

## the spatial language of a Chinese garden

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### Keywords:

spatial language; plot; syntax; Chinese garden

### Abstract

*The essay presents a new spatial language of gardens, space plot. It uses Yuyuan, a classical garden in Shanghai, as a case study to describe and analyse the complex structure in different methods of spatial analysis, syntax and plot. By comparison, it points out four main limitations in the process of applying syntactic analysis which is unsuitable to express the meaning of the garden-making although it could explore the cognitive complexity of the garden to some extent. Instead, it argues that space plot demonstrates considerably the essence of structure and poetry-configuring of the garden. This new language, through narrative vocabulary, linkage, content and structure, offers an effective approach to linking the physical system with its meaning during the formulating process as well as the cognitive process.*

### Introduction

Various devices have been employed to depict Chinese gardens: maps, paintings, drawing, poem, novels, historical records and so on. Generally, Chinese scholars tend to use the language of humanities (e.g. literature and art), rather than that of physical science, to elaborate on the complexity of Chinese gardens (for example, Peng, 1986; Dunzhun Liu, 1987; Ji, 1988; Qiheng Wang, 1992; Tong, 1997; Guixiang Wang, 1998; Zhu, 1998; Zhou, 1999; Chongzhou Cheng, 2002; Feng, 2003; Tingfeng Liu, 2005; Andong Lu, and Penz, 2005; Shen, 2008). Western world has shown an interest in Chinese gardens since the seventeenth century. For example, William Temple introduced Chinese Garden in his essay "Upon the Gardens of Epicurus" (Hunt and Wills, 1975). Keswick (1978) clearly examined the mystery of Chinese gardens with the similar language of philosophy, art and literature. In contrast, two different rational languages explored the complexity of Chinese gardens and architecture, e.g. shape grammar and space syntax.

George (1971, 2006) demonstrated that shapes might be as complex as anything else. He showed the possibility for shape grammars to interpret and generate existing design languages---the compositional conventions of Chinese lattice designs with five simple rules (George, 1977). His model made it easy and simple to understand Dye's grammars of Chinese Lattice Design, although it can't cover all the styles and patterns noted by Dye (1974) and Ji (1988). George and his followers also furthered shape grammars to examine the Japanese tearooms, Taiwanese traditional houses, and Chinese traditional Architecture (Li, 1999). Without predefined divisions, his mode is quite informal, paradigmatic and generative. However, little research has been done in the whole spatial structures in Chinese Architecture and Chinese gardens. They mainly focused on the research of single objects, architectural elements, and the visual form of the solid. In another words, they ignored the generating rules of the void (i.e. spatial system) in Chinese gardens. Next, Hillier (1996) took the sheer physical and spatial complexity of the city and set up a series of non-discursive technique through computer language as a simple but powerful strategy to detect patterns in the spatial organization. Chang (2007) used space syntax method to divide up, calculate and analyzed 310 spatial units in the Lin Family Garden in Taiwan. She attempted to

transform the complex space into quantification and to describe the degree of the integration of every space and walkway. Based on these data, she tried to find some new information from the structure, for instance, the walkways act as an important role in the garden. Could the data and quantification of space units describe the whole structure and meaning in the Chinese Garden?

The intention of this essay is simply to examine to what extent the method of space syntax can explore the complexity in Chinese gardens and to present an alternative language to analyze the complexities of the structure in Chinese gardens in a syntactic sense and semantic way as well. It focuses on one of the private Chinese gardens in Shanghai---Yuyuan, which is located in the old downtown. It was originally laid out in 1559 by an officer Yunduan Pan (Shanghai Administration of Yuyuan,1999). It took him twenty years to build the garden. Then, it has been repaired and reorganized for several times (Cheng and Wang, 2000). Today Yuyuan Garden has an area of about five acres. However, it gives the unexpected view and 'It is a fascinating architectural labyrinth, and contains almost all the delightful and surprising elements of a city garden' (Keswick ,1978, 125-7).

### Spatial Syntax: cognitive complexity of the physical structure

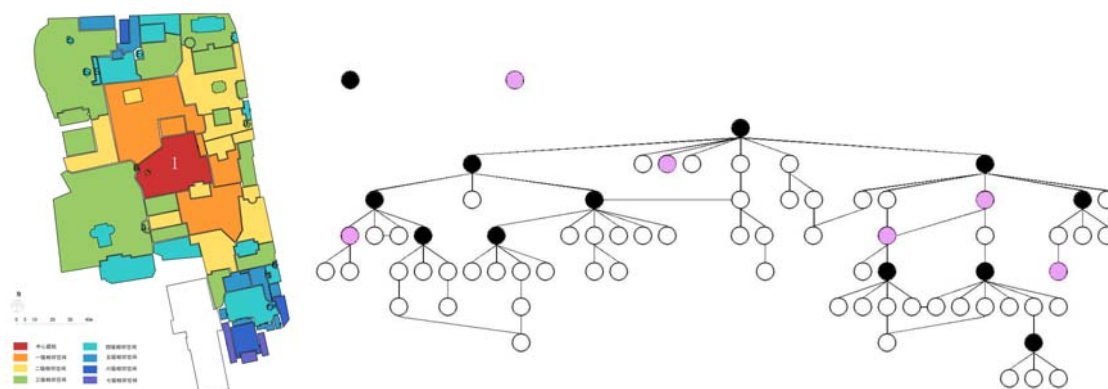


**Figure 1**

**(a - left)** The masterplan of the Yuyuan Garden; **(b - right)** Subgarden and its spatial structure in Yuyuan: **A** the subgarden of Sanhui Hall; **B** the subgarden of Wanhua Chamber; **C** the subgarden of Dianchun Hall; **D** the subgarden of Deyi Hall; **E** the subgarden of Yuhua Hall; **F** the subsection of Inner Garden; **G** the subgarden of HuxinTing.

