Architectural Homeostasis through Reciprocal Dualism

dotT Based on Projects by dotA (Qiang Chang | Yan Gao | Ning Duo)
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Architecture is a discipline that can be re-written and re-interpreted differently depending on the conditions of its time. It needs both evolution and revolution. Architectural practitioners and scholars have never stop upgrading or updating the thinking of architecture. Most –isms so far, have always begun with destabilizing the old in order to establish the new. Architecture reacts to the reality slowly and acts on the reality eventually. It learns from the new reality earlier, but often ignores the reality later for the sake of experimenting utopian ideologies inside the ivory tower. It is perhaps, the most volatile discipline compared with many others, e.g. physics, medicine, business, law, math, etc. It is autonomous, yet also constrained by many external factors and invisible forces. Architectural debates have never ceased. But all reach settlement eventually until different voices break out.

Architectural Homeostasis describes the properties of architecture according to the characteristics above. Homeostasis was initially defined by Claude Bernard and later by Walter Bradford Cannon, which is the property of a system, either open or closed, that regulates its internal environment and tends to maintain a stable, constant condition. Multiple dynamic equilibrium adjustment and regulation mechanisms make homeostasis possible . It doesn't mean a constant stability, rather the interaction between flux and stability until a new balance is achieved in long term. It doesn't discourage changes, which indeed leads to a higher degree of stability. Homeostasis is the philosophy for organism. Architecture is not organism. But alike organism, architecture shares a number of properties as the result of writing, thinking and making architecture. What makes homeostasis possible to architecture is the synthesis of multi-negotiation between two opposites within the architectural discipline, e.g. paradox and conciliation with architecture, complexity and simplicity around architecture, contradiction and consistency of architecture, preciseness and uncertainty to architecture, and so on.

The path to homeostasis is through Reciprocal Dualism, the state of contrast to create distinguishable duality, upon which the individual identity depends. It involves the process of feedback loops and double codifications (encode & decode), through which opposing forces do not counterwork to weaken one another, but instead, interplay reciprocally to promote stabilization, i.e. homeostasis, similar to what Robert Venturi has ever called "Equilibrium, which must be created out of opposites. Such inner peace as men gain must represent a tension among contradictions and uncertainties. . . ."

Our design philosophy is architectural homeostasis, which evolves architectural organizations that could be engineered into irreducible constructions. Our agenda for practice is to develop a kind of architecture that emerges from the game of deterministic concepts and informative operations. This approach channels the two opposing design methodologies:

the implicit global descriptions and the explicit local inscriptions. The unfolds of Reciprocal Duality can be reflected upon the clarification of a series of seemingly opposite words in conjunction with our practice.

Subjectivity and Objectivity

One of the most fundamental opposites within architectural discipline is the conciliation between subjectivity and objectivity. The journey of design runs through the synthesis of complexity and multiplicity. Architecture could be understood as the medium that mediates subjectivity and objectivity instead of being the ultimate object independent from human initiatives (fig 1). This becomes even more evident during globalization and rapid growth in the developing countries such as China, where architecture has mutated into Consuming Product, Political Icon, Financial Device, Corruption Means, Media Hype, Social Status, etc. Architecture should neither surrender to these mutated architectural beings, nor neglect their existence with a supreme gesture. Instead, she should learn how to co-exist with them or even convert them, evolving to be new kinds of beings. The values of Architecture in Information Era must be different from those in old days. So do criteria when initiatives have changed, conditions are different and, tools are far more advanced.

Top-down and Bottom-up

Project: BOW, REPEAT digital fabrication competition by tex-fab, 2010

How to transcend the limit of subjectivity in design which relies on prescribed images out of empirical visual references, in another word, to diminish the inertia of style? We need to balance sensation and computation.

One of the rudiment nature of human being is creativity, or, the intention to be different from others in order to identify the presence of individuality. The journey of creativity always starts from learning by mimicking. Creativity should be evaluated in association with Novelty, Resolution and Style . The most challenging part for a practice is, perhaps, Novelty. How to break the inertia of individual preferred styles?

The Top-down approach acknowledges conceptual sketches at the beginning and determines design results extensively. The situation changes when the Bottom-up approach became possible as the consequence of Computation. However, the development of Computational Design in the past decade or so is hitting the Wall. It encounters the same problems as Modernism, i.e. universality and obsession of making objects.

Our approach of practicing computational design is the mediation of Top-down decisions and Bottom-up executions. The boundary between subjectivity and objectivity could be diluted effectively.

