

韓
天
辭

Portfolio of Tianci Han
Tsinghua University 2007-2011
Beijing China
Applying For StudioONE, Department of Architecture



FUJI TOWN

-A City In The Sea Depicted By Digital Ukiyo-e
Apr, 2011-Jun, 2011

Joint Studio With Princeton University and
Tokyo University
Team Leader Collaborator: Jia Xuezi

Micro-city Near Haneda Airport In Tokyo Bay
Main Tutors: Prof. Xu Weiguo, Huang Weixin
Joint Tutors: Kengo Kuma, Jesse Reiser



Portfolio - Portfolio



Traffic And Quays On Port of Tokyo

Main Functions of Quays of the Port

Sailing Routes And Seabed Topography Contours

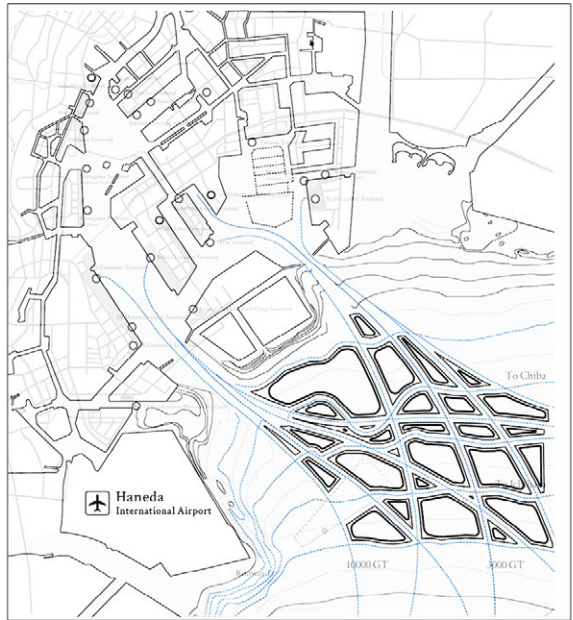
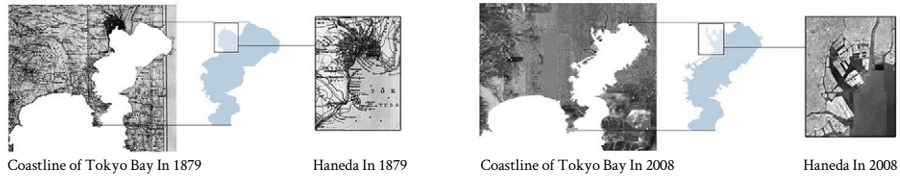


Coastline of Tokyo Bay In 1879

Haneda In 1879

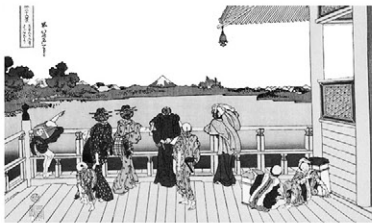
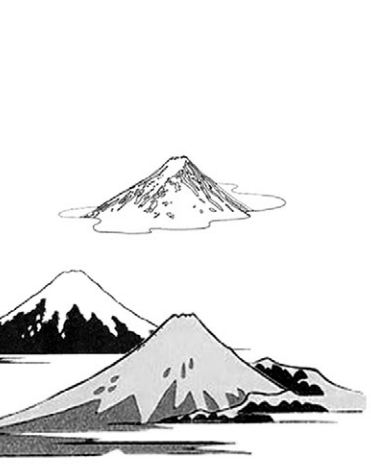
Coastline of Tokyo Bay In 2008

