

# A Study on Systematic Interface Formed from Composition of Architectural Space

YU Min

CITIC Qianhai (Shenzhen) Investment Co., Ltd., Shenzhen, 518001, China

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**Abstract:** This paper is about the study on systematic interface formed from composition of architectural space from three aspects, intermediary material representation of interface, systematic expressions of interface semiotics and improvisation of interface design. Rational utilization of the mutual interdependence of construction factors of spatial interface is proposed for effective enclosure, limitation, guidance and organization. This is beneficial in realizing the ordered combination of multilevel space, so that the changes and development of space can be conducted in an orderly manner under the organization of various interface elements. This can also avoid the one-sided subjectivity of “either this or that” in the train of thoughts of composing, to form a holistic comprehension towards spatial configuration.

**Keywords:** Spatial configuration; intermediary material representation; interface semiotic system; interface design

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## Introduction

Functioning as an intermediary material representation of spatial configuration, the interface commonly presents as the limiting and directing dialectical unity relationship of the form and structure of spatial interface, which directly impacts and<sup>1</sup> influences the visual thinking, psychological feelings and behavioural actions of humans in realization of concrete architecture creation. Conducting systematic interface research on the formation of architecture spatial configuration, and rationally utilizing the relative relationship of factors forming spatial interface which effectively enclose, constrain, direct and organize, is beneficial in realizing a systematic combination of multi-level space so that the alteration and development of space can proceed under the organized system of various interface elements in an orderly manner. This can also avoid subjective one-sidedness of “either this or that” in train of thoughts in composing or to avoid sole consideration of one or a few aspects. Hence preventing the negligence of a holistic approach in understanding the overall formation of spatial configuration.

## 1. Interface as the intermediary material representation of the formation of spatial configuration

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The study of interface is a subject that encompasses a wide scope. As an intermediary material representation of spatial configuration, it encompasses a large amount of contents, as little as a product and as huge as a building's façade, and even the interface of a whole city. Systematic dialectical knowing the historical development of Chinese and Western architecture and the cultural background of Eastern and Western thinking from the perspective of spatial interface enable us to gain an in-depth comprehension towards the art of eastern and western architecture from the intermediary association of contradiction space or the intermediate level or stage in the formation of spatial configuration, to further feel the spiritual, ideological and aesthetical enlightenment brought by different cultures.

### 1.1 The historical development of traditional spatial interface architecture in China

The traditional architectural space in China conforms to the nature, the conformity of spatial interface and nature and their fusion into one. Most of them employed a common design with great flexibility, commonly having these three characteristics. Firstly, spatial interface homogeneity of the interior and exterior of architecture, the infiltration and integration of the building and courtyard forming a virtual and concrete homogeneous space, and to show the expressiveness of a certain architecture by its limited homogenous spatial interface. Secondly, special attention is given to the harmonious integration of spatial interface and nature, which is influenced by the concept of "integration of heaven and human" and advocating nature, naturalization of handling spatial interface, is one of the main characteristics in traditional architecture of China. Thirdly, is the randomness of interface configuration, different from the geometrical composition of western classical architecture layout. Traditional architecture of China, especially the courtyard architecture, its interface configuration is based on topography conditions, operational requirement, especially the aesthetical ideology of advocating nature, the continuous alteration of sequential axes, random and varied spatial configuration, this interface configuration derived from nature makes the marked difference from the obstinate and regular spatial expression of western classical architecture.

### 1.2 The historical development of western architecture spatial interface

The western classical architecture is influenced by the opposing duality philosophical thinking that man has to combat with nature and men needs to conquer the nature. Load-bearing wall of the form of interface that once distinctly separated in- and out-doors naturally became the classical form of representation of western traditional architecture space. With the arrival of Industrial Revolution in the early twentieth century, the continuous development of new techniques and materials freed the classical space, enabling the architecture space to thoroughly extricate the burdensome interface structure and sophisticated interface decoration, into becoming elegant and graceful flowing space. The multi-directional interface of space once again kept away from unifying and interweaving, and flow became the main designing concept for better creation of modern spatial configuration. Men began to enter into the interiors to experience the sense of space rather than appreciating the carvings at the exterior of architectures, this seems to be comparatively more similar with the concept and principle of China's classical architectural space. Framing and structure are one of the main common characteristic, the interaction of everything between interior and exterior can proceed from this.