BOW is a pavilion generated by the adaptation of local connections rather than by the shape of components. The top-down approach is that 3 elliptical curves intersect as the result of cutting 3 cylinders (extruded from the min/max circular constrains of the site) with rotating planes according to orienta-

tion, accessibility, visuality, as well as component assembling logic, to form a system of 3 grid-type twisty-surface beams supporting each other to ensure the overall structural stability. The height of the beam reduces the stress of overall bending. The global decisions are mostly made according to the properties of local connections for bottom-up approach, which was initiated for the stiffness and overall strength of laminated materials to create a pre-stressed structural unit, which can resist stresses to keep the whole structure integrity. By changing the width of the bended aluminum sheets to fit the surface curvature locally, multiple continuous folded 3d twisting surfaces are achieved globally. BOW is a complex 3D assembly made out of simple 2D-based components by the design intelligence rather than the machine intelligence.

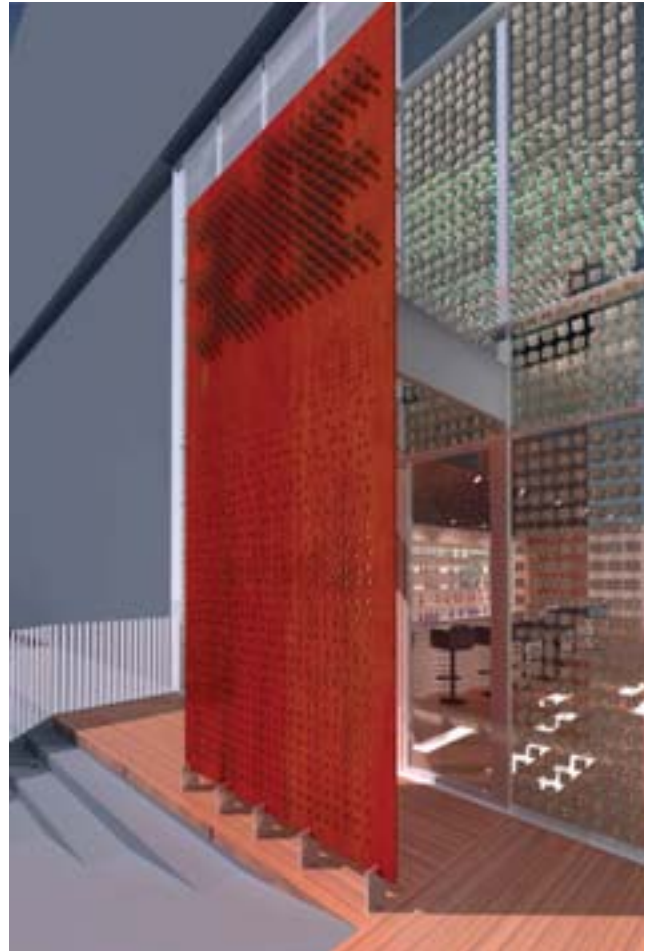### From Function and Form to System and Effect

Project: Real Vino, Spanish Red Wine Bar, Beijing, 2011

What is the alternative of function and form if they are not valid any longer in the fast changing time?

From "Form follows Function", to "Function follows Form", or "Form defines Function", or "Form is Function", all the statements are based on the fact that Form and Function is the intrinsic of architecture.

Form can be understood as the visible appearance, shape, or configuration of an object described by physical materials. What if it is not an object but other beings? What if it cannot be presented with any physical materials? Now comes Function. Max Bill has written an essay called Function and Gestalt in 1958, in which he understood function as the relation between a minimum of two variables that are dependent on each other. He distinguished two different groups of functions. The first one reveals the relations between the object and people as individuals. The second one reveals the relations between the components that make up the object and the process-
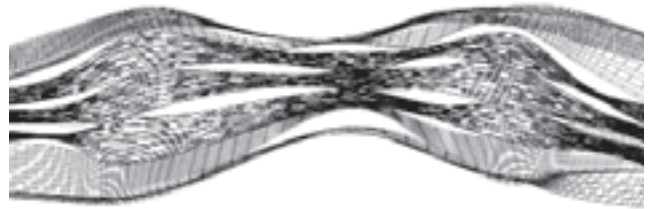
es by which it is produced. Form arises as the harmonious expression of the sum of all functions.

First of all, I would like to extend the first group of functions to the relations between subjectivity and objectivity.
Secondly, what is still valid today is understanding function as relations, so does form. Today, when functions are flexible and changeable, when form is increasingly complex as consequence of the new type of urban conditions and many other issues, what will be the alternative intrinsic of architecture? I would propose System and Effect, the former reflects relationships and mechanisms forming an integrated whole, the latter indicates artificial results of architectural operations, which should not be limited to visual consequences.

