PORTFOLIO

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2015 - 2020

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Project 1

RESIDENTIAL-BUILDING DEMOLITION GUIDE

Group work
Cooperator: Yinqing Zhu, Hosomi Asahi, Ran Yan
Site: Tiantongyuan, Changping District, Beijing
Autumn of 2019

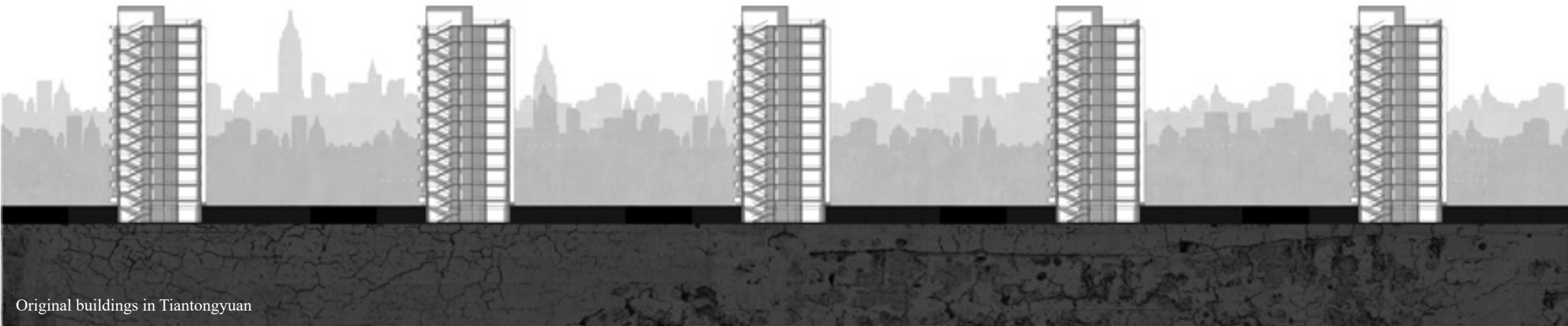
[Residential-Building Demolition Guide]

"to build happiness, by carefully designed demolition"

Forty years after the death of modernism, the planning of Chinese residential areas are still guided by CIAM-like principles. The Tiantongyuan area in Beijing is a telling example of how these ill-planned blocks would finally deteriorated into devitalized ghost town and commuter town. In this guidebook on demolition, we propose a strategy of revitalization, a seemingly destructive while actually constructive way, to build and spread happiness in those abondaned residential areas.

To topple old buildings is of course an audacious move —— but it preserves the image of modern housing to the utmost extend. The unhappy nature of modern space would be drastically altered simply by a change of angle, and the life of buildings as well as community memory would be extended. In serious architectural discussions, our black humour might provide a new perspective to reflect on modernism; and among non-professionals, this gimmick promises to attract consideratable attention and potential economic benefits via social networks.

Happiness and possibilities, together with gravitational energy, are released as buildings fall down.



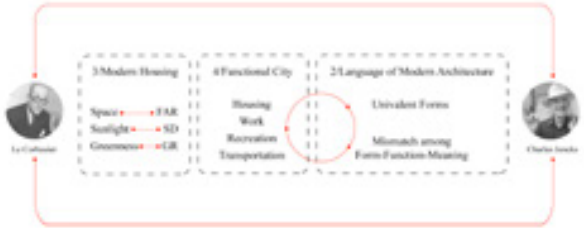
Original buildings in Tiantongyuan

Abandoned residential buildings can hardly escape the fate of being demolished by explosion. But explosion is a declaration that completely negates the past—— no relationship could be built between the new buildings and the old ones. At the same time, explosion also rudely disrupts the life cycle of a building, resulting in the waste of energy. The complete demolition of a residential building not only requires the cost of demolition itself such as blasting, but also deplete the demolished building materials which could be otherwise recycled. Only the land could be sold again.

In this design, we try to discover the possibility of abandoned buildings in its afterlife other than second-life. A bold move which overthrows the original boring Descartes system would present people a strong visual impact while filling the space with possible new functions. On the one hand, the community's memory would be updated, creating a unique urban landscape; on the other hand, energy consumption would be reduced in the entire life cycle of the building.

We believe that the current context also has the value of survival.

Afterlife vs. Second-life]



It's easy to see how floor-area-ratio, sunshine-distance, and greening-rate—— three most dominating indicators in Chinese residential planning—— completely comply with Le Corbusier's three expectations for modern living: space, sunlight, and greenness. Also, housing and working space has for long been separated in China just as they once did in CIAM's ideals for the Functional City.

Tiantongyuan reminds us of Pruitt-Igoe urban housing project in downtown St. Louis, who's being totally cleared by explosion in 1972 was identified as the symbol of modernism's death moment by Charles Jencks. Though social and political factors also conduced to the failure of Pruitt-Igoe, Charles' assertion holds its merit in that modern housing provides a pattern of living as homogenous as its hospital-like image.

Here in Tiantongyuan, we attempt to rewrite the history. Are there any other ways to avoid an inglorious end of modernism housing and extend the life of those residential buildings into a new phase? Could we turn the weakness of modern architecture, its focus on univalent forms, into its edge—— possibility of being easily transformed and interpreted as non-housing?