## 2. Systematic expression interface symbol spatial configuration

The propagation of spatial messages is mainly realized via the systematic expression of interface semiotics. The construction of architecture spatial configuration is the most optimized message and answer between the originality and comprehensibility of meaning of interface elemental message. Interface semiotics, as materialized interface elements, naturally played the role of dissemination media of elemental message of interface. The architecture culture is strongly

localized and historic, the architectural space of different periods became the distribution center of various interface semiotics and their significance.

## 2.1 Semiotics and interface semiotic system

Semiotics is a systematic science which studies semiotic structure system and its inherent pattern, its usage in various aspects of societal life can successfully reveal its inherent in-depth content. Space interface is not only a form of existence, it is meaningful and carries a large amount of messages, able to serve as the intermediary medium to express the meaning of space. Using semiotics in the analysis of space interface is to introduce the methodology of semiotics towards the meaning represented by interface image, to study dialectically interface semiotics including messages and the relationship between interface and man and others.

Similar to languages, the propagation of spatial messages is a lot, complicated, multivariate and multilevel in interface semiotics. Only through operations in structure and including it into the propagation system, the interface semiotic system is then able to form the holistic and integration of the structure of propagation system, to subsequently deduce meaning from meaningless. Propagation of spatial messages is able to be received more completely. Interface semiotic system integrated the process of interaction of the interface elemental messages between man and spatial environment in the knowledge of man towards space, made it a combination of reality and abstract.

## 2.2 Ambiguity of interface semiotic system

In the concrete spatial environment, the conventional definition of interface semiotics is interface elemental messages between man and space, being the essential prerequisite to be able to propagate. But the meaning of various structures interface semiotic system does not necessary corresponds completely. In this significance, main characteristic of propagation of interface elemental messages is its medium ambiguity. this ambiguity in interface semiotic system are commonly manifested in form versus spirit, emotions versus rationality, and a series of coexisting interface elements with opposing duality.

### 2.2.1 Form versus spirit

The inherent spirit and the existence of external appearance of spatial configuration having the relationship of mutual interdependent and dialectical unity. The “spirit” is often perceived by man through a certain “form”, its spirit have to be expressed through its form. Anyhow a deep comprehension towards spirit is needed in the expression of form, and also skilful mastery of the pattern of construction of spatial configuration, able to capture and express the spirit. From the perspective the propagation of interface elemental messages, which is the integration of concrete configuration and symbolism of interface semiotic system in the propagation process of messages. Due to the multivariate and multi-meaning of the content and form of interface semiotics, its structural system is often used in manifesting certain wide and deep symbolic meaning. For example, Temple of Heaven of Beijing, the interior and exterior of the altar adopted the shapes of sphere and square respectively to present a specific target of worship in space. Hence the overall spatial layout uses the organizational structure of sphere and square level interface semiotics system symbolizes dome-shaped heaven and square earth, and then fully limits the existing space while proactively created imaginary space.

### 2.2.2 Emotions versus rationality

So-called “emotions” and “rationality” are the harmonious coexistence of the emotional and rational factors in comprehending and experiencing space of interface semiotic system. The interface elements function as separation and communication of space, and possess the characteristic which emotion and rationality are of equal importance. For instance, Corbusier successfully adopted the interface semiotics designing technique of metaphorology in building Ronchamp Chapel of France. The architecture’s image of outward appearance are multiple abstract mysterious metaphoric, and fulfilled the requirements of internal operational function. In common practice, functional

representation pursues the proportional relationship of numbers in compositions, emphasizes creation of atmosphere; while emotions focus on localized adoption and liberal layout, focuses in conforming, emphasizes on manifesting the spiritual needs of men's inner world. Due to the fact that interface semiotic system is inclusive, these two factors are not independent, but can be integrated to construct an interfingering, complex and varied spatial configuration, reflecting the balance and harmony of emotions and rationality of behaviour psychology.