In the master plan in Yuyuan garden, these enclosed courtyards or space cells are the basic component of the spatial structure<sup>1</sup>, e.g., a walled yard, a courtyard garden enclosed by buildings, a front courtyard garden of a building etc (Figure 1a,b). Although it is difficult to make sure how many mini-gardens within the whole garden, it is clear that the garden covers seven main subgardens. Besides the open-sided section of Huxin Pavilion(G), the other six ones are in sequence: the subgarden of Sansui Hall (A), Wanhua Chamber (B), Dianchun Hall (C), Deyi Hall (D), Yuhua Hall (E) and the Inner Garden (F) (Figure 1a,b). Every subgarden is completely enclosed by walls with the gateways to connect each other and the spatial layouts of the garden could be represented as a pattern of convex spaces or visual field covering the layout (Hillier and Tzortzi, 2005). What is the relationship between each space cell and all? The total depth from the central courtyard of Deyi Hall, for example, could be examined (Figure 2, see the top point). In Figure 2, a

few local-focused courtyards (black points) can be found to connect several tiny spaces and architectural spaces around it. Some of them are in routes with dead ends, others are probably linked in sequence, and one of these tiny spaces normally develops as a young local-focused courtyard space. In another words, every space cell in this structure enjoys different degree of integrated or segregated relation between each other. According to Hillier's generic language (2005), there are mainly four types which space cells serve as in the global structure of the garden: 1-connected type (i.e. a dead end), more than one connection on the way to a dead end, 2-connected type on the circulation ring, and more than 2-connection on at least two rings. In Yuyuan, these local-focused courtyards usually have more than two connections and lie on at least one circulation ring, which link space cells the within the branching system or across it. About 40% of space cells act as dead ends, which serve as functional architecture. More than 50% of space cells enjoy at least 2-linkages, which provide an alternative way back. Definitely this tree-like structure is different from those of a museum and city (Hillier,1996).



**Figure 2**

*The accessibility of the central courtyard in Yuyuan (Left) and Depth form the Deyi courtyard in Yuyuan (right). **Black point:** Local- leading space cell; the black point at top stands for the Deyi courtyard; **Red Point:** Exit& entrance; **White point:** Space cell*

Besides the spatial structure, this kind of similarity and complexity between part and whole can be examined in the system of circulation. Embedded circulation system connects garden buildings, gateways and space cells as well (Peng 1986; Keswick,1978). Yet, some of them end in a scenic building, some split up at the turning points. The local leading routes can be found in this system when the connectivity of the walkways' structure is examined, which enjoy the high degree of integration, such as twin corridor near Wanhua Chamber, zigzag bridge over the water in the front Deyi Luo, the long corridor in Yuhua Courtyard (Figure 3a). For instance, in the subgardens of Yuhua Hall and Deyi Hall, one of central paths and its connection in the whole system of circulation is examined (red line in Figure 3a), and it is clear that this path normally is shared by tiny circulations and subcirculations, and enjoys high-degree connectivity in the whole structure of circulation (Figure 3b). Meanwhile, the embedded system of circulation system mostly leads to the distinguished feature of choice and change: numerous "T-junction" and "L- turning point" occur in the structure (Figure 3a). That is to say, the circulation system with "junction and turn-point" (or "choice and change") makes a cognitive sense of complexity coloring the spatial structure (e.g., up and down, inside and outside, dark and bright), although sometime it misleads the visitors. For example, one of the routes, which can connect most of scenes and pavilions, shows the rhythm of choice and change. It is composed of walkway with shelters, outside paths, and interior passage. The frequency of changes has been examined (Figure 3c): about 88 points of junction for possible choice (blue line, 52%), and about 80 turning points forcing the visitors to turn (pink line, 58%). Actually, whatever circles or subcircle, leading path or not (Figure 3a), most of the walkways in this irregular structure zigzag forward at different levels and provide the possibility of choice and change for the visitors. In such a way, more T-junction and L-turning points and more chances of experience are available.

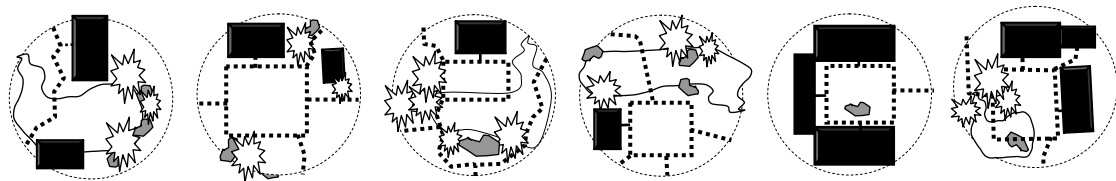
Returning to the masterplan of the garden, in every space cell, there is another factor of the complexity in the garden: visual fields, i.e. convex isovists. Most of elements, such as scenic building/walls, friendly plants and fantastic rocks, are arranged and gathered around the void, e.g. courtyard or waterscape, which define the physical boundaries of a space cell (Figure 4a). The distribution of these elements and the physical boundaries formulates the visual field of a space cell.