Real Vino Bar was inspired by the concept of a system for red wine bottles with the intention of maximizing possible relationships with other elements inside the bar. The system was initiated from the ways of storing wine bottles. We designed a perforated panel system which set up an interesting relationship between the sizes of apertures and the profile of bottles. As a result, this system creates a field topography defined by the displacement of bottles, which further denotes a genuine constellation effect when light refracts through and reflects on the curvy glasses of the bottles. Furthermore, this system also incorporates acoustic functions as well as the sign of Spain (we used Spanish geography map to determine the perforation). For the façade, the existing structure has to be preserved. Therefore we created another curtain system made out of strings of corks, the positive and soft "circles" in contrast to

the negative and hard "circles" of the perforated steel panels, generating a dynamic soft-screen effect while moving against wind. The lower floor emphasized on the bar system, which was organized according to the drinking behavior at bar tables, and the system of timber modules which integrates functions of dis-
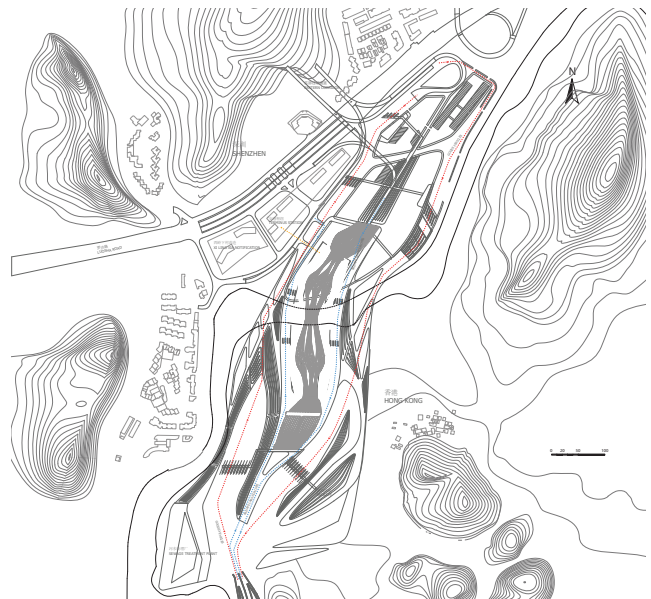

play, acoustic and lighting.

Description and Inscription

How to streamline a smooth connection between two separated parts while distinguishing the identity of each side?
The concept of ATI was inspired by the intrinsic quality of Chinese Calligraphy, which is a perfect example of reciprocal dualism for description and inscription. Described by Zong Baihua, an Aesthetics of Chinese Calligraphy, "Variations in density of composition, light and heavy strokes, slow and fast brushwork all affect form and content. It is like

a whole. Based upon this interpretation, the crossing facilities were inscribed as a collection of multiple strokes, each of which is classified into different movement (the Still Strokes for Office, the Slow Strokes for Passenger Crossing and, the Fast Strokes for Vehicle Crossing) to describe the concepts, which is manifested through the following three aspects.

Connection and Division

There are lots of territorial divisions that need to be physically connected while keeping their own identities. For many, crossing a border has become a daily event from the experience of once a year or even once a life as it was before. A functional connection cross the border needs to be replaced by more significant architectural link, a smooth transition with identifiable characteristics for either side. A discontinuous continuum is the experiential effect we aim to achieve in ATI Project.

The key idea is the emphasis on the connection between passengers and surrounding environment to re-establish the perception of the spatial change through time, instead of concealing all the movement into a well enclosed extrusion as the current Border Crossing Buildings typology. Thus, architectural form (the representation of objectivity) becomes the medium to bridge individual perception (the representation of subjectivity) with surrounding nature. Three methods are used to re-establish the connection: Firstly we squeezed the accommodation of offices above the Passenger Crossing to either side of the building in order to bring roof light into the deep plan. Secondly, through strategic twisting, a series of evolving sections peer off to introduce slits on

picking out notes from the myriad sounds of nature in musical or artistic creations, developing laws of combining those notes, and using variations in volume, pitch, rhythm, and melody to express images in nature and society and the feelings in one's heart." It immerses subjective feel into the objective presence of ink and void on paper through movement in time and space. The quality of Chinese Calligraphy is the negotiation between the positive shape - dark ink, and the negative space – empty void. The emotion is inscribed into the movement of brush and hand onto a blank paper, then described by the calligraphy as

the first floor, so that the wrapped ground floor has direct connection to sky as well. Lastly, some of the massing in-between the office frames is populated with greeneries.

Time vs. Space

Baruch Spinoza rejected the distinction between space and time with the belief that for God such a distinction was meaningless. "The illusion that a thing called time existed was the result of mankind having made the thing called space independent" . Instead of contradicting against each other, time and space are never separated in Universe, as for human the experience of moving through space bridges perception of time with the substance around. Speed of movement echoes the reciprocal dualism of space and time.