1 Dig out the building foundation

2 The original foundation layer is reinforced with deep foundation pits, and temporary protective structural measures are carried out on the inside and outside of the building

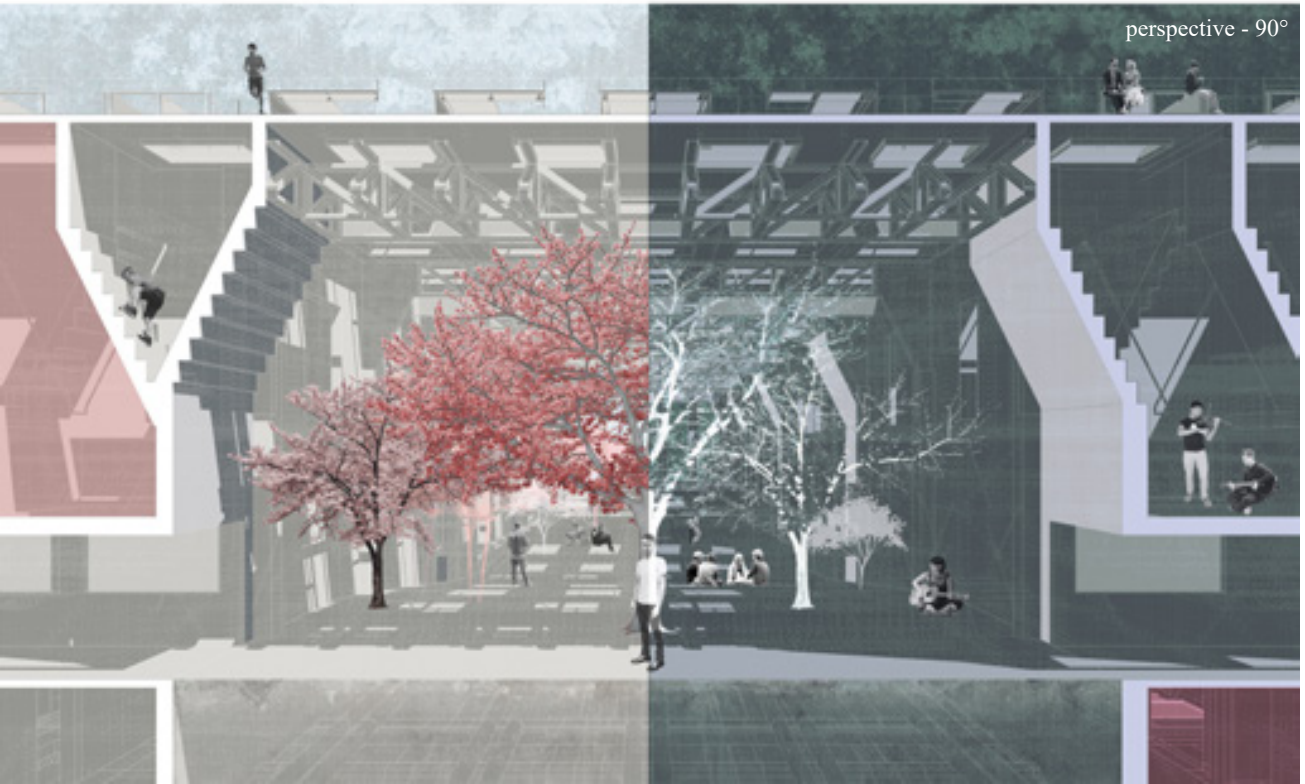
3 Tilt building as a whole, according to the depth and angle of the buried to control the tilt operation

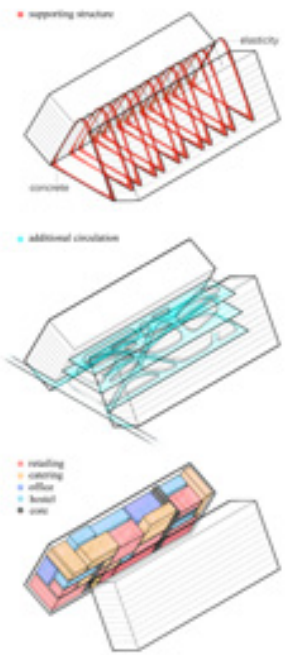
4 The whole building is put down, and permanent structural protection measures are carried out on the interior of the building according to the preset down angle

5 Demolition of temporary structures to achieve the "push down" of the building

Construction process

perspective - 27° combination


perspective - 90°


supporting structure
concrete
additional circulation
retailing
catering
office
hostel
core

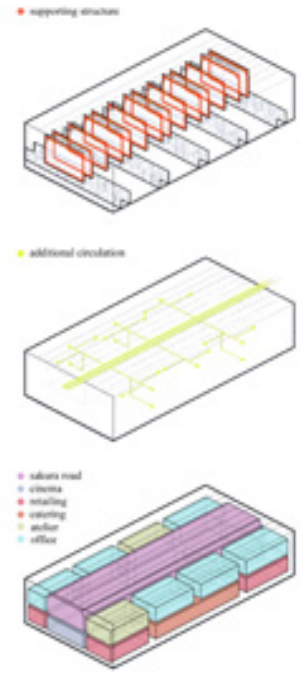

supporting structure
additional circulation
salsats road
cinema
retailing
catering
atelier
office

diagram - 8° gym

Turning the slope right into a long running-machine, which could be the core of the gym

diagram - 45° office

Inserting horizontal floor to provide spaces for ordinary daily use.