Haneda In 2008



Sub-Division of Future City's Site

Based on the Main Sailing Routes and Contours of Seabed Topography

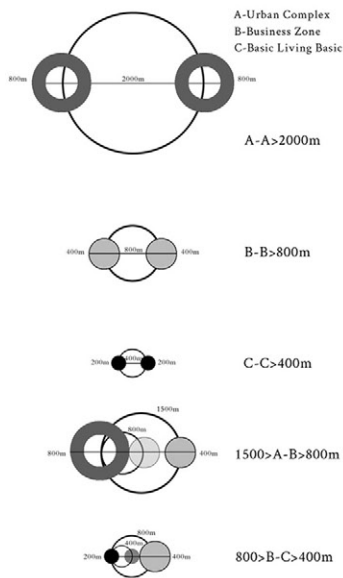
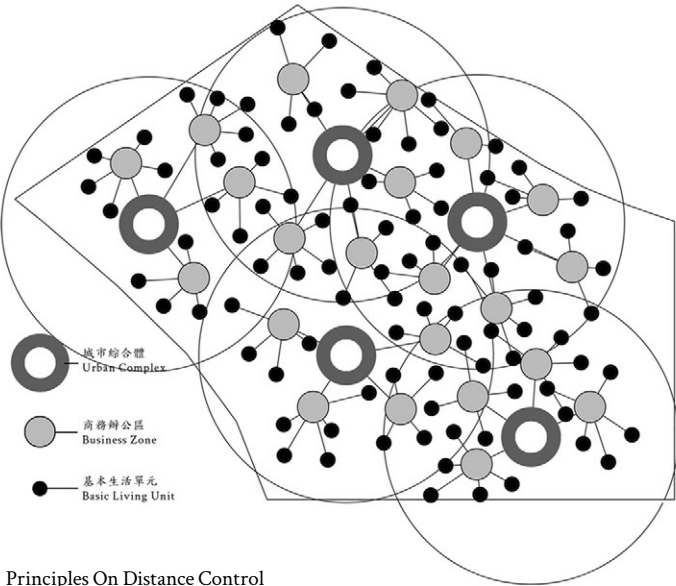
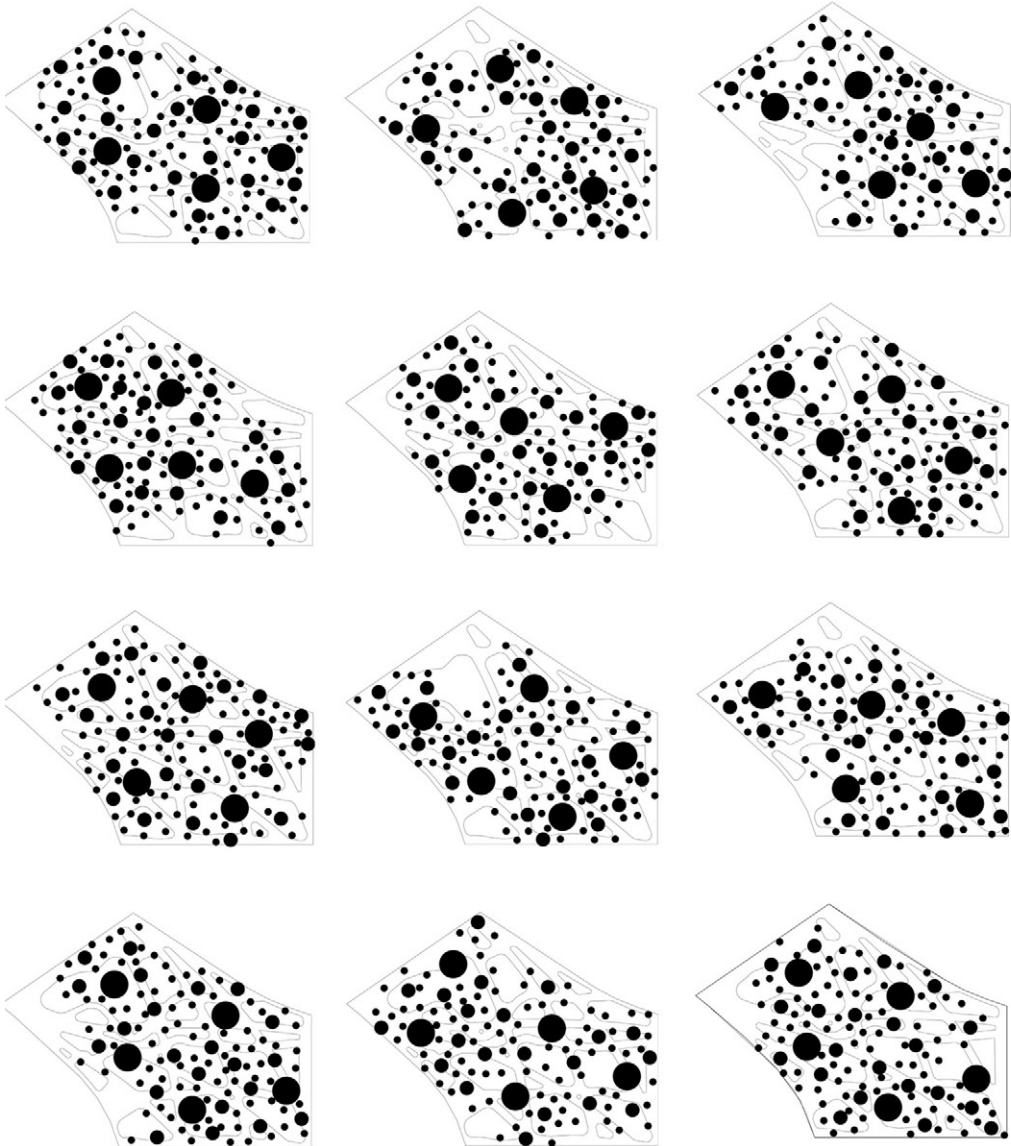


In Edo Period, people constructed nearly 200 small Fuji hills as symbols of faith. It was because that Tokugawa Ieyasu who chose Edo as the capital, was born in Suruga very near to Mount Fuji. To see the small hills as near view and the Mount Fuji as far view became great fun of Edo residents.

New Thirty-six View of Fuji

Sea Context

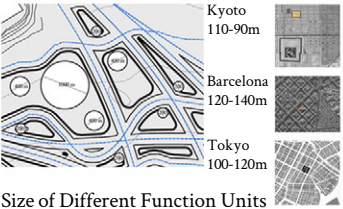




Principles On Distance Control

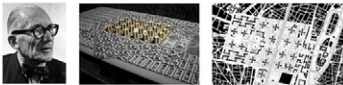
With the help of computer programme, we use the distance rule between 3 kinds of function units to make them generate randomly. We have made many trials and the future optimal choice will be among them. We want these different function units dispersed averagely within the site. And we also have considered about the traffic methods and optimal distance between any two kinds of function units among the three.

The rule is that distance between any two urban complexes is more than 2000m, and that between any two business zones is more than 800m, that between any two basic living units is more than 400m. As for the distance between urban complex and business zone, we hope the distance will be convenient for people driving to reach the destination in several minutes, so we define the distance between 800m and 1500m. The distance between business zone and basic living unit is defined between 400m and 800m for the convenience of walking to reach.



Size of Different Function Units

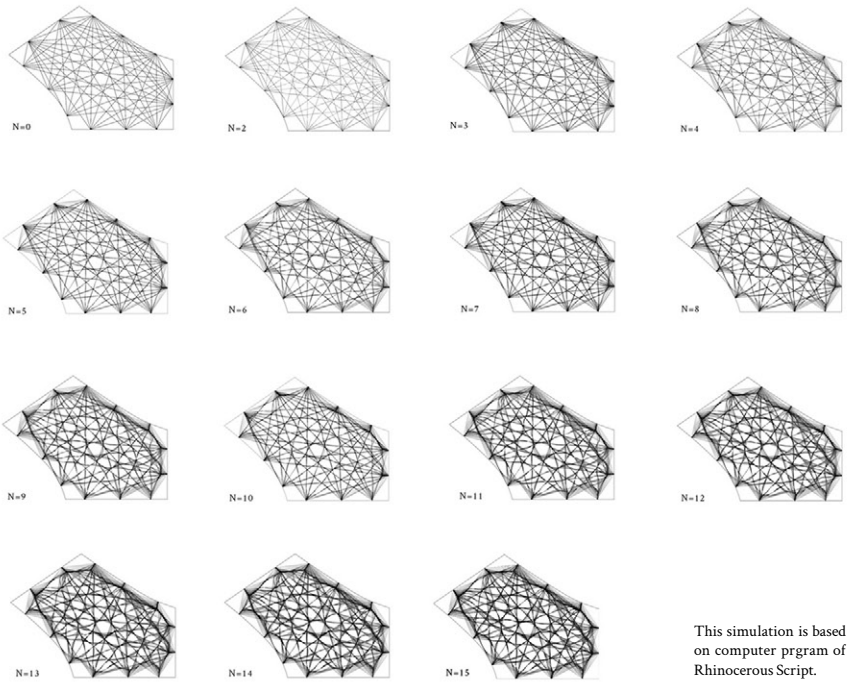
Spatial Archetypes



In contrast with traditional way of reclamation in the sea, we choose a structure of scattered dots. The archetype of this is from Le Corbusier's City of Tomorrow. For the city of scattered dots, we get much inspiration from works of Yayoi Kusama.