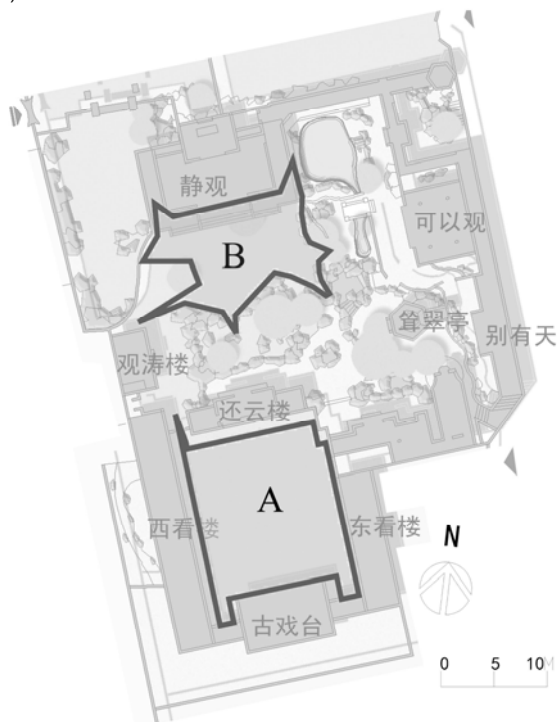
**Figure 3**

(a) The connection of the central path: Red route is the selected central; (b) The Diagram of the connection of central path in the whole system of circulation (Red point stands for the selected central path; different colour-points show the accessibility and connection to the central path.) (c) The rhythm of junction and turning point along the main visiting path ; Blue vertical line: junction point for possible choice; red vertical line: turning point for change

Broadly speaking, there are two kinds of edges to define convex isovists in space cells: distinct architectural edges (Figure 1a, 4b), and ambiguous enclosure (Figure 1a, 4b). Most subgardens in Yuyuan are remarkably 'divided by long, snaking walls, which undulate through the garden in regular curves to end in dragon-heads' (Keswick, 1978, 125), elegant corridors and buildings (4a, b, 7d). The other one is ambiguous interface with open visual 'windows' instead of walls, such as trees, rocks, portico/ a facade of a building, and an open-sided corridor (Figure 4a, b, 7a). Configuration of the convex isovists would be different if the size, dimension or the form of these objects has been changed. For instance, the subgarden of Deyi Hall can be divided into three tiny gardens by the loose interfaces defined by trees, and the gaps between trees/ pillars/ walls formulate visual 'windows' in the interface and lead to tiny gardens one after another, which makes convex isovists quite complex. So, with different number of building / path/ plant / rock / water / edge and their relatively location, the shape and structure of the convex isovists in the garden would be extremely complicated (Figure 4a, 4b).



a)



b)

**Figure 4**

*(a) Choreographic strategies of elements in the subgarden of Yuhua Hall; (b) Different types of edges in Inner garden (define different isovists)*

Representation of these elements and balance of these convex isovists in every space cell makes an extraordinary sense of similarity and diversity of the part and the whole. Certainly, the convex isovists shape the visual experience of the viewers in the whole garden. For instance, in the subgarden of Yuhua Hall (Figure 1a, b, 4a), every space cell enjoys its own amazing shape and intersection. The right tiny-garden accommodates two buildings (Tingtao Ge and Hanbi Lou), one pond with several trees and rockeries around. The left tiny-garden of Cuangshu (library) Lou has one gallery, one library, one courtyard edged with trees and rockeries. The top tiny-garden contains a square-courtyard with waterscape in the corner and two buildings around it. The centric

tiny-garden enjoys a huge "lake" and a famous rockery surrounded by the main hall, zigzag corridors and walls. Every space cell enjoys different convex isovists, which gives rise to cognitive similarity and complexity when visitors are strolling in the subgarden of Yuhua Hall. In the whole garden, the rhythm of spaces could be experienced in the way of convex isovists: from small to big, from void to solid, from low to high, from here and there (Figure 1a, 1b, 4a) (Tong,1997).

Furthermore, the buildings, which cover about 18% of land area in the garden (Figure 1a), act as distinctive edges of convex isovists in space cells. As an object (solid) at the edge of the courtyard, the building certainly shapes the form of visual fields. As a space, it can accommodate regular isovists and flexible activities. Whatever role it is, the building plays an inspiring and important role in the configuration and cognition of space cells in the garden. Similarly, the plant, the rock and other elements lead to the complicated relation in the garden.

Above all, with interactive space cells, richly interconnected routes and complicate visual edges (Barabasi, 2002; Passini, 1984), the cognitive complexity of the physical structure in the garden could be readable in a way of syntactic analysis, particularly in the accessibility of a space cell, connectivity of walkways and diversities of convex isovists. However, syntactic analysis can't show the configuring rules of physical structure, and can't be seen as spatial express of Chinese traditional culture, meaning in the garden. There are several limitations in the process of applying syntactic analysis.

First, space syntax normally uses the 2-D plans to analyze the inter-relation between spaces, but has not taken notice of the complicated 3-D interface and its information. In the garden, it is obviously clear to notice 'random' windows with hundreds decorated patterns on the every wall (Figure 4, 6), which lead to intricate convex isovists beyond the space cells.

Second, space syntax well describes the cognitive properties of space units or the degree of inter-relation between spaces rather than the configurative feature of the whole structure in the garden, as space syntax is based on the interaction between visual experience /human activities and built environment. This logical language has rarely discovered the configuring rules of the garden spaces, which shape the essence of the spatial structure in the garden beyond visitors' visual imaginary. The formulation of spatial structure in the garden is related to the philosophical ideas, cultural meaning, financial issue and management system rather than visual field.