diagram - 65° theatre

A theatre carved out of ordinary residential building - most exciting stage setting

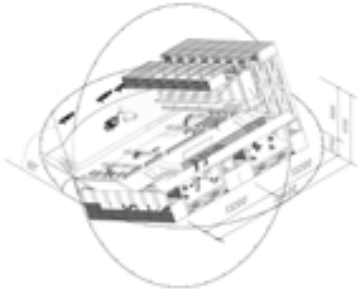


diagram - 10° rooftop meadow

Creating a relaxing atmosphere on rooftop by adding a sloping meadow

diagram - 45° sushi ferris wheel

Turning a two-dimensional sushi train into a three-dimensional sushi ferris wheel

diagram - 65° swimming pool

Swimming pool in the air, providing you chances to look down at your neighborhood

diagram - 30° exhibition

A space woven by two coordinate system

diagram - 60° amusement park

A paradise for children, families, and skaters

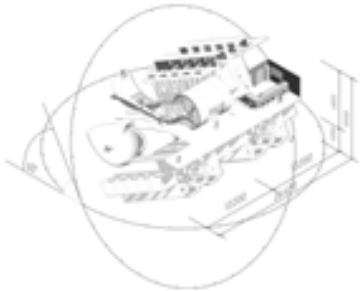
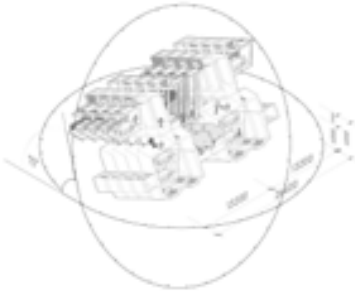
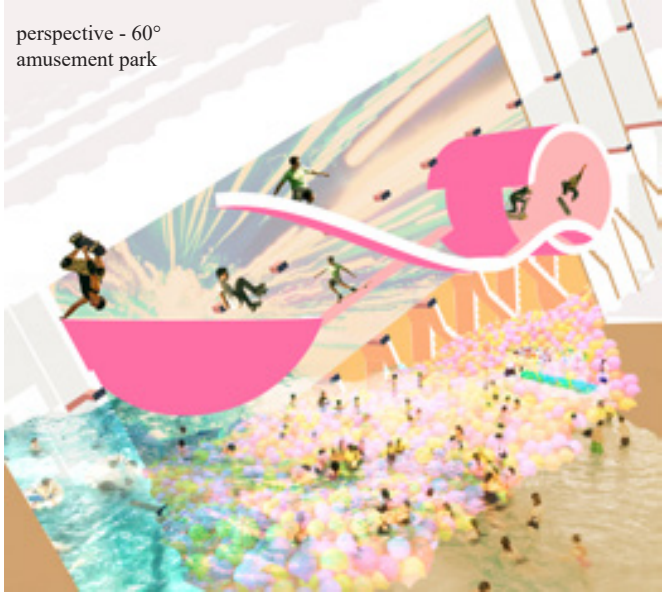


diagram - 75° hanging space

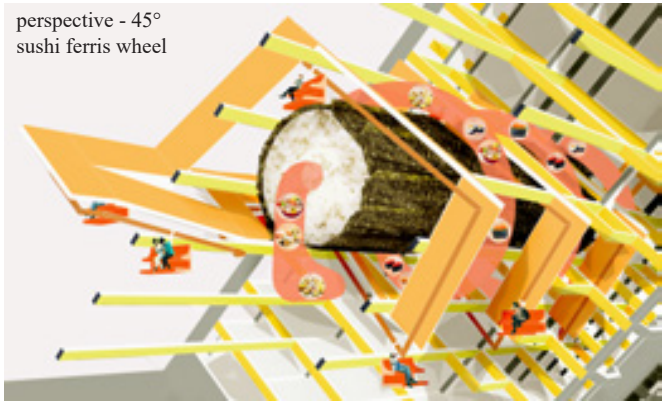
Your own office on a swing



perspective - 60°
amusement park



perspective - 45°
sushi ferris wheel



perspective - 90°
circus

Project 2

CROSS THROUGH TSINGHUA UNIVERSITY

Personal work
Instructor: Rong Zhou
Site: Shahe, Changping District, Beijing
Summer of 2019

In the aspect of conceptual design, there are many design competitions related to skyscrapers. One of the most influential is the evolo design competition. Every year, dozens of winning programs emerge to explore the infinite possibilities of skyscrapers from various angles and aspects. The organizer of the competition will publish the relevant information such as the competition drawings and concept introduction on the official website, which provides sufficient information for this article.

Evolo design competition started in 2006, and by April 1, 2019, the organizers have made public the winning works of 13 years' design competition from 2006 to 2018. Each year, one first, second and third prizes will be announced. The number of nominations will vary from year to year, with a maximum of 32 in 2011 and a minimum of 19 in 2009. In the past 13 years, there have been 306 awards.

To sum up, based on the winning works of evolo design competition, this paper constructs a case database of 306 skyscraper conceptual design schemes. The case database is composed of scheme information in the form of words and scheme drawings in the form of images. Among them, the text information includes the name of the scheme, the designer, the year of award, the website of scheme details, etc.