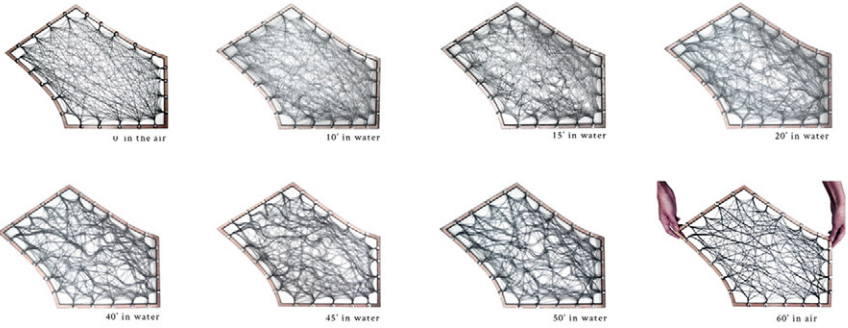
Portfolio - Portfolio

With the help of Wool Thread experiment conducted by Frei Otto, we try to find an efficient way to connect these scattered units of the city. This optimisation is aimed at connecting any two units conveniently while reducing the redundant paths to simplify the whole traffic system. We also make a physical model experiment in our site to get direct knowledge about the process of optimisation. During the experiment, wools stick with each other by the force of water. We put this process in computer simulation. We simulate the force of water by giving attraction to points on the lines. After 15 times' iteration, lines which are getting close begin to stick together and form an optimised result which is very similar with the model experiment.

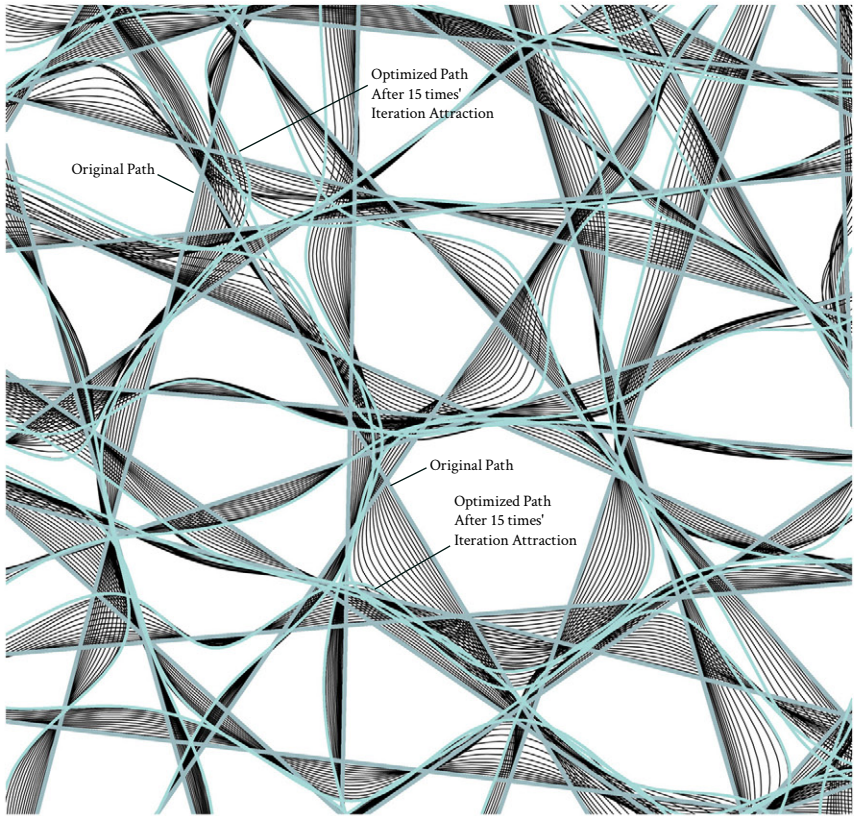


Process of the Model Experiment

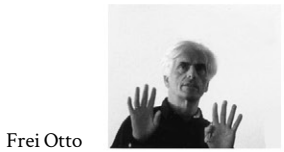
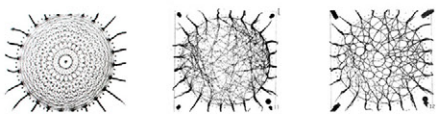
This simulation is based on computer program of Rhinoceros Script.



Physical Model Experiment On the Site Based On Wool Thread Experiment Conducted By Frei Otto

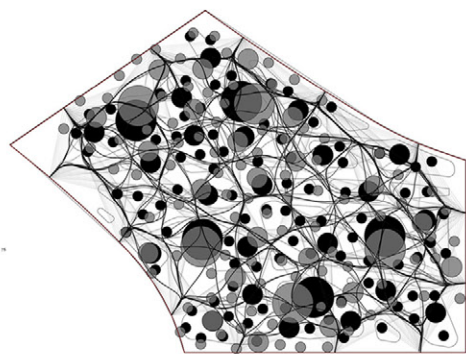
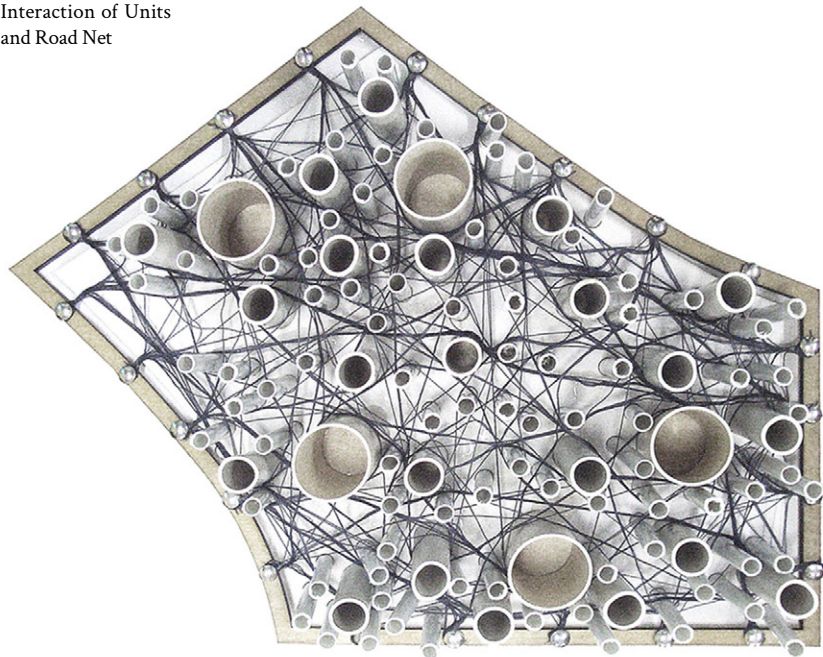