Third, it focuses on the relation between social organization and built environment rather than that between human beings and the natural landscape (Hillier and J. Hanson, 1984; Hillier, 1996). The Chinese Garden is mainly related to the regularities habited in the relation between natural world and human beings, instead of social organization. From Yuanming Tao (365-427) to Qichang Dong (1555-1636), most of the owners built the gardens in order to segregate from buzzes and noises of formal social lives and to enjoy the nature as possible as they can. In Ying Qiu's (1494-1552) painting, a scholar sitting in a chamber, was watching the mountain and stream, communicating with the flowers and bamboo trees around him and enjoying the tranquillity of county-side life.<sup>2</sup>

Last, the Chinese garden expresses personal inner feeling rather than the formal physical function and social culture. Generally, two ways are usually linked to the interaction between the environment and human being's feeling: "environmental psychology", and "depth psychology" (Dewey,1958, 16/246; Keswick, 1978, 105; also see, Thiis-Evensen, 1987, 8), the feeling and poetry in Yuyuan is extremely influenced by the second way. That is to say, the designer' emotion and poetry 'projected' onto the garden in which he lived, studied and entertained (Dewey,1958). The garden became autobiographical landscape in which most of the physical elements and organized system should stand for the character of the designer or owner (Keswick, 1978), and most of them (whatever living trees or non-living stones) have been transformed, shaped and become subjective and man-made nature. What's more, a narrative system is absolutely employed by Yuyuan to express the owners' feeling. Thus, the garden conveys the owner's feeling, poetry and meanings beyond the rational diagram of space syntax through visual experience in physical environment.

What kind of language can be used to describe the configurative poetry in system of Yuyuan?<sup>3</sup> As Aristotle(1967) wrote in the Poetics, two main factors of a plot, complex structure and deep feeling, would construct a finest tragedy. Contemporary linguists also argue that the power of narrative lies in the linkage strategy of the structure (i.e. plots), rather than in the character of objects (for example, Herman, 1999;Martin, 2005). Thus, the method of space plot could be applied to demonstrate the configurative 'poetry'<sup>4</sup> of Yuyuan to integrate the physical system with the narrative one.

### Space Plot: configurative poetry of the garden's system

#### *Embedded Stories on the Same Theme*

Pan built this garden particularly for his parents to enjoy a tranquil and happy time in their old age, and called "Yuyuan", which means peace and pleasure, is the theme (or topic) of garden-making. How can the objective be achieved? Several sub-topics can interpret the main topic simultaneously, such as Sansui Hall (harvest), Wanhua Chamber (thousands flowers), Dianchun Hall, Deyi Hall (joy), and Yuhua Hall (wealth). Although it is hard to find the original version of all these pavilions, the wonderful meaning of happiness is well demonstrated from every splendid hall and delicate subgarden with a similar subtopic, which can offer a great chance for his family and himself to enjoy it. For instance, Deyi Hall was for enjoying the beauty of the nature (e.g. the sounds of wind and water); Wanhua Chamber was for flowers and precious stones; Dianchun Hall was for local opera; Yuhua Hall was a studio (Table 1) (Shanghai Administration of Yuyuan,1999; Cheng and Wang, 2000).