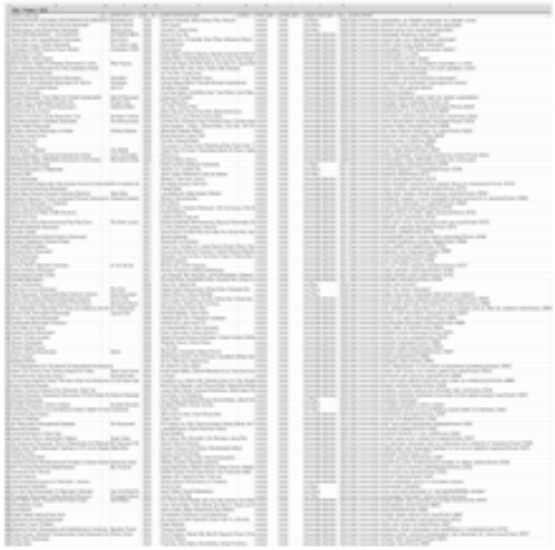
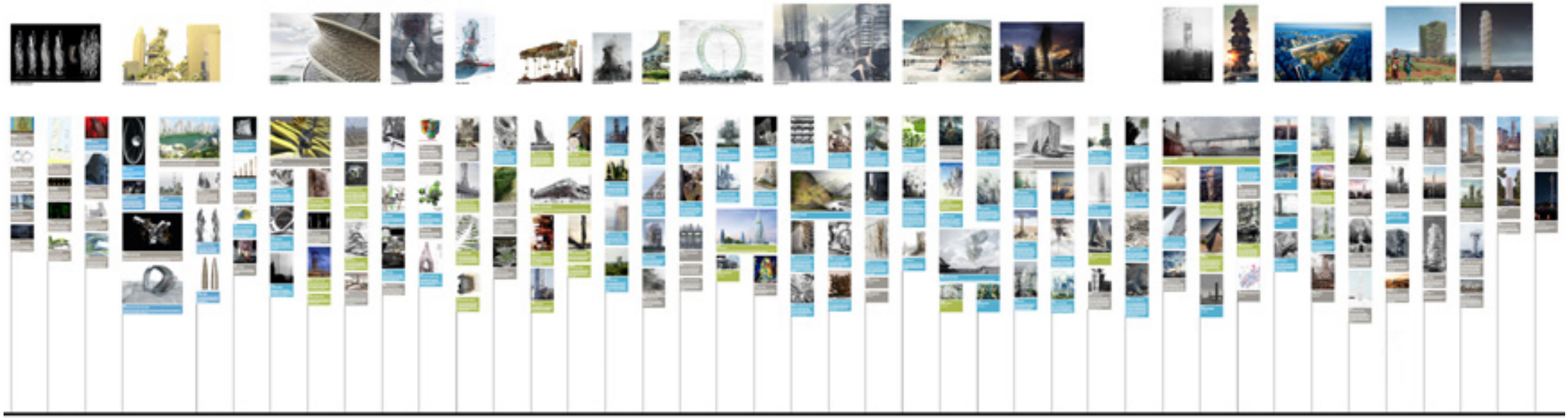
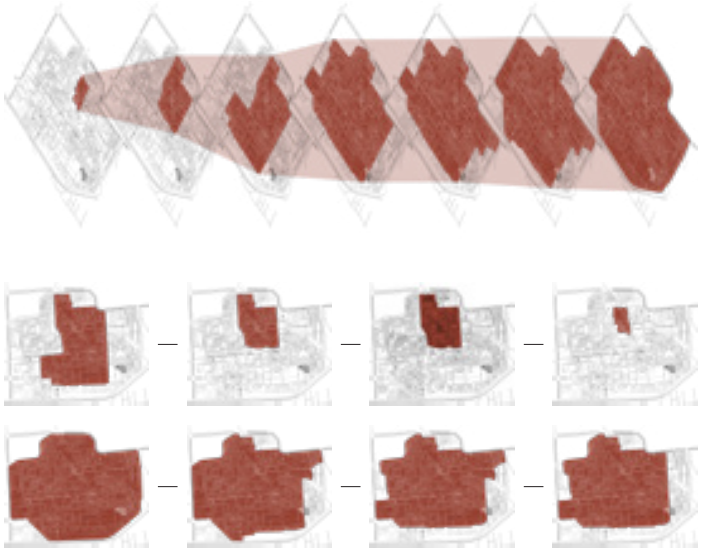
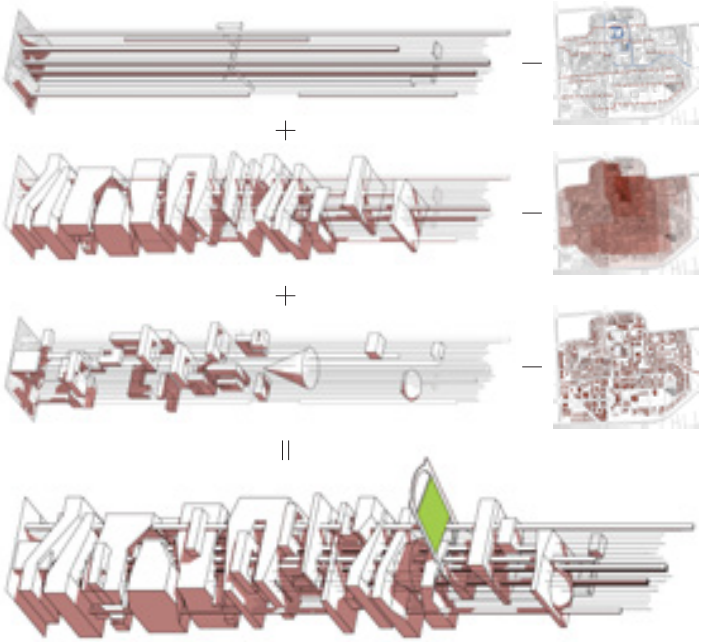