Frei Otto has made a classical model experiment called Wool Thread. The wool lines immersed in water will attract with each other and the physical process can be regarded as an optimization of the traffic system. Redundant paths will stick together to compose a main road.



Frei Otto

Interaction of Units and Road Net

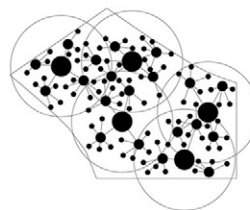


- Original Units
- Adjusted Units
- Original Traffic Sys
- Adjusted Traffic Sys

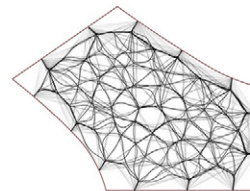
Based on the model experiment and computer simulation, we can count out the number of lines sticking together. The route holding more lines are designed as main avenues. For the convenient connection with other areas near Tokyo Bay, we set a ring road around the city. Furthermore, the road net system are lifted to 40 metres height to make sure the safety of ships sailing.

Adjugment of Units and Road Net

Distance Principle of Different Function Units.
The interaction will change the positions of function units, whereas the adjusted units must still meet the original distance principle.



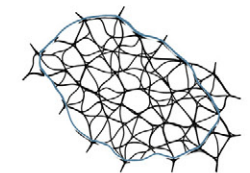
Wool Thread Model Experiment and Simulation.
The road net simulated by computer will further interact with function units to adjust the optimization result to proper position.



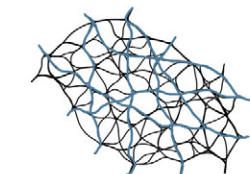
Site Division By Sailing Routes.
The adjusted units must be located in the range of original sites divided by main sailing route.



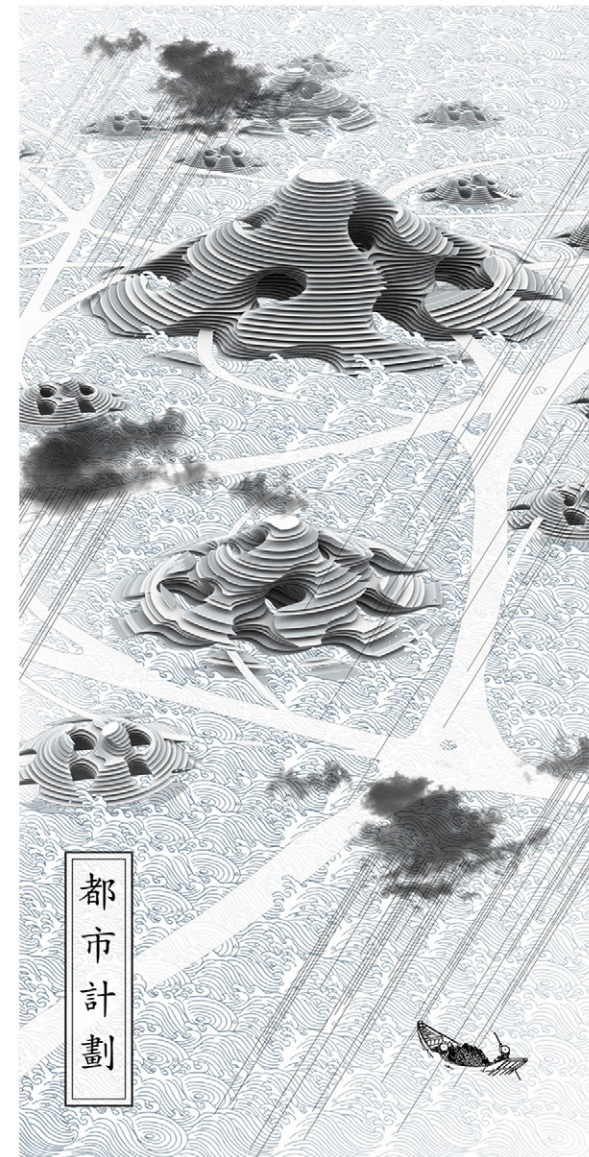
Three Principles of Interaction Between Units and Road Net



Ring Road of the 1st Class



Main Roads of the 2nd Class

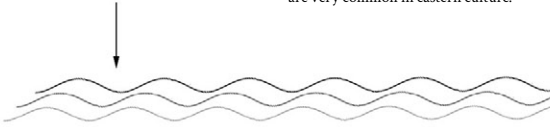




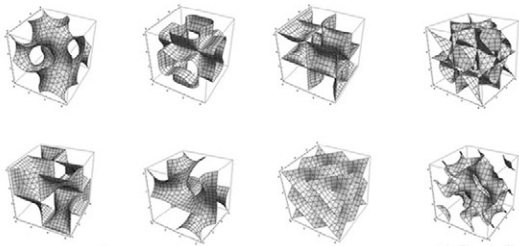
Top View of Urban Complex Fuji

$$Y=A\sin(\omega X+\varphi)$$

Generation of the unit form comes from the water patterns in traditional paintings which are very common in eastern culture.



The original form similar to Minimal Surface is generated from Mathematica and it can form a 3D space range with specific characteristics. We want this water-pattern forms can act as the main structure of every Fuji unit to reflect the water environment around and make interior space more interesting.