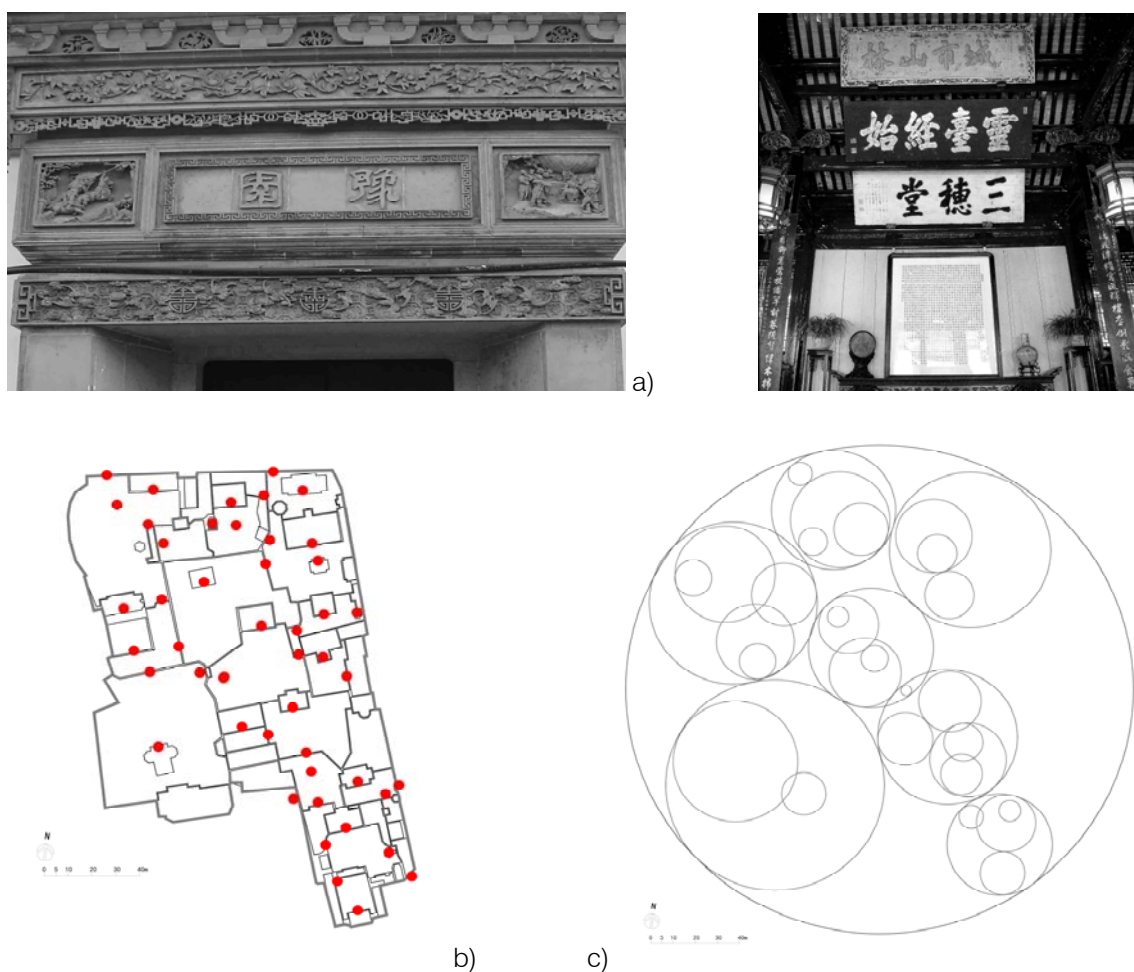
Level0	Level1	Level2	Level3	Level4	
main theme	subtopic in subgarden	Subtopic & storylines in tiny-courtyard	Stories in minicourtyard (the example of Wanhua section)	Images & Details	
Peace and Pleasure	A Sanhui (Leshou) harvest	Storyline1:harvest			
		Storyline2:long-living			
		Storyline3: domestic affairs and activities, discussed the standard of measure about agriculture(in the middle of Qing Dynasty)/ Exhibition			
	B Wanhua thousands flowers	Storyline1: Pan's parent planted the ginkgo; to appreciate flowers and stones;	B1Wanhua Chamber	Lattice with flowers' images: Plum/Orchid Bamboo/ mun	
			B1 <sup>#</sup> corridors-bamboo		
	B2 Yule Xie - the water				
	B3Yi Fang				
			Storyline2: ritual story; ceremony		
	C Dianchun spring and sunlight	Storyline1: Fairy tale; Folk music &performance; and a popular poem;	Storyline2: Revolting history of the Rebel (Xiaodao Hui ), in the middle of Qing Dynasty		
D Deyi (Huijing) joy and glory	Storyline1: to enjoy the waterscape & the whole scene	Storyline2:Story of Eight Immortals Crossing the Sea			
E Yuhua Wealth	Storyline1:as a studio	Storyline2: library and gallery(since 1909)			
		Storyline3:The historical story of the elegant rockery (Yu Ling Long)			
F Inner Garden	(local-fashioned opera)				
G Huxin-Ting	(entertainment)				
notes	Random decisions had to be made in the construction process of the garden, which are determined by the theme of the garden and situation of the site				

**Table 1**

*Narrative structure with embedded stories on the same theme*

Furthermore, every subtopic indicates stories which were depicted and developed by pavilions, courtyards, materials, details and scenarios of the subgarden (Table 1). For example, in the subgarden of Sanhui Hall (Figure 1a, Table 1), windows and doors are decorated on the main

halls with the images of rice, wheat, and vegetable, which are insignia of harvest, the subtopic of Sanhui Hall (Shanghai Administration of Yuyuan, 1999; Cheng and Wang, 2000). Another example, the subgarden of Wanhua Chamber refers to a story of an old tree. It is said that Pan's father planted the ginkgo at the front of Wanhua Chamber and he enjoyed it definitely (Cheng and Wang, 2000). Every elegant hall or pavilion in this subgarden has its own use, activities and stories which are also matched with the subtopic of 'Wanhua'. Every tiny space cell, scenic building, object and details in the subgarden represents the similar names, story, event, topic and feeling again and again. These sub-topics are derived from the main subject of the garden---'peace and pleasure'; meanwhile, they develop their own stories (Table 1), but they neither copy nor photograph, rather, they try to interpret the main theme (Keswick, 1978). Nevertheless, a leading storyline can be found in every subgarden. By doing so, the garden becomes more and more complicated in different version and dimension, while the meaning and feeling of the place would become stronger and stronger by the user and for the user. At the same time, the narrative structure with 'stories in a story' is well connected with the physical structure at different levels and dimensions of the garden (Table 1, Figure 5b, 5c, 13).



**Figure 5**

**(a)** Texts (name/couplet/poem) in the garden: name of the Yuyuan garden at the main entrance (right), Names/couplets in Sanhui Hall (left); **(b)** The distribution of text in the physical structure of the garden; **(c)**. The structure of stories in the garden: Circle 'O': theme/ topic of the a story (photograph: Shaoming Lu).

Meanwhile, four distinct relationships between stories formulate the whole structure of narrative to project onto the physical structure in the garden, e.g. the parallel topic, overlapping topic, single-embedded topic and double embedded topic. For instance, the storyline of thousands of flowers in the suborder of Wanhua Chamber is considerably independent from that of local opera in the



suborder of Dianchun Hall; while, the suborder of Deyi Hall shares a story of 'Shan Hui Chuan Mei' in a twin courtyard with Dianchun Hall. In the suborder of Dianchun hall, two paralleling plots unfold: one is connected with the performance of traditional drama; the other one is related to the story of the rebel set up by Xiaodao Hui (Table 1). The story of Jiushi Xuan, for instance, is put into the Subtopic in the section of Deyi Hall. Redundant spaces are also available for creative users (Hill, 2003): some undefined or useless spaces in the garden make it possible for users/clients to make their story and to reconfigure the garden, for instance, festival shows about folk stories are seen on the water in the section of Huxin Ting every year. Eventually, the whole structure of story-narrating in Yuyuan can be mapped onto the diagram of the physical structure (i.e. Figure 5b, c).