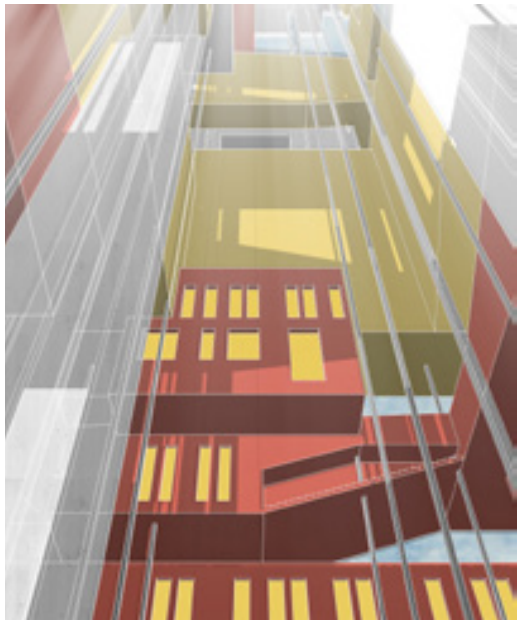
table of program information

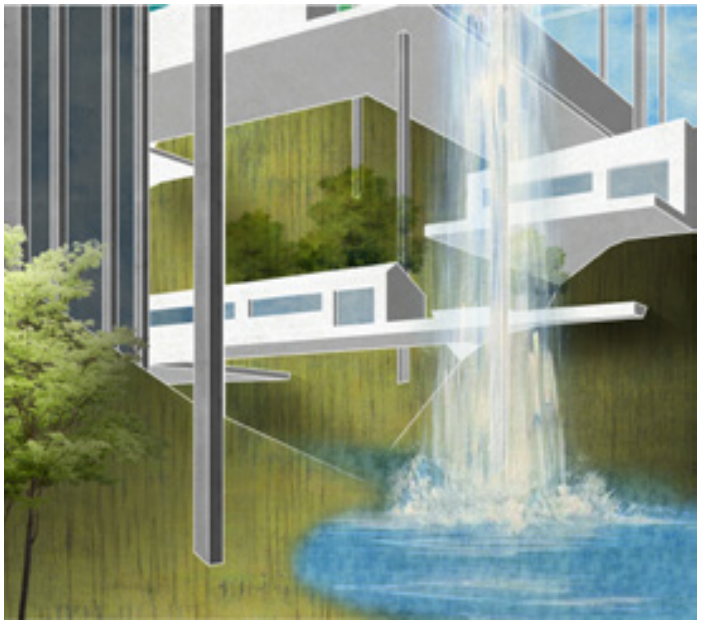
tagging system for programs











25F Plan 1:1500

45F Plan 1:1500

Project 3

TOKYO 2020

Group work
Instructor: Weiguo Xu
Cooperator: Yixi Shen
Site: Umino-mori Park, Tokyo, Japan
Winter of 2019

SHAPE EVOLUTION Involving the Function of Olympics

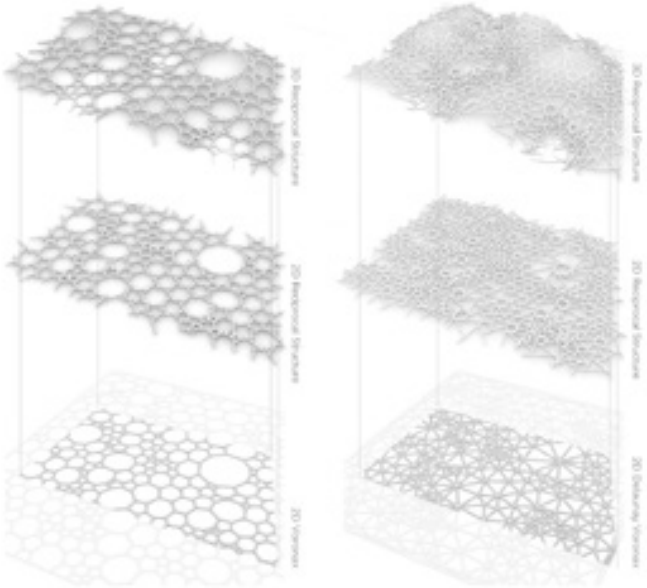
Improve the Algorithm with new tool

Before the midterm, we generate the preliminary structure with the help of MeshMachine, thus creating a gradual changed base. However, it was still a gap between the result and our ideal complicated form of a random size difference. Therefore, we tried to seek and learn new method again to complete the target. Finally, we found an algorithm called Voronax.

Voronax is a specific type of structure obtained when a Voronoi diagram is "relaxed" over a free form surface. We used a plug-in called Voronax exe for the generation of Voronax structures. Voronax exe is developed by Milos Dimoic at the Stuttgart University in 2008 as a part of his PhD thesis.