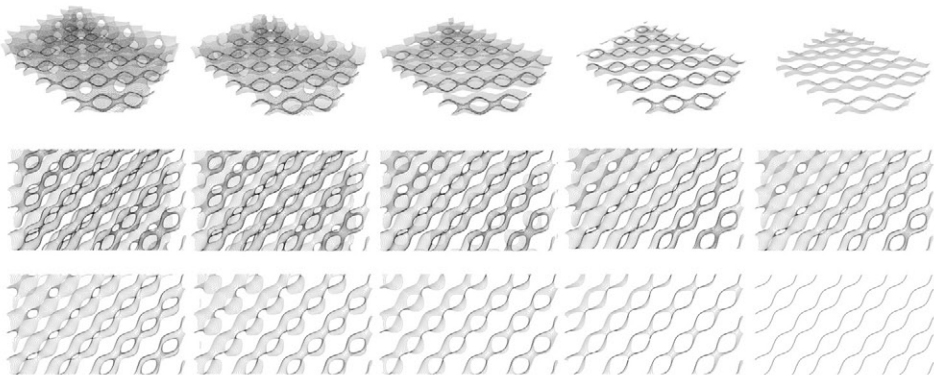


$$M=\cos[x]\sin[y]+\cos[y]\sin[z]+\cos[z]\sin[x];$$
$$G=\text{Contourplot3D}[M=0,(x,0,2\pi),(y,0,2\pi),$$
$$(z,0,2\pi)]$$

In software of Mathematica, we try to generate different space units with different maths formulas. These space units can be copied continually and unlimitedly in 3D space . We combine several units and use Fuji shape to carve out the final form of our different space.



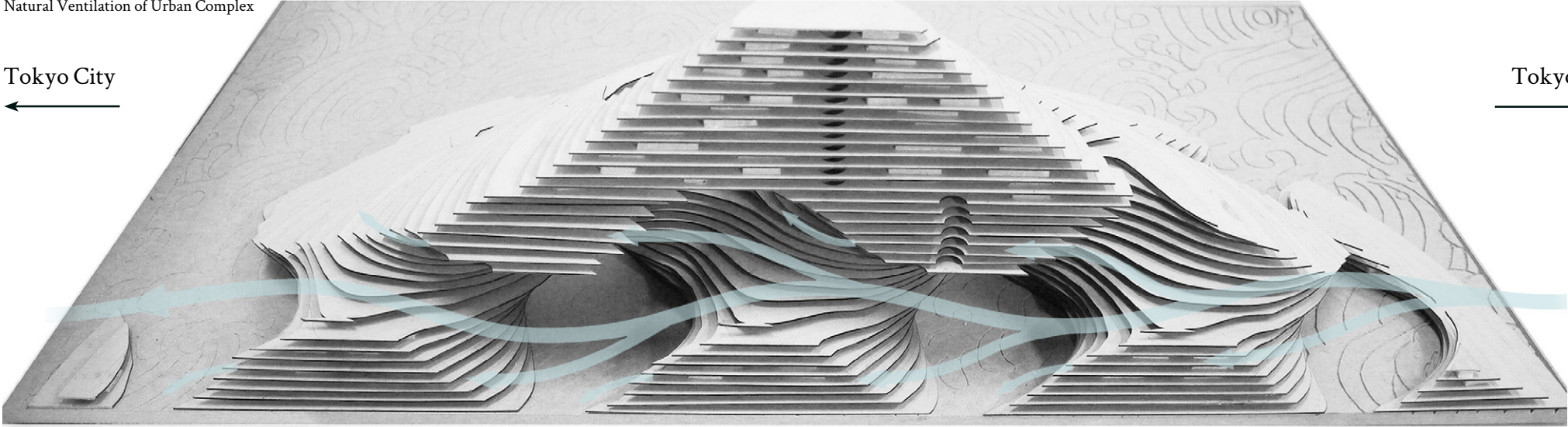
Resource of Form- 3D Development of Traditional 2D Water Patterns



Tokyo City

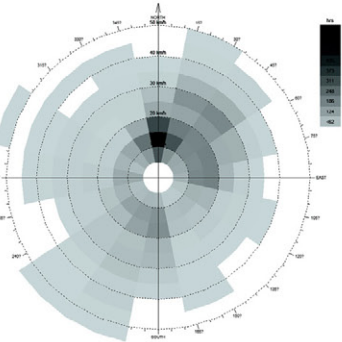


Tokyo Bay

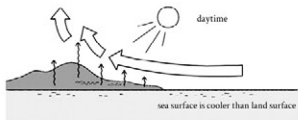


To Dissolve the Huge Construction From Inner Space

This space form similar with minimal-surface can bring enough outdoor space into inner space of the huge building. This outdoor space can provide fresh air and daylight and serve as traffic or social interaction space. Around these 'holes' inside the building, there are many platforms for people going out to do outdoor activities and experience the fresh feeling of this multi-layer space while enjoying the beautiful scenery of Tokyo Bay.

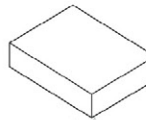
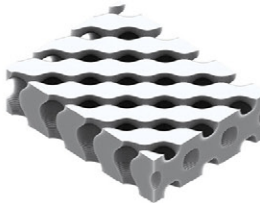


Prevalant Winds of Tokyo Bay

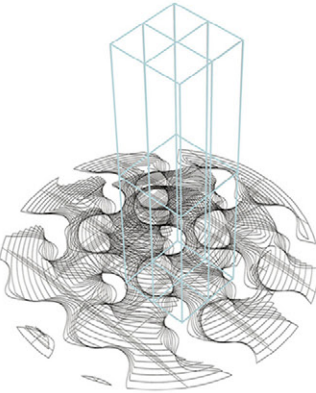
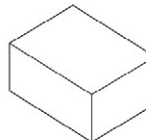
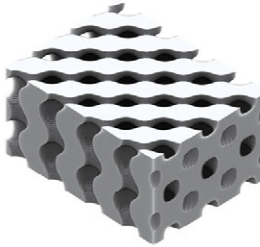
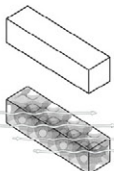
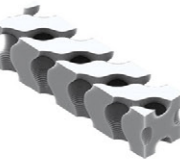


Sea-land Thermal Force

Basic 'Minimal Brick'



A basic minimal surface described in Mathematica can be transformed into a space unit which can be separated to 2 parts. The indoor part can be furtherly divided into several layers as building's floors.