In this regard, the integration of narrative system and physical structure in Yuyuan not only makes it possible for the designers and owners to develop their own stories during the process of reconfiguration but also offer a great chance for visitors and users to choose and imagine. Next, what kinds of vocabulary are used to narrate these stories/meanings in the garden?

### Diverse Vocabulary Type and Placement

In the Chinese garden, people are used to describing literary allusions in the names of courtyards and buildings, in poems of "painting", and in the images of carving. In Yuyuan Garden, generally, three varied types of vocabulary, text, image and material, are employed to deliver the stories, and to connect the garden with deep feeling as an integrated whole.



**Figure 6**

*Artifacts and images in the garden telling different versions of stories about "peace and pleasure"; (a) Craft sculpture of animals on the roof; b. brick carvings of 'GuoZi Yi'; (b) The carving of peacock decorated in the window in Sanhui Hall (photographs: Shaoming Lu).*

Firstly, as Cao and Gao(1990) noted in the novel '*The Story of the Stone*', without its distinguished words or texts, the Chinese garden and pavilion could never be regarded as finished, such as names, poetic couplets, and "the appreciative poems of visitors, often written to commemorate particularly enjoyable days or elegant gatherings" (Keswick,1978, 150 ). Every pavilion in Yuyuan Garden holds its own nice name (Figure 5b), such as Tingtao Ge (pavilion compounding with the sound of water), Jiyu Shui Lang (rainy corridor), Deyue Lou in the subgarden of Yuhua Hall. The gardener also made sure most of objects and their scene in the garden worth the name during the process of construction. In Yuyuan Garden, some names of pavilion borrowed from popular

poems. The title of Deyue Lou, for instance, with the idioms of "Hao Yue Qian Li" and "Han Tian Yi Lan" comes from a famous poetry sentence.<sup>5</sup> The couplets and poem commonly are inscribed on the pillars of the pavilion (e.g., the stages in Dianchun Hall and Inner Garden), hanging on either side of the gates, or in the halls, are often written by famous calligraphers. The couplets and poems usually describe the scenario of the local scenery connecting with an imaginative vision of the related events.

Secondly, images in the pavement, windows, and on the walls or roofs elaborate vivid allegory of peace and pleasure (Figure 6a,b). A series of brick carvings of "GuoZi Yi" and Twenty-four Picture, for instance, imply the feeling of filial piety of Pan to his parent. These thoughts are conveyed from one generation to generation. Again, numerous clay/wood sculptures of deer, cranes, figures and flowers with special literary story are decorated roofs of buildings, and door-heads (Figure 5a). Plenty of ornamental images (e.g., animals and props with religious signals) are filled in middle of windows, and pavement as well.

Finally, the distinctive sounds, light, water, color and trees, change from season to season (Figure 7a, b, c, d) (Hill, 2003; Lu, 2007), attract visitors to explore meanings beyond visual images in the garden, such as human, harmony, filial, timeless and dialectic.

Although these various texts, images and materials often serve as artifacts in the garden, they show the feeling of peace and pleasure and link the objects and courtyards into meaningful complexity to the scenery of the garden in the literary way, and rehash over the time by different users at different time (Lu, 2007).

#### Non-linear Linkage of Narrative

To create inspiring and effective narrative linkages, the designer normally employs diverse strategies based on probabilities of story-telling, such as flash in or out, jump off or on, and interlude (Tschumi, 2005; Lu, 2007). For instance, nine sculptures of dragons, symbolizing immortal, are fixed up in the garden here and there. Some of them are flying on the garden walls; some are lying on the edge of a false mountain; some are hiding on the roof of a pavilion and others are riding on the gateways (Figure 7a, b, c, d). Undoubtedly, they become a thematic prop or clue in the garden.