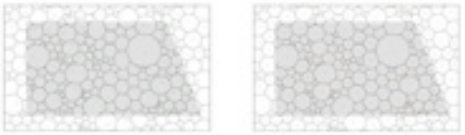
The generation process of Voronax is as followed. Firstly, it creates a set of "seed" points within the surface we choose. Secondly, the seeds are reorganized to create the center points of the polygons. Finally, it form the structure use the logic of Voronoi formation.

Since structure of triangles and one of polygons are just two extreme situation of reciprocal structure, we can adapt the Voronax base to a reciprocal structure through the same way as before. And also, we tried the both types of formation to see which one is better in look and functional adaption. In the end, we chose the structure of polygons to develop our site and terrains.The up-and-downs is according to the logic of a whole feather or fur. Where the structure is loose and large, the base will be lifted up; and where it is dense and small, the base will be pressed down.



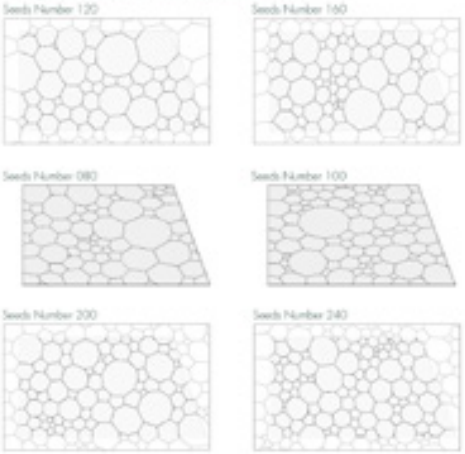
The Key Step of Recalculating the Seeds in Voronax

Random seeds (Left) Reorganized seeds (Right)



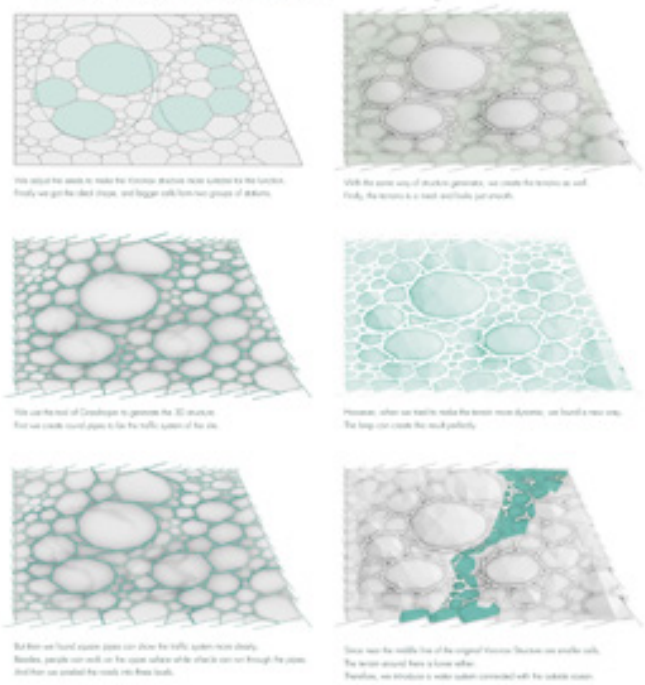
Trials for Voronax Structure

Regular cells (First row) Oval-like cells (Second row)



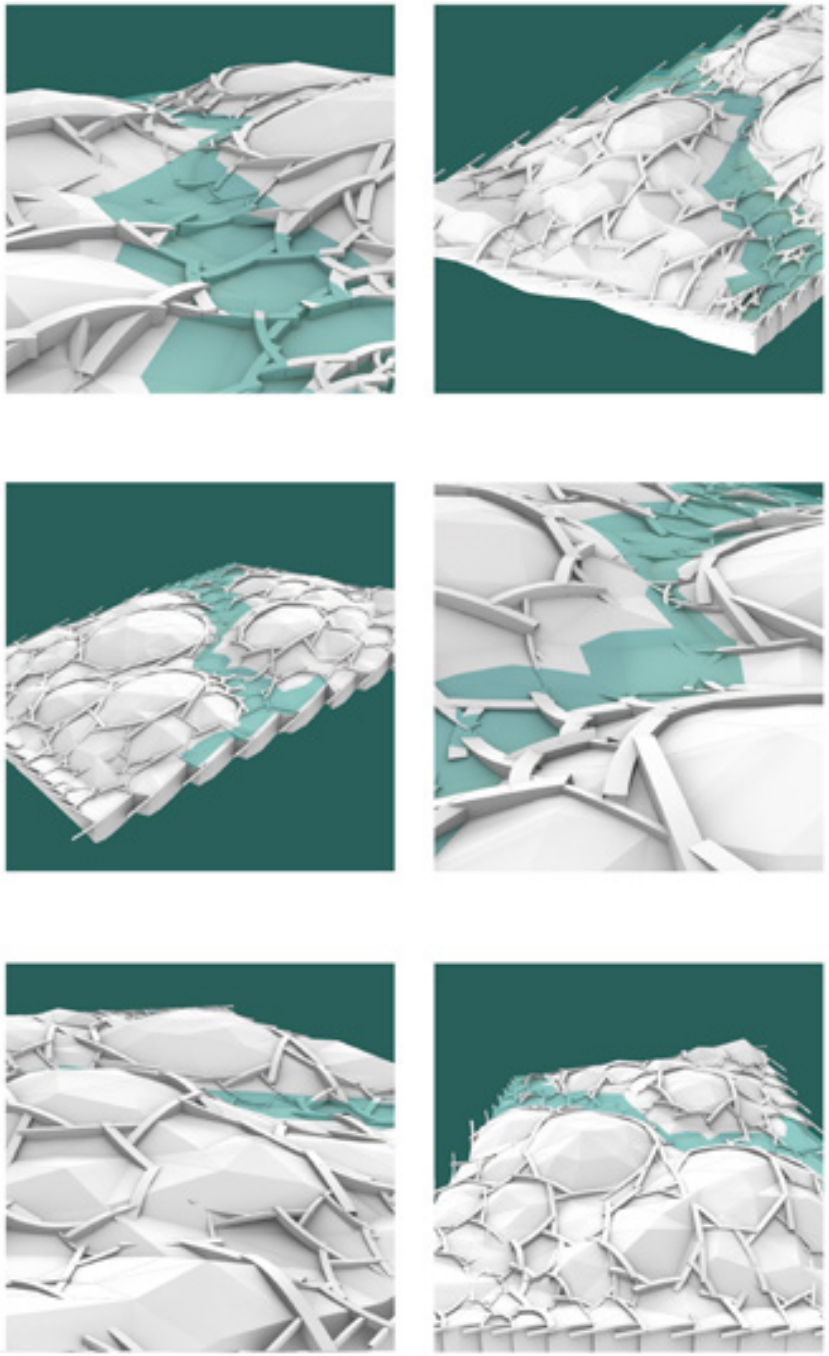
Trials for Voronax Structure

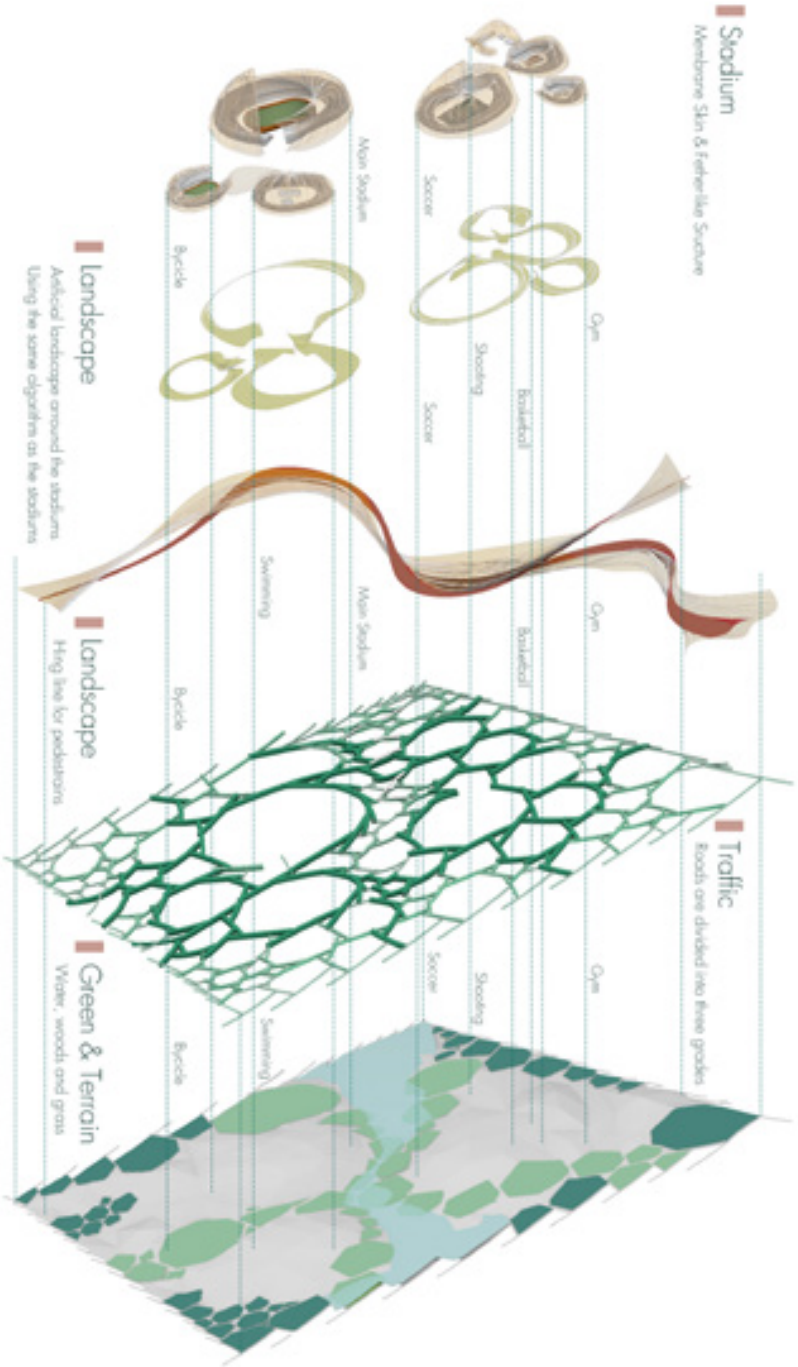
Regular cells (First row) Oval-like cells (Second row)



TERRIAN DISPLAY Result of multi-factors

A Base for Olypic Stadiums

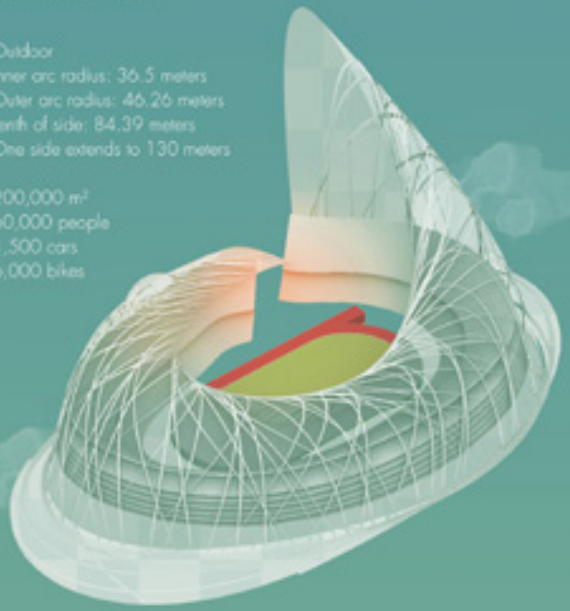




MAIN STADIUM

Outdoor
Inner arc radius: 36.5 meters
Outer arc radius: 46.26 meters
Lenth of side: 84.39 meters
One side extends to 130 meters

200,000 m²
60,000 people
1,500 cars
6,000 bikes



BASKETBALL ARENA/VOLLEYBALL COURT /BADMINTON COURT

Indoor
15m×28m
Min clearance: 10m

60,000 m²
12,000 people
300 cars
1200 bycicles

SHOOTING HALL

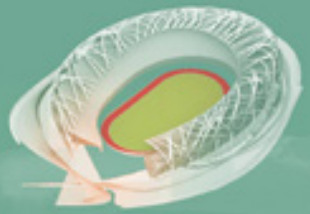
Indoor
8 tracks, 2m wide
Distance to target:
10m, 25m and 50m
2 tracks, 4m wide
Distance to target: 70m

6,000 m²
2,000 people
50 cars
200 bycicles

VELODROME

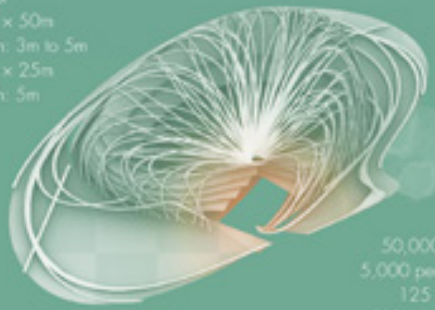
Indoor
Inner arc radius: 24.09m
Outer arc radius 30.1m
Length of side: 55.7m
Track gradient: 12 ° to 45 °

25,000 m²
5,000 people
125 cars
500 bycicles



AQUATICS CENTER

Indoor
25m × 50m
Depth: 3m to 5m
25m × 25m
Depth: 5m



50,000 m²
5,000 people
125 cars
500 bycicles

SOCCER FIELD
FOOTBALL FIELD
HOCKEY FIELD
TRACK FIELD

Outdoor
70m x 144 m

60,000 m²
18,000 people
1,500 cars
6,000 bycicles

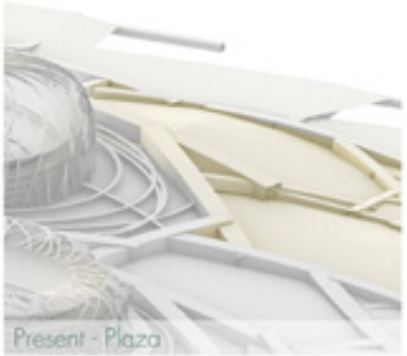
GYMNASTICS HALL

Indoor
31m x 44m
Min clearance: 8m

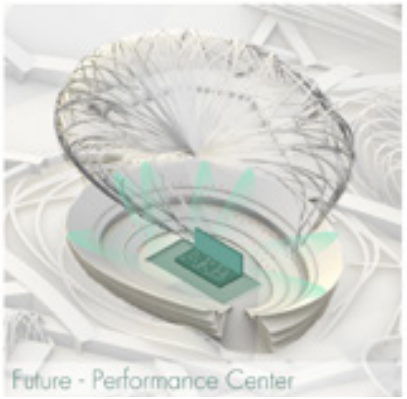
5,000 m²
5,000 people
125 cars
500 bycicles

Present - Basketball Arena

Present - Gymastics Hall

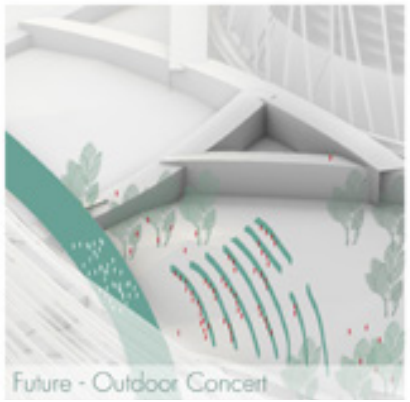

Present - Plaza