The minimal brick depicted by digital patterns can be arrayed in 1D, 2D or 3D space to form a structure with the great advantage of ventilation.

海上富士

Fuji Town
- a city of digital Ukiyo-e

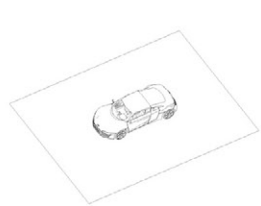


SLICES

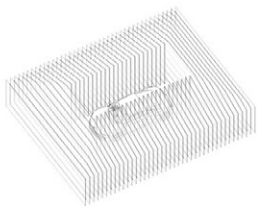
-Audi House
Jan, 2011-Mar, 2011

Audi House, Professional Work
Project Team: Yung Ho Chang, Kelvin Lin
Tianci Han, Jing Liu.
Yung Ho Chang Atelier Feichang Jianzhu

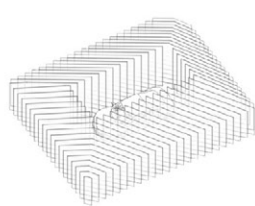
非常建筑



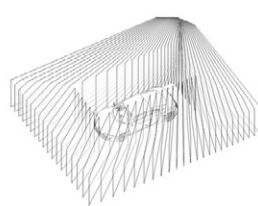
Mode 1



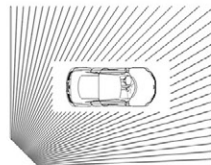
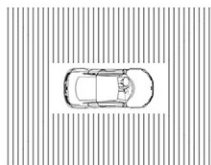
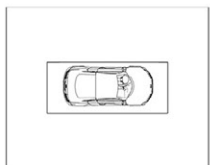
Mode 2



Mode 3



Mode 4



A Chinese artist, Xia Xiaowan, re-create Chinese traditional painting in his art installations. Just like this installation below, Xia Xiaowan 'painted' the traditional 'Shan Shui' in 3D space by a lot of glass slices. As is known to everyone, the traditional Chinese painting is plan art in 2D space, and there is no perspective in the scenes of the image. However, Xia uses these simple glass slices to analysis and explore the traditional painting in a new method. An integrated painting is deconstructed into several image slices to create a different method of watching and appreciating. A 2D traditional Chinese painting has been re-interpreted in 3D space to combine both western perspective effect and eastern taste.

Chinese Ancient Landscape , Xia Xiaowan
Paint On 24 Pieces of 6mm Glass, 2007



Audi House in Different Slices

This art installation gives us much inspiration to re-think the method of watching a showing car. How to change the watching method and provide people with different watching experience is the main issue we think about.

In ordinary car shows, visitors see many cars directly on the booth and after a long time they will feel boring and tired. To change the method of watching cars and intrigue people's more interest is crucial for this new show of Audi A8L. We try to use glass slices in different directions to create different vision environment around the car. Through several layers of glasses, people will see the car image showing in different gradations. This special visual effect can add some mystery to the car and attract more people to get close of it to see more clearly.

We tried different methods of dividing an ordinary house space in several slices. At last we choose to use the radiation method to create more rich and varied visual effects.



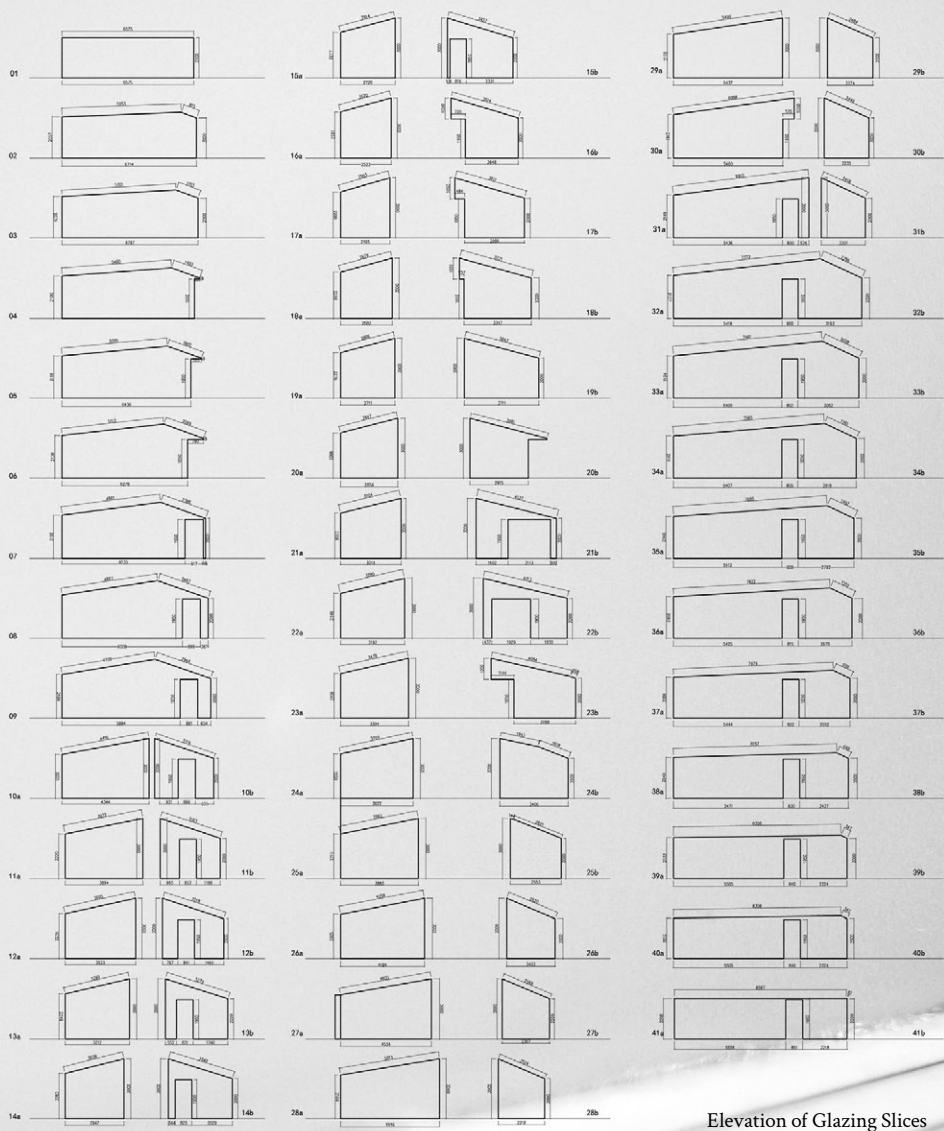
Plan of the Pavillion

Pavillion of Audi A8L

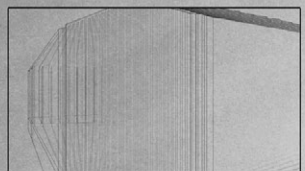
This project is not a building with specific function. It is more alike an installation art work. It goes back to the basic interst of to see and to be seen with a simple construction. This is a pavillion for a car's show, and also a micro park full of fun and childhood memery. It can easily remind you of the simple game named 'hide and seek'.