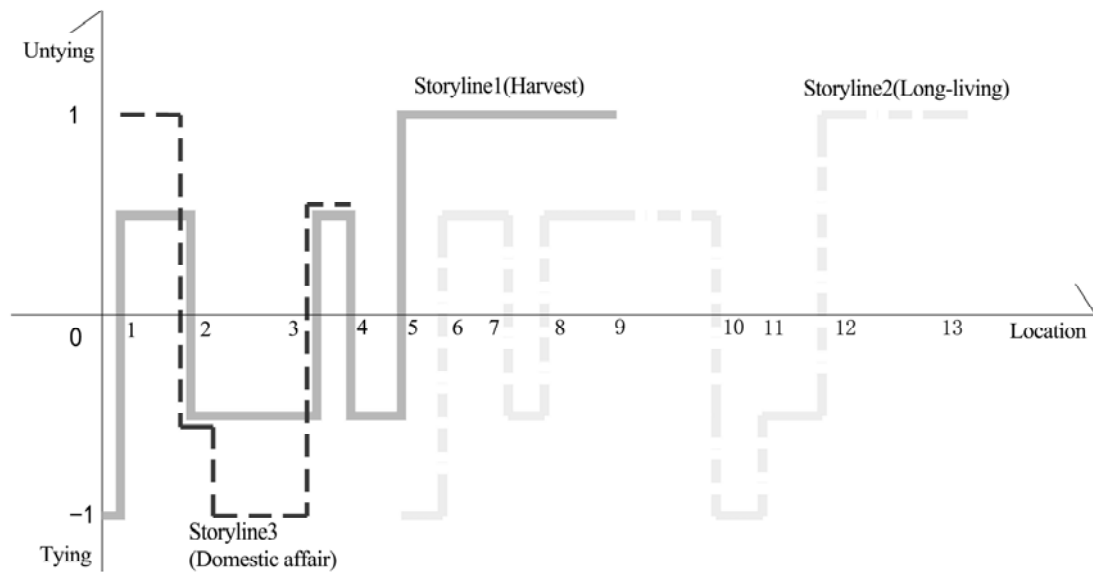
#### Figure 7

Dragon" flying in the garden; (a) in the subgarden of Dianchun Hall (summer); (b) in the subgarden of Sanhui Hall (spring); (c) in the subgarden of Yuhua Hall (fall); (d) in the subgarden of Deyi Hall (winter) (photograph: Shaoming Lu)

The storyline in the garden is above all an on-going process unfolding stories in a non-linear<sup>6</sup> order rather than exploding at one moment. Most of this narrative information would flash in and out around this detour when visitors wandering in the garden. Eventually, names of pavilion or poems of scenarios build up to the climax of the story (Lu, 2007). Without these hints at due points in advance, the deep feeling and climax would be difficult to understand. In the subgarden of Sanhui (Figure 1a, b), once again, the main topic of the storyline is 'harvest', and two embedded storylines, i.e. long-living and domestic affair, are simultaneously developing in the subgarden (Figure 8a). With regard to the topic of long-living, the storyline is quite intricate (Figure 8a, Point 5 -13). The nice corridor connecting Sanhui Hall and Wuhua Hall, called "Jian Ru Jia Jing" (Figure 8a, Points 5-10; Figure 1a), means the visitor can catch the splendid landscape at his or her own pace. The idiom could be

regarded as the tying part, while the whole corridor acts as an untying role during the process.<sup>7</sup> Unexpectedly, one elegant rockery, named "beautiful lady", is arranged in the middle of the walkway of the corridor, and cuts in on a queue suddenly"(Figure 8a, Points 7-8, Figure 8b). It might be called a suspense which embedded a story in the corridor. Definitely, it brings about an "emotional shock of surprise" with an episode. Then the corridor leads to three directions, among which is to the Wangjiang pavilion on top of the huge false mountain (Figure 8a, Point12).

During the course of the spatial choreography, the system of space plot provides the designer a flexible tool to project his complex poetry onto the physical structure, and hooks visitors' attention/ anxiety to the next scene step by step. What's more, these marvellous strategies of narrative stir up the visitor's imagination to discover the endless peace, pleasure and immortal in the garden beyond the structure (Jencks, 1978).



**Figure 8**

(a; top) Non-linear structure of storylines in the Subgarden of Sanhui Hall (1, 2, 3, 4...13: the changing-point on the main unfolding path); (b; bottom) the rock cutting into the corridor (photograph: Shaoming Lu).

### Narrative in Space Cell: content -scenario

Besides the non-linear storyline in the whole structure, narrative, rather than visual interaction, combines a space cell and its elements into a poetic scenario as a unity. The choreography of elements within it could not be ignored. An important parameters of complexity exist in a space cell is the theme of the designer, which is related to the content of a literary story closely. In another words, it is the story or poem that combines these elements together. Actually every scenic building and its scene share a poem and a story (Ji, 1988). In the subgarden of Sanhui Hall (Table 1, Figure 1a), for instance, what underpins the theme of Juan Yu Lou ('Yu', here, means rain) and its scenario is Bo Wang's (649-676) poem and story of Tengwang Ge Xu, which describes a special scene of one famous building, the weather and the mountains.<sup>8</sup> It is not difficult to find that the layout of the mountain, the water, and the pavilion in this section tends to imitate the scenario of Bo Wang's story. In addition, the poem is used to refine the construction of the scene. For instance, in the subgarden of Dianchun Hall, a space cell depicts the meaning of a poem, which can be experienced by visitors over time: The cloudy-like rockery, false mountain with endless spring, two-floor pavilion with elegant balustrade, and beautiful trees together sing out a poem.<sup>9</sup> Particularly, the content of a poem helps Cheng and his team to repair the scenario and its objects in the 1980's. Certainly, "not all meaning is verbal: the sensual and emotional aspects of garden art exist prior to and perhaps beyond words". Eventually, it becomes the context in the garden. The content of the poem provide a definitive coherence, meanings or concept to these elements in the garden. Therefore, a poem or literary story is not an ornament, but a soul of the spatial structure (Table 2).

	Element of space plot	Narrative system (meanings/feeling)	Physical system (Projected)
1	Structure	Stories on the same theme	embedded in the garden, subgardes and tiny gardens
2	Generator	Content of a poem or a story	Scenario in a space cell
3	Vocabulary	Text/name/poem/couplet, image, material	Lie on the node-edge-path
4	Linkage strategies	Flash in or out/ cut in within/between storylines Non-linear orders(tying /untying)	Overlap at different levels, e.g. spatial structure, circulation and waterway system.
5	Relative Discipline	Linguistics:	Geometry:

**Table 2**

*Space plot as a language of Yuyuan garden*

Of course, the system of space plot is mostly supported by the spatial/ narrative structure and these elements. The irregular physical structure provides sufficiently numerous and flexible routes and leads to a sequence of stories/events, which offers huge possibilities for the narrator to employ the marvellous strategies and register in deep feeling beyond the need to identify the garden (Hunt, 2000). On the other hand, the narrative system is not simply a reflection of the geometric/ physical system, but not can it be independent of it. What's more, the topics and poetry guide the designer to create, refine and organize the spaces and their elements, and non-linear storylines enable the designer to develop, re-edit and reorganize the spatial structure and its objects. At the left of the courtyard of Wanhua, for instance, a narrow space cell B1<sup>ii</sup> is enclosed by zigzag corridor and white wall (Table 1, Figure 1a). Small as it is and no accessible walk ways, it is filled with green bamboos and vegetable (i.e. pleasure with thousands followers), which not only resonates with the subtopic of Wanhua Hall "thousands of flowers", but also reinforces the main topic of the Yuyuan garden "pleasure". Furthermore, these lattices of Wanhua Chamber are adorned with images of flowers and plants, such as plum blossom, orchid, bamboo, and chrysanthemum (Table 1, Figure 1a), which highly represent the subtopic again. The theme of the garden becomes a thread in the constructive process as well as in the cognitive one. Without the stories and narrative rhetoric, the physical structure would be discursive, the reconfiguration of the garden would be out of control, and the garden might lose the great sense of poetic coherence, deep feeling and elevated thought.

Therefore, the poetry of the garden could be explored in the configurative process, i.e. the narrative/physical structure, vocabulary, linking strategies, contents and contexts, which formulate the spatial language of the garden--space plot (Table 2).

## Conclusion:

Space syntax is unsuitable to examine the meaning and feeling in the Chinese garden owing to four main limitations within a social dimension, although it could examine the cognitive complexity in the garden to some extent. In contrast, space plot demonstrates considerably the essence of structure both in the syntactic sense and semantic way. This new language of the garden space, through vocabulary, linkage, content and structure, offers an effective approach to linking the physical system with its poetry during the formulating process as well as the cognitive process (Table 2). In Yuyuan Garden, the visitor does not remain a cold spectator and is carried forward, "not by a restless desire to arrive at the final solution, but by the pleasure activity of the journey itself"(Dewey, 1958, 5). This is mainly due to the configurative poetry of the garden-space plot.

Of course, every language has its own context. When and where could this new language of the garden's space be applied? What kind of philosophical ideas are related with it? Those should be clarified in the future.

## Acknowledgements

Special acknowledgement goes to Iain Borden, Jonathan Hill, Michael Batty, Bill Hillier, C.J. Lim and Colin Fournier.

## Notes

- 1 The section of Huxin Ting, belonging to the garden of Yuyuan, is the annexation of the main garden. It is completely open to the public now.
- 2 Yuanming Tao was an official, literati in Jin Dynasty; Qichang Dong was also an official, painter in Ming Dynasty; Ying Qiu, a painter in Ming Dynasty, particularly focused on the theme of historical figures and events in his works. During the Ming Dynasty (1368-1644) and Qing Dynasty (1644-1911), some wealthy families and retired officials moved to Shanghai and built private gardens there, one of which is Yuyuan Garden. Besides, Gu Yi Garden, ZuiBai Chi Garden, Qu Shui Garden and QiuXia Pu Garden, also enjoy high reputations of the title of national cultural relics.
- 3 Although Jun Tong, Chongzhou Cheng and Xuke Chen deciphered the metaphysical meaning of objects, context of the gardens, tectonic language of the physical form and strategies of sequential spaces in a way of inter-disciplinary research, they normally focused on poetry of the objects-making or parts of the garden rather than the whole poetic network. Little evidence showed that they connected the narrative system and the physical structure in the garden. See, for example, Chongzhou Cheng, *Talk about Garden* (Jinan: Shandong Pictorial Publishing House, 2002); Jun Tong, *Glimpses of Gardens in Eastern China* (Beijing: China Architecture and Building Press, 1997).
- 4 According to *The Oxford English Dictionary*, here "poetry" mainly means the expression of elevated thought and deep feeling, "adapted to stir the imagination and emotions, both immediately and also through the harmonic suggestions latent in or implied by the words", materials, images and their scenario actually used. Certainly, 'poetry' in Yuyuan Garden is embodied within the dimension of literature rather than aesthetics, such as, in semantic linkage rather than visual relation, which is conveyed by stories, poems, names, images, materials, activities, and narrative structure in the garden. Various source, see, J. A. Simpson and E. S. C. Weiner, *The Oxford English Dictionary*. 2nd eds.(Oxford:Clarendon Press, 1989), 1120.
- 5 Xuke Cheng and Tao Wang, *The History of Garden in Shanghai*. (Shanghai: Shanghai Academy of Social Science Press.2000), 266. The poem is called, in Chinese, "近水楼台先得月".
- 6 Non-linear normally covers two points: one means a story without storyline with an open beginning/end; the other refers to an irregular order of the storyline. Here, this essay emphasizes the later meaning: different storylines with an irregular order overlap with each other.
- 7 In terms of the definition of tying and untying, see, for example, Aristotle (384-322 BC), *Poetics*. Translated by Gerald F. Else, (Ann Arbo: The University of Michigan Press, 1967), 49.
- 8 Bo Wang (649-676), Chinese poet in Tang Dynasty, the author of the poem *Tengwang Ge Xu 滕王阁序*. The sentence described in the essay is called, in Chinese, "珠帘暮卷西山雨", which comes from his poem.
- 9 Cheng and Wang (2000), *op.cit.*, 265. The poem is called, in Chinese, "花木阴翳, 虚槛对引, 泉水萦洄, 精庐数楹, 流连不尽".

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