The changing speed of movement during the whole border-crossing experience follows the pattern of fast (near the entrance), slow (near the queue for departure customs), fast (crossing the river), slow (near arrival customs) and, fast (near the exit). Such pattern is inscribed into a formation process for the generation of the sectional series by intersecting the strokes with plans that are arrayed in differentiated spacing and rotating angles. Herein, the formal operation is the incarnation of speed of movement. Time melts into space.

Natural Artifact vs. Artificial Nature

The site is at the border where the Hong Kong side is mainly rural nature and the Shen Zhen side is mainly artificial urban. How to merge these dichotomy
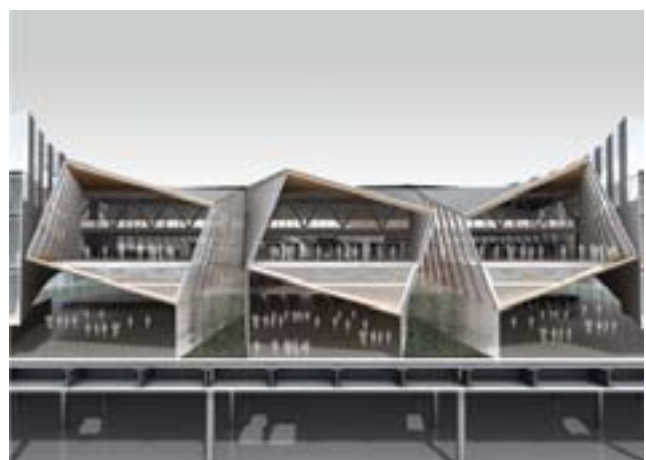
characteristics into one entity? We proposed a green network as the extension of the podium to organize staff circulation and vehicle flow, as well as greenery and water recycle system along the crossing trajectory, i.e. Artificial Nature. On the other hand, the Main BCP Building with simple outer boundaries while complex inner boundaries, strikes cross the border as one porous strand torn apart to absorb the surrounding nature into the building, i.e. Natural Artifact.

Sustainability and Development

Project: Leisure and Cultural Complex, Kai Li City, Gui Zhou Province, 2010

How to, within a given short period of time, achieve the equal quality of collective buildings as those which evolve through a long time? Or in a sim-

ple version, how to customize and automate non-standard design products according to complex site topography in multiple folds?

Economic development has become the irresistible force sweeping all over China. Internationalism clashes into Regionalism. The tension between cities and villages intensifies at suburbs. How to sustain the culture merits which are beneficial to the local majority, meanwhile favoring the political and commercial interests of the local minorities, is one of our focuses. The lack of the sustainability of the original inhabitant environment is because, as we believe, essentially the rapid speed of development. Consequently, in order to meet the deadline, it has to erase the architectural diversity and adaptability, which can be only achieved through the evolution after a long time before computational design. Can we design out one-off developments with the same sustainable qualities as the vernacular residential atmosphere? Intelligent computation in line with subjective design interference makes it possible.

Instead of taking for granted the conventional way of doing master plan from 2D, Kaili Project transcended this inertia with a new way of 3d planning, i.e. computing the gradients of the site topography locally for the most appropriate building platforms which then generate individual houses with the vernacular style. We explored the techniques for intelligent massing in real time. As a result, no single house is identical and all suit the topography perfectly. According to the design brief, a series of evolutionary design strategies were made to further teeth out both the buildings in different shapes and in-between public spaces in various scales on top of the massing

outcomes. A massive, automated and valid customization conveys collective buildings with the similar quality of the local architectural typology, i.e. both genuine and diversified, sustainable in the cultural and economic dimensions beyond the ecological dimension.

Both … And…

I would like to quote Robert Venturi's words in his early book Complexity and Contradiction in Architecture to start the end of this essay: "I am for richness of meaning rather than clarity of meaning; for the implicit function as well as the explicit function. I prefer "both-and" to "either-or," black and white, and sometimes gray, to black or white. A valid architecture evokes many levels of meaning and combinations of focus: its space and its elements become readable and Workable in several ways at once."

"Both…And…" reflects the dualism in architecture, but not yet reciprocal dualism, which needs some chemical reactions, i.e. effective architectural operations, between the two opposites instead of accepting the initial status of the opposites, within and beyond the scope of architecture, towards the architectural homeostasis. The short time revolution would be absorbed into the long time evolution. What keeps the architectural evolution moving is the faith of some versatile rules governing architecture as all the –isms have tried with either retrospective or forward thinking. However, the question is, are there indeed such rules? Perhaps the answer itself is not important. What matters is the journey for finding the answer. We need both thoughts and actions to continue the architectural pilgrim.