranda hanging above the water (fig. 5). As these elements are strategically designed and positioned in formal and spatial relation to the water, while visitors' focus shifts from one point to another, they often gain a stronger impression of the central water

feature. While capturing and releasing these focal points, objects transform into symbols, with meanings generated in visitors' minds at each instance of focus. For example, focusing on (and then shifting attention away from) the space formed by the Pavilion for the Advent of Moon and Wind immediately suggests the possibility of lingering there and enjoying the surrounding water view, which subsequently evokes feelings of relaxation and pleasure. Visitors develop a strong and meaningful connection with the space by dynamically engaging with various landscape and architectural elements related to the water.

Building on these findings, we can now identify the various modes of experience related to the perceptual sphere of water. These modes, facilitated by various conditions embedded within these perceptual spheres, play a crucial role in shaping water-human intimacy.

## Stage 2: Identifying Water-Related Modes of Experience within the Garden

A mode of experience, as we use the term here, refers to a recurring pattern of experiences. Psychological, behavioral and philosophical studies suggest that when sufficient and appropriate conditions are carefully embedded within a built environment, its experiences tend to follow distinct patterns (Lu 2022). These experiential patterns are often encouraged by a series of spatial conditions. When the triggering spatial conditions of a pattern are related to a perceptual sphere of water, the pattern becomes water-related. Many water-related experiential patterns are observable within a built environment, manifesting human-water intimacy.

Through extensive participatory observation and reflexive introspection during our site in-

vestigation, we have identified 10 modes of experience within the Master of the Nets Garden: wandering, lingering, resting, reflecting, reading, meeting, crossing, ascending/descending, capturing/releasing and scenery enjoying (Lu 2022). Table 1 provides a detailed description of these modes of experience and illustrates the typical circumstances under which they occur. It is important to note that the images in this table do not always depict the experiences themselves but rather the conditions that enable them. Each circumstance typically involves a set of conditions, which will be explored in the following section.

### Stage 3: Examining the Spatial Conditions Contributing to Water-Human Intimacy

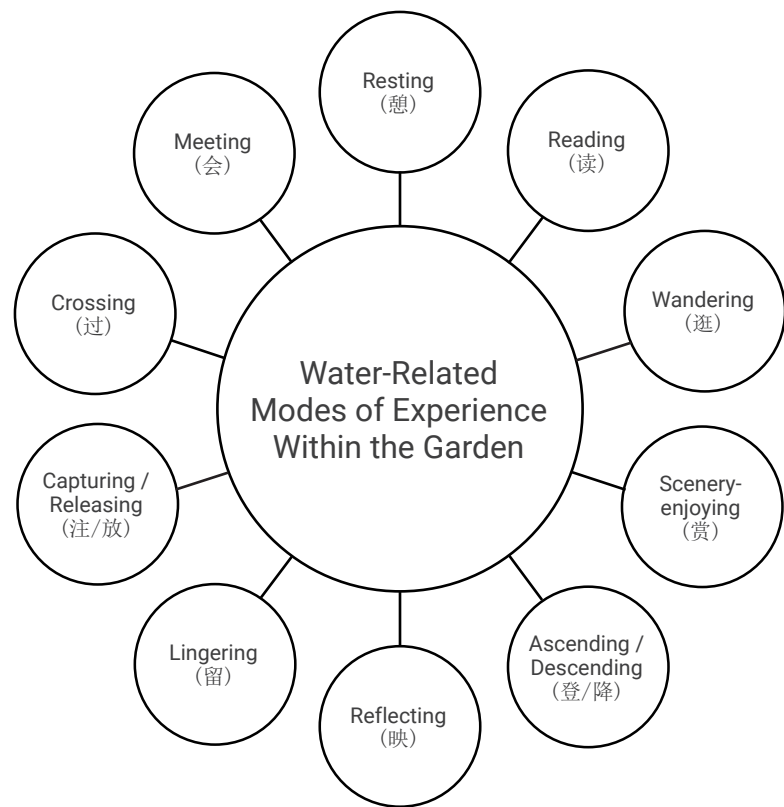
After identifying the modes of experiences within the visual sphere of water, we further examine the spatial conditions related to them. As illustrated in Table 1, all 10 modes of experience frequently occur under conditions closely tied to the visual sphere of water within the garden. By examining how these spatial-expe-