It is a low-key show without exaggerated expression. By several glass slices, this pavillion has changed the tradition way of showing and watching. The car is hidden in the transparent pavillion which can make the image of the car distorted and fascinating with the reflection and refraction of glasses in different angles. This pavillion will entice your intense interest and curiosity to look inside. This new method of watching can not only bring much fun of seeing in different angles, but also make a more successful show for Audi client.

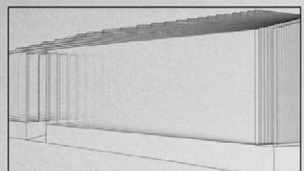
To realise this project with proper materials, we have made many different trials on glass division for the convenience of installation and safety consideration. There are 50 pieces of glasses in total for this project and each piece of glass is in different shape and has different cutting angles.



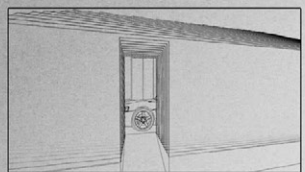
Elevation of Glazing Slices



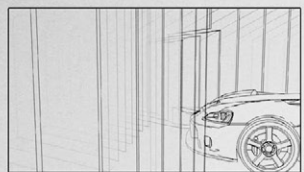
A



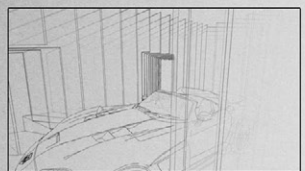
B



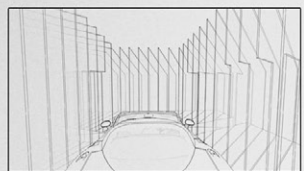
C



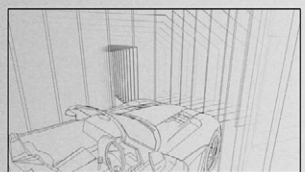
D



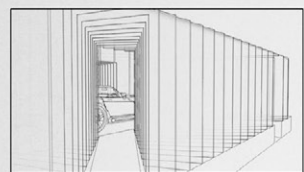
E



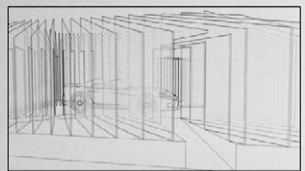
F



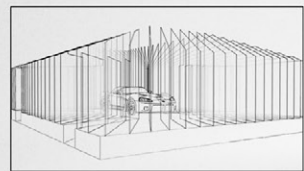
G



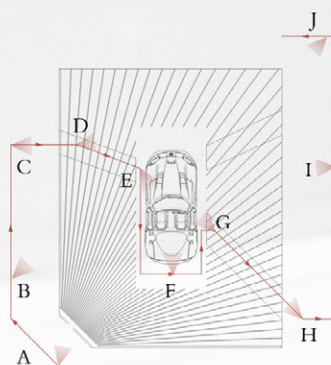
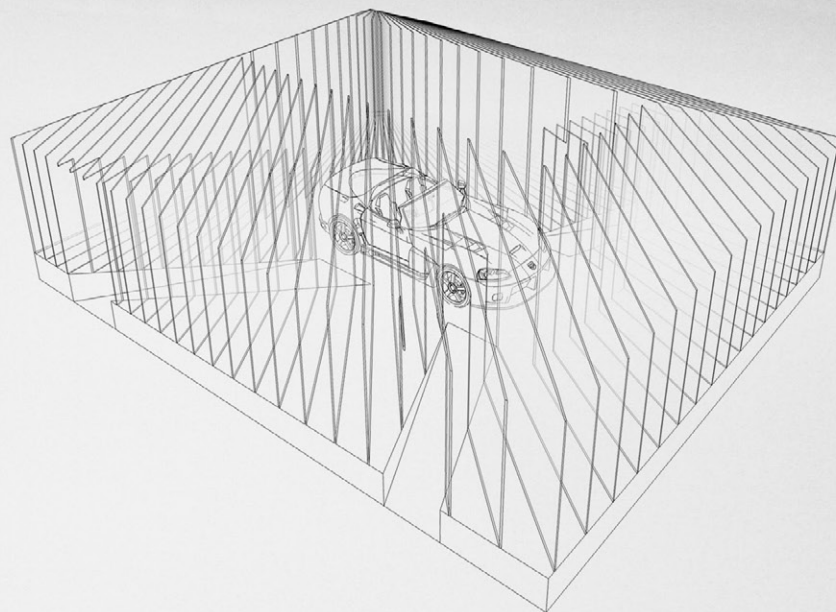
H



I



J



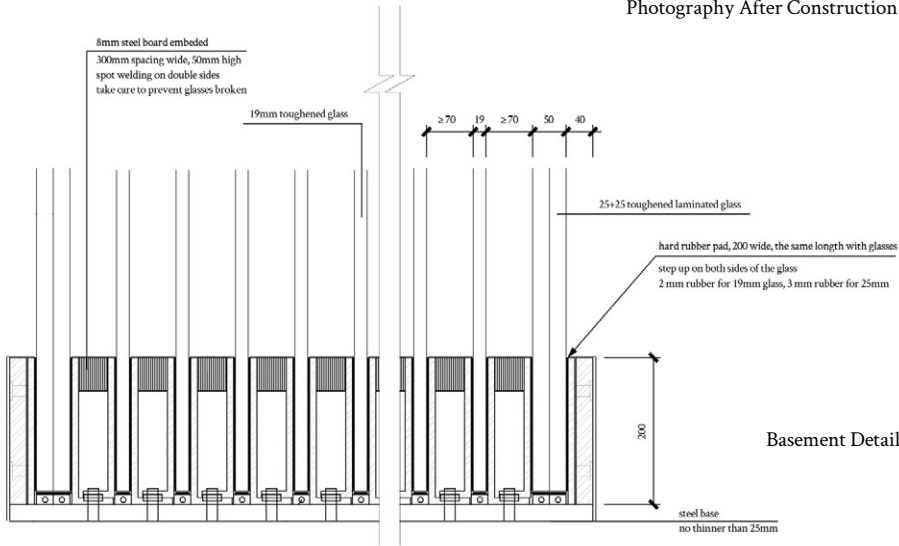
Different Views On the Visiting Path

This show pavillion provides people with different watching methods. You can see through the glasses at a distance with the car and you can also enter this pavillion to touch it. The glass slices in different angles can make varied visual effects when you pass by. In different places you will get different images of this Audi car.

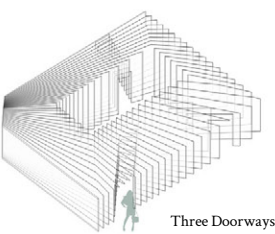
Along a typicle visiting path we set 10 view spots to show the varied visual effects. From outside to inside, far to close, these 10 view spots can offer the whole image of this car in different ways and it will be totally changed from the traditional car shows.



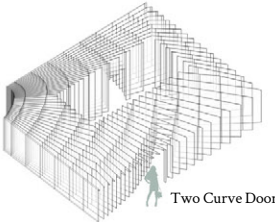
Photography After Construction



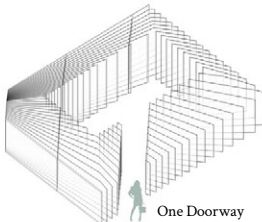
Basement Detail



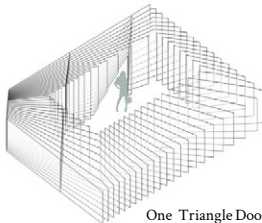
Three Doorways



Two Curve Doorways



One Doorway



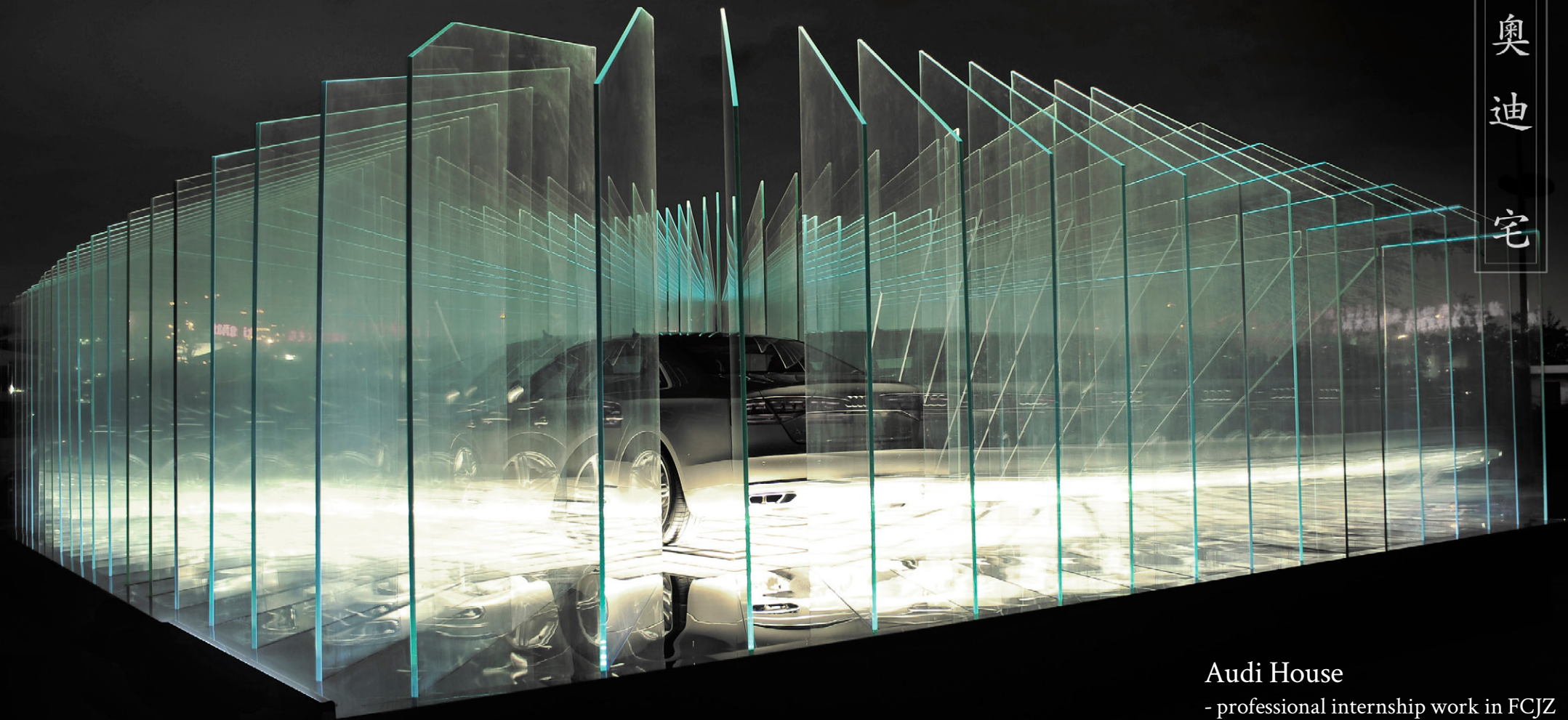
One Triangle Doorway

Different Doorway Trials For the Real Construction



For real construction we meet a problem that the glass can't be cut into a too large piece for safety and construction reasons, so we need to sub-divide every glass slices into more small pieces. However, more divisions will damage the whole visual image of the pavillion. The final solution we choose is to keep only one doorway and make it in triangle shape to reduce the division junctures to the maximal extent. This choice is also based on different trials of sub-division methods. The new triangle doorway also change gradually to create a special visual effect in gradation. At last, different pieces of glasses are connected by steel clasps to form an integrated one which is finally fixed on a steel basement.

奧
迪
宅



Audi House
- professional internship work in FCJZ