### **3. Enhancement of the composition of spatial configuration of interface**

#### **design**

Usually the perception, knowledge and experience of Man towards space, what they directly see and feel is the physical interface. Different configuration and structure of spatial interface can create different scenic spatial atmosphere, making the overall image of spatial environment becomes an integrative art representation of the collective effect of various interface medium configuration. Hence, skilful utilization and control of the form and style of interface design is the key part in constructing architecture spatial configuration.

#### **3.1 Enclosure and limitations of space**

The extent of enclosure and limitation of space differs with different type of interface, establishing relationships in accordance to various abstract and concrete of interface, can further divide into explicit interface and implicit interface. At the same time, interface acting as the object of perception of visual phenomenon, reflects an overall spatial image in Man's perception. The combination and interchange of abstract and concrete of interface will influence the overall construction of space and produce corresponding changes of spatial configuration. The lacking of overall utilization of these interface construction factors should be avoided in construction of spatial configuration, while the disintegration and reconstruction of interface as a kind of intermediary thinking of spatial designing concept and designing technique are very effective.

##### **3.1.1 Explicit interface and implicit interface**

The explicit interface is a specific form of physical interface, it is the material representation of spatial medium, and also the result of collective effect of Man and surrounding environment; is a material form created by spatial requirement of Man. In correspondence to this, in the process of knowing space, the space interface between explicit substances is constructed using the filling of human psychology. This is psychology separation of objective interface on space construction; this subjective image of interface is implicit interface. The combination of explicit interface and implicit interface promotes interaction between space, resulting in flowing of space, and separation of space effect, for example the grey area formed by the extending canopy of architectures, grey area formed by various enclosing colonnade and others. In a physical space, the more the spatial territories defined by implicit interface, the extent of complexity of spatial configuration is greater, and more levels.

##### **3.1.2 The combination and interchange of abstract and concrete of interface**

In the experience of overall spatial environment, the "figure-ground analysis" constructed via in between the realistic and virtual forms of space interface, can simplify the structure and sequence of space, hence enabling space to be formed completely. The principle relationship between figure and background is based on the perceptual grouping of Gestalt psychology. When observation of shape and environment, the selected object is often the object of perception, while the blurred object is the background of this target. Lacking of discernment of figure and ground of interface in spatial environment could cause pessimistic visual effect. For instance, the historic "tai chi" symbol of China have expressed the mutual interdependence and coexistence of figure and background by dialectical interchange of "yin-yang" in the early days. This is a classic example that includes enclosure, correspondence, similarity and significance. This technique of combining and interchanging the virtual and reality of interface specially extricate the

limitation of the load-bearing structure and hence can be freely unleashed. This resultant multilevel interface provided more construction methods of spatial configuration to men.

### 3.1.3 The disintegration and reconstruction of interface

The decomposition of interface here refers to destroying the previous relationships constructed between structures of initial space interface, or certain internal structures, so that various spatial conflicts and conflict characteristics of various aspects can be revealed, to understand and know thoroughly the characteristics of existing conflicts of certain space. On the other hand, reconstruction of interface is on the basis of to comprehend thoroughly the nature of various spatial conflicts, conduct restructuring based on objective realistic needs and subjective consciousness of man. This is to regain a new balance from the conflicts exposed from disintegration. Bruno Zevi summarize this kind of way of thinking as “four dimensional decomposition” in the book “The modern language of architecture”, as one of the seven principles of language in modern architecture [9]. For instance, Wright uses the decomposition of interface, breaking the initial acute spatial system in the design of Fallingwater House, resulting in the function and usage of interface are not only to enclose and separate, but to create organic relationship of overall spatial configuration.

### 3.2 The deduction and organization of space

Sequential spatial organization is a way of combination in constructing main axes of various spatial interface. By deducing and organizing various factors of interface construction, a series of spatial level and sequence is formed. These factors of interface construction connecting one area with the other in different forms, emphasize on the moving direction of goal, leading Man to enter from space into another space, and provided a basic behavioural mode of activities of Man in spatial environment. Utilizing this interface designing technique is mainly supported by psychological needs and spiritual expectations of Man towards different space, hence organize Man to explore the nodal and climax parts of sequential space.

#### 3.2.1 The axial instructions of interface

The goal axis of interface at some point, implies the difference of space either strongly or weakly. The axial instructions of interface can be fully utilized to form the directionality of spatial sequence. This is often formed through main axial instructions constructed by multilevel interface; different spatial sequence corresponds to different circumstances, different circumstances also have to correspond to different spatial sequence. For example, the organization of spatial interface of classical garden landscape includes concepts like meandering paths leading to secluded places, deep courtyard with little yard to express corresponding spatial sequence, which are continuous winding, and twists and turns. The organization of spatial interface of China’s ancient palace follows strictly the sequence of etiquette set such as priority in rank, and inside and outside. Its arrangement of spatial sequence commonly emphasizes on the symmetry of medial axes.

#### 3.2.2 The orderly separation of interface

The orderly separation of interface is able to express the organized distribution of sequential space, the form of separation decides the extent of connection of space, while the methods of separation is to create the aesthetic, emotions and artistic concepts of spatial form based on the fulfilment of different separation requirements. The rhythm and melody of spatial sequence are formed in the separation process which is rich with changes and possessing internal unity. Its focus of attention is commonly on the reasoning and sequence of organization process of spatial environment. The rhythm referred herein mainly refers to the four aspects of sequential space, namely introduction, continuation, transition and summary. These spatial elements, be it open or closed, will produce different spatial concepts, like sealed and open, long and narrow versus open and wide, ordinary and noble. The layout of architectural space interface of the Forbidden City in Beijing is a classic example of such sequential rhyme. The basis of most of the main layouts can be found in the “Rites of Zhou”.

#### 3.2.3 The transition joint of interface

The sense of infiltration is related content with sequential spatial form. Infiltration leaves a dynamic impression to people, while the concept of dynamic and static are contradicting. A closed space gives the impression of static and immobile, at this point of time the changes between sequences are manifested as changing of multiple scenario interface. A corresponding status refers to incomplete enclosure, a relatively more open spatial configuration, enables the possibility of mobility between sequences, forming the infiltration and communication between spaces. No matter the spatial unit is dynamic or static, the transition joint between spaces is the key to sequential interchange; this is usually completed by the interface transition between sequential spaces. Like the system of door-hall in the layout of China's ancient architectures, emphasizes a door to every hall and a door to every courtyard. The form of door's interface represents the transition joint of transition session between a sequential space and another sequential space. In other words, every door represents the beginning of a sequential space or the end of the preceding sequential space.

#### 3.2.4 The extent and control of interface

The contradiction between man and space are often manifested through their characteristic vague boundaries, and hence effective quantitative control is needed. Interface is able to function as guide and transition, and also a crucial controlling function of sense of scale towards sequential space. Commonly the studies on sense of scale towards sequential space mainly completed through geometric proportional relationship and scale's visual control of spatial interface. The goal of quantitative studies like body proportions and numerical relationship is to mainly emphasize on the scale and proportion of spatial interface. In the western architectural history, it is deemed that the visual fulfilment of a certain scale and proportional relationship the standard of aesthetic, this made the golden ratio into becoming the classic designing technique. While the framing technique of ancient garden landscape of China control the interface scale of sequential interface visually and its corresponding location and shape through the choice of specific viewpoint and certain framing. This presents the artistic taste and realm of architecture spatial form.

## Conclusion

In the process of space creation, when the spatial language in describing the image of architecture is changed to concrete main elements, interface changes the abstract design concept into a concrete presentation form, hence forming a functional and symbolic meaningful spatial configuration environment. It is the expressions of meaning of architecture thinking of this genius loci that the spatial interface enters into the psychological territory and emotional world of man. Although an existence in an explicit form is manifested in direct perception, its essence is the implicit form of materialized carrier of society, economy, politics, technology and culture. It is the result of joint effects of various influencing factors. No matter how will space develop and evolve in the future, fully fulfills the continuity, sense of enclosure, sense of discrimination and sense of variety and every other aspects of realistic requirements, is the common goal to achieve in people-oriented humanization principle. Objectively requires us to fully utilize continuous, separation, high and low, abstract and concrete, soft and hard, texture, light and shadow, colour and multiple interface presentation form to construct a proactive, multilevel space configuration and structure. Henceforth creating an integrated and ordered, limpid and touching material spatial environment and humanist spatial environment.

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