riential conditions are embedded and organized around the water body, we can gain insight into how intimacy between water and humans is cultivated within the garden. Table 2 lists the identified spatial conditions and the corresponding modes of experience contributing to water-human intimacy. Additionally, we mark the location of some typical conditions on the map (fig. 7).

This detailed examination helps illustrate how specific spatial elements and their arrangements foster intimate interactions between visitors and the water, enhancing the overall water-related experience within the garden. As these modes of experience all occur within the visual sphere of water, they are naturally either water-related (with water as the content of the experience) or water-inspired (with water as the trigger of the experience). The results reveal 10 distinct categories of water-human intimacy, each corresponding to specific modes of experience: resting near water, reading beside water, crossing above water, wandering along-water, reflecting within water, meeting near water, enjoying the scenery of water, descending/



^ Fig. 5 A panorama of key elements around water. As visitors navigate around the central water feature, their gaze dynamically shifts between focal points (Source: Li Lu, 2018).




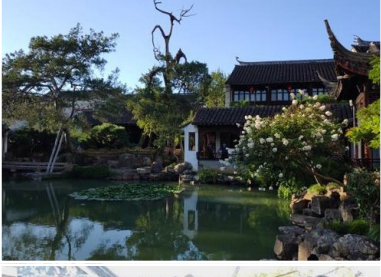



^ Fig. 6 Modes of experience that occur within the spatial-visual sphere of water in the Master of the Nets Garden (Source: Li Lu, 2024).



ascending to appreciate water, lingering around water and capturing/releasing the view of water (Table 2). As demonstrated, various intricate spatial conditions are embedded in the visual sphere of water, facilitating the dynamic occurrence of these modes of experience. Consequently, a rich and profound water-human intimacy is established. This understanding provides researchers, spatial practitioners and policymakers with essential insights for incorporating this value into spatial interventions, ultimately enhancing the water-human relationship in the contemporary world.

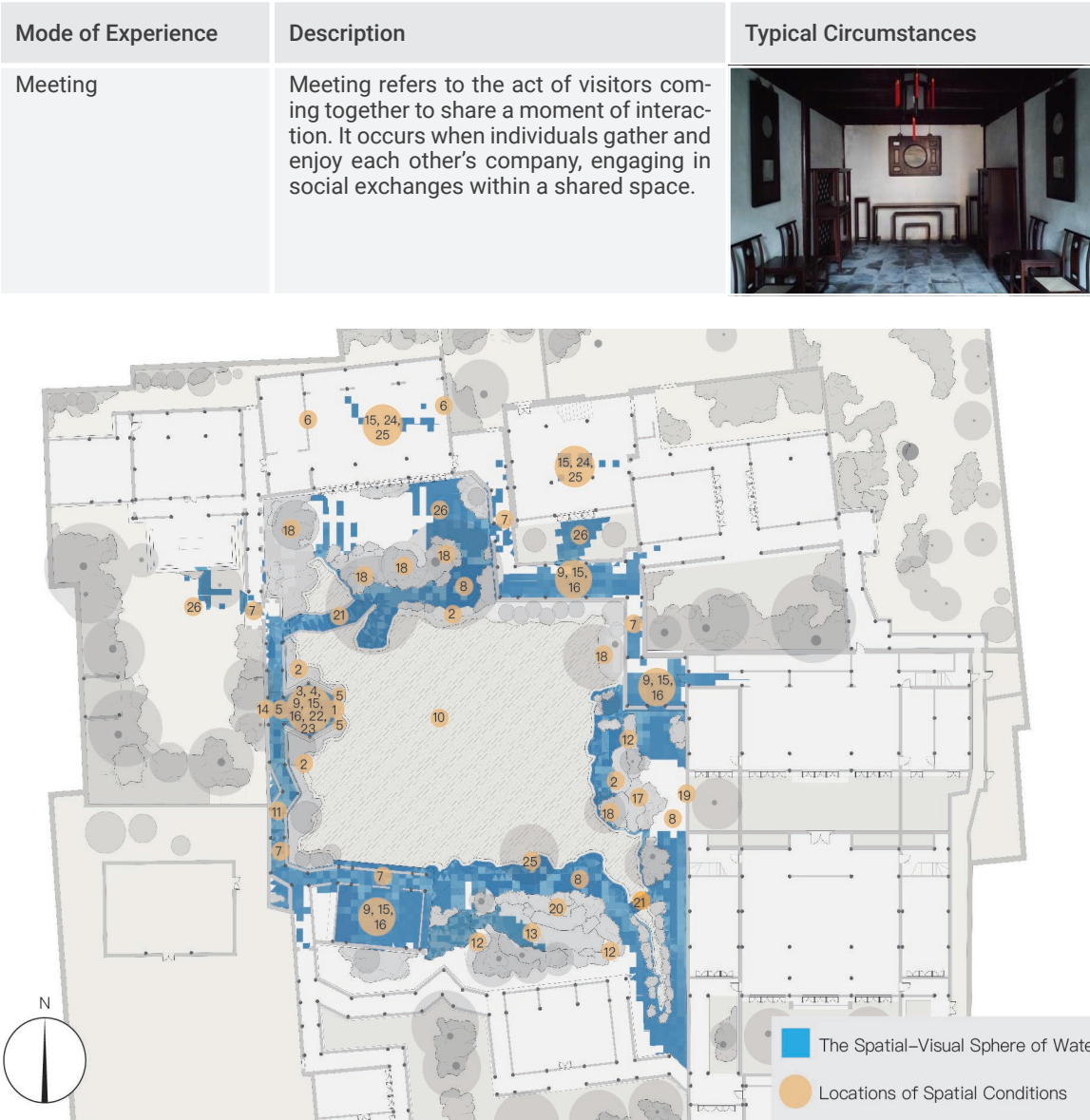


Mode of Experience	Description	Typical Circumstances
Resting	Resting is the act of relaxing to relieve fatigue or stress. It occurs when one achieves a state of physical, mental and emotional calm.	
Reading	Reading is a “complex cognitive process of decoding symbols to derive meaning” (Hans and Hans 2013). It occurs when this process of decoding is engaged.	
Wandering	Wandering is characterized by aimless or unsystematic movement across various spaces within a garden. It occurs as a dynamic, continual physical flow without a predetermined purpose or destination.	
Enjoying scenery	Scenery-enjoying refers to the appreciation of aesthetically arranged landscapes within one’s surroundings. It occurs when visitors engage visually and emotionally with the carefully composed elements of the landscape.	
Ascending/descending	Ascending/Descending encompasses a cluster of experiences associated with vertical movement within a space. It occurs when an individual physically moves upward or downward, navigating different elevations.	

^ Table 1 Description of 10 modes of experiences and typical circumstances identified within the visual sphere of water (Source: Li Lu and Haoxiang Zhang, 2024).



Mode of Experience	Description	Typical Circumstances
Reflecting	Reflecting involves becoming aware of one's environmental surroundings through a reflective surface within a space. It occurs when these reflective elements highlight or alter the perception of the surrounding environment.	
Lingering	Lingering refers to an extended stay within a particular space, dominating both spatial and temporal aspects of one's experience. It occurs when one halts their continuous movement to remain in a location, allowing time to appreciate and engage with the surrounding entities. Intriguingly, lingering can serve both as a cause and consequence of many other experiential modes.	
Capturing/releasing	Capturing/Releasing involves a group of experiences directly tied to the shifts in a visitor's conscious awareness. Capturing occurs when an entity enters the visitor's consciousness, marking the moment of engagement. Conversely, releasing happens as the entity departs from the visitor's conscious attention, signaling disengagement. This dynamic process reflects the visitor's mental engagement and disengagement with the environment, impacting their overall experiential journey.	
Crossing	Crossing refers to the act of physically moving across a space. It occurs when an individual travels from one area to another, facilitating transitions within the environment.	



^ Fig. 7 Locations of typical corresponding conditions within the visual sphere of water (Source: Li Lu and Haoxiang Zhang, 2024).

Mode of Experience (related to water)	Corresponding conditions within the spatial-visual sphere of water
Resting (near water)	A wall to lean against, a rock to sit on (2)
	Beauty's Arm Bench, suitable for one to comfortably sit on (1)
	A roof that offers shelter from inclement weather (3)

^ Table 2 Identifying conditions in the spatial-visual sphere of water corresponding to the 10 modes of experiences (Source: Li Lu and Haoxiang Zhang, 2024).

Mode of Experience (related to water)	Corresponding conditions within the spatial-visual sphere of water
Reading (besides water)	An area where inscribed characters are easy to read (4)
	Calligraphy inscribed in plaques or stelae (5)
	A painting displayed on a wall (6)
Wandering (along water)	A continuous, covered corridor that allows for enjoyable views while walking in a relaxed, pleasant and comfortable mood (7)
	A walkway alongside rocks, trees, shrubs, flowers and grass that facilitates strolls in a relaxed, pleasant and comfortable mood (8)
Enjoying scenery (of water)	A place designed and built to allow one to enjoy the surrounding landscapes (9)
	A water-centered area, harmoniously integrated with various landscape and architectural elements, creating a picturesque scene (10)
Ascending/Descending (for appreciating water)	An ascending or descending path to follow (11)
	Stairs inviting visitors to ascend or descend (12)
	A rocky, mountain-like segment standing by the south of the pond (13)
Reflecting (through/of water)	A mirror on the wall of the corridor beside the Pavilion for the Advent of Moon and Wind (14)
	An area where reflections in the mirror can be consciously perceived
Lingering (around water)	A sheltered place that protects visitors from natural disruption, allowing them to remain for an extended period (15)
Capturing/Releasing (of water view)	An elegantly shaped architectural feature designed to capture visitors' interest (16)
	A carefully arranged rock formation intended to draw visitors' attention (17)
	An eye-catching tree (18)
	A long wall that divides the garden into sections, strategically guiding and manipulating attention (19)
	A rocky, mountain-like area that interrupts and redirects visitors' sightlines (20)
	A picturesque composition visible through an opening in the wall
Crossing (above the water)	A tiny, curved stone bridge spanning the narrow end of the water pond (21)
	A courtyard that invites visitors to walk across it (26)
Meeting (near water)	A round stone table surrounded by four stone chairs in the center of the pavilion (22)
	A hexagonal pavilion floor that generates a centripetal trend (23)
	A symmetrical, well-lit hall (24)
	Two south-facing chairs positioned on a central axis in the hall, with an elaborately painted screen behind them and a table between them (25)

## Conclusion

This article has delved into the rich and profound water-human intimacy cultivated within the built environment at the architectural level, using the Master of the Nets Garden as a case study. By integrating spatial, empirical and experiential analyses, the study has revealed how water features within built environments frame spaces and shape spatial experiences, fostering a pervasive intimacy between water and visitors through a series of spatial-experiential conditions. Our findings highlight several critical insights.

**The role of the spatial-visual sphere of water:** Our analysis demonstrates that perceptual spheres play a fundamental role in establishing water-human intimacy within the built environment. These spheres form the spatial-experiential framework under which water-human intimacy occurs. Although this article focuses on the spatial-visual dimension, it is worth noting that this framework has a multi-dimensional structure.

**Diverse modes of experience:** Our identification of 10 water-related modes of experience indicates that water-human intimacy is shaped by how individuals interact with water through various experiential patterns. Therefore, stimulating diverse modes of experience is essential for cultivating a rich and profound water-human intimacy.

**Impact of spatial-experiential conditions:** Our examination reveals that the density and diversity of spatial-experiential conditions within the perceptual sphere of water are crucial in shaping the quality of water-human intimacy. As demonstrated by the case study, higher density and greater diversity enhance visitors' sensory engagement with water, thereby strengthening their connection to it.

Overall, this study highlights water-human intimacy as a core value of water-centric built heritage and analyzes how this intimacy can be fostered through carefully designed and integrated spatial-experiential conditions within a built environment. The method we used does have some limitations, particularly in the precision of the digital model and the matrix size for calculation. These limitations restrict our ability to capture visitors' visual perceptions fully. In the future, incorporating point cloud techniques and advanced computing capabilities could improve the detail and accuracy of representations of individual visual experiences.

Despite these challenges, the method holds considerable promise and can be applied in many areas. It offers a valuable framework for researchers, spatial practitioners and policy-makers to better understand and evaluate the water-human relationship in water-centric built environments, providing detailed, precise and nuanced insights to foster a beneficial water-human relationship in the contemporary world.



### Policy Recommendations

- **Go beyond the statistical approach:** The experiential quality of the water-human relationship deserves equal (if not greater) attention compared to its statistical manifestations. Combining spatial, experiential and empirical analysis provides a deeper understanding of this relationship and can help develop more beneficial and sustainable water-centric environments.
- **Maintain the water-human relationship as a core value:** Appreciating the intrinsic relationship between humans and water within the water-centric built heritage and maintaining it as a core value in conservation can promote both heritage preservation and sustainable development.

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## References

- Ampatzidis, Petros, and Tristan Kershaw. 2020. "A Review of the Impact of Blue Space on the Urban Microclimate." *Science of the Total Environment* 730, no. 139068. <https://doi.org/10.1016/j.scitotenv.2020.139068>
- Boers, Susanne, Karin Hagoort, Floortje Scheepers and Marco Helbich. 2018. "Does Residential Green and Blue Space Promote Recovery in Psychotic Disorders? A Cross-Sectional Study in the Province of Utrecht, the Netherlands." *International Journal of Environmental Research and Public Health* 15, no. 10: 2195. <https://doi.org/10.3390/ijerph15102195>
- Chen, Yujie, and Yuan Yuan. 2020. "The Neighborhood Effect of Exposure to Blue Space on Elderly Individuals' Mental Health: A Case Study in Guangzhou, China." *Health & Place* 63: 102348. <https://doi.org/10.1016/j.healthplace.2020.102348>
- Dong, Yugan. 2016. 玖章造园 [Nine chapters on gardening]. Shanghai: Luminocity, Tongji University Press.
- Gu, Kai. 2010. "画意原则的确立与晚明造园的转折" [Establishment of picturesque principles for gardens and transition of garden-making in the late Ming]. *Architectural Journal*, no. 1: 127–29.
- Guo, Danheng, and Jinqiu Zhang. 1963. "苏州留园的建筑空间" [The architectural space of the lingering garden, Suzhou]. *Journal of Architecture*.
- Hans, Anjali, and Emmanuel Hans. 2013. "Role of Computers in Reading Skills." *IOSR Journal of Humanities and Social Science* 15, no. 4: 15–19. <https://doi.org/10.9790/0837-1541519>
- Hein, Carola. 2023. "Toward a Research and Action Agenda on Water and Heritage? A First Attempt at Refining Terminologies, Concepts and Priorities." *Blue Papers* 2, no. 1: 22–33. <https://doi.org/10.58981/bluepapers.2023.1.02>
- Hein, Carola, Matteo D' Agostino, Carlien Donkor, Queenie Lin and Hilde Sennema. 2022. *Blue Papers* 1, no. 1: 1–3. <https://doi.org/10.58981/bluepapers.2022.1.wcht>
- Huang, Baishi, Zhixin Feng, Zehan Pan and Ye Liu. 2022. "Amount of and Proximity to Blue Spaces and General Health among Older Chinese Adults in Private and Public Housing: A National Population Study." *Health & Place* 74, no. 102774. <https://doi.org/10.1016/j.healthplace.2022.102774>
- Keswick, Maggie, Charles Jencks and Alison Hardie. 2003. *The Chinese Garden: History, Art and Architecture*. Cambridge: Harvard University Press.
- Liu, Dunzhen. 1979. 苏州古典园林 [Suzhou classical gardens]. Nanjing: China Architecture and Building Press.
- Lu, Andong. 2011. "Lost in Translation: Modernist Interpretation of the Chinese Garden as Experiential Space and Its Assumptions." *Journal of Architecture* 16, no. 4: 499–527. <https://doi.org/10.1080/13602365.2011.598703>
- Lu, Li. 2023. *Towards A Poetics of Dwelling: Exploring Nearness Within the Chinese Literati Garden*. A+BE / *Architecture and the Built Environment* 12, no. 24: 1–334. <https://doi.org/10.7480/abe.2022.24.6888>
- Lu, Li, and Mei Liu. 2023. "Exploring a Spatial-Experiential Structure within the Chinese Literati Garden: The Master of the Nets Garden as a Case Study." *Frontiers of Architectural Research* 12, no. 5: 923–46. <https://doi.org/10.1016/j.foar.2023.05.011>
- Nijhuis, Steffen, Ron van Lammeren and Marc Antrop. 2011. "Exploring the Visual Landscapes: An Introduction." *Research in Urbanism Series* 2, no. 1: 15–39. <https://doi.org/10.7480/abe.2022.24>



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Nutsford, Daniel, Amber L. Pearson, Simon Kingham and Femke Reitsma. 2016. "Residential Exposure to Visible Blue Space (but Not Green Space) Associated with Lower Psychological Distress in a Capital City." *Health & Place* 39: 70–78. <https://doi.org/10.1016/j.healthplace.2016.03.002>

UNESCO. 2004. "Classical Gardens of Suzhou." UNESCO World Heritage List . <https://whc.unesco.org/en/list/813/>.

Wang, Baozhen. 2017. *造园实录* [Craft of three gardens: An architect's practice in Guangxi]. Shanghai: Tongji University Press.

Xue, Haian, and Pieter M.A. Desmet. 2019. "Researcher Introspection for Experience-Driven Design Research." *Design Studies* 63: 37–64. <https://doi.org/10.1016/j.destud.2019.03.001>

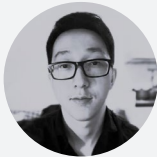
Zhang, Haoxiang, Steffen Nijhuis and Caroline Newton. 2023a. "Advanced Digital Methods for Analysing and Optimising Accessibility and Visibility of Water for Designing Sustainable Healthy Urban Environments."

*Sustainable Cities and Society* 98, no. 104804. <https://doi.org/10.1016/j.scs.2023.104804>

———. 2023b. "Advanced Digital Methods for Analysing and Optimising Accessibility and Visibility of Water for Designing Sustainable Healthy Urban Environments." *Sustainable Cities and Society* 98, no. 104804. <https://doi.org/10.1016/j.scs.2023.104804>.

———. 2023. "Uncovering the Visibility of Blue Spaces: Design-Oriented Methods for Analysing Water Elements and Maximizing Their Potential." *Journal of Digital Landscape Architecture*, no. 8: 628–38. <https://doi.org/10.14627/537740066>.

Zhou, Wei-quan. 1999. *中国古典园林史* [The history of classical Chinese gardens]. Beijing: Tsinghua University Press LTD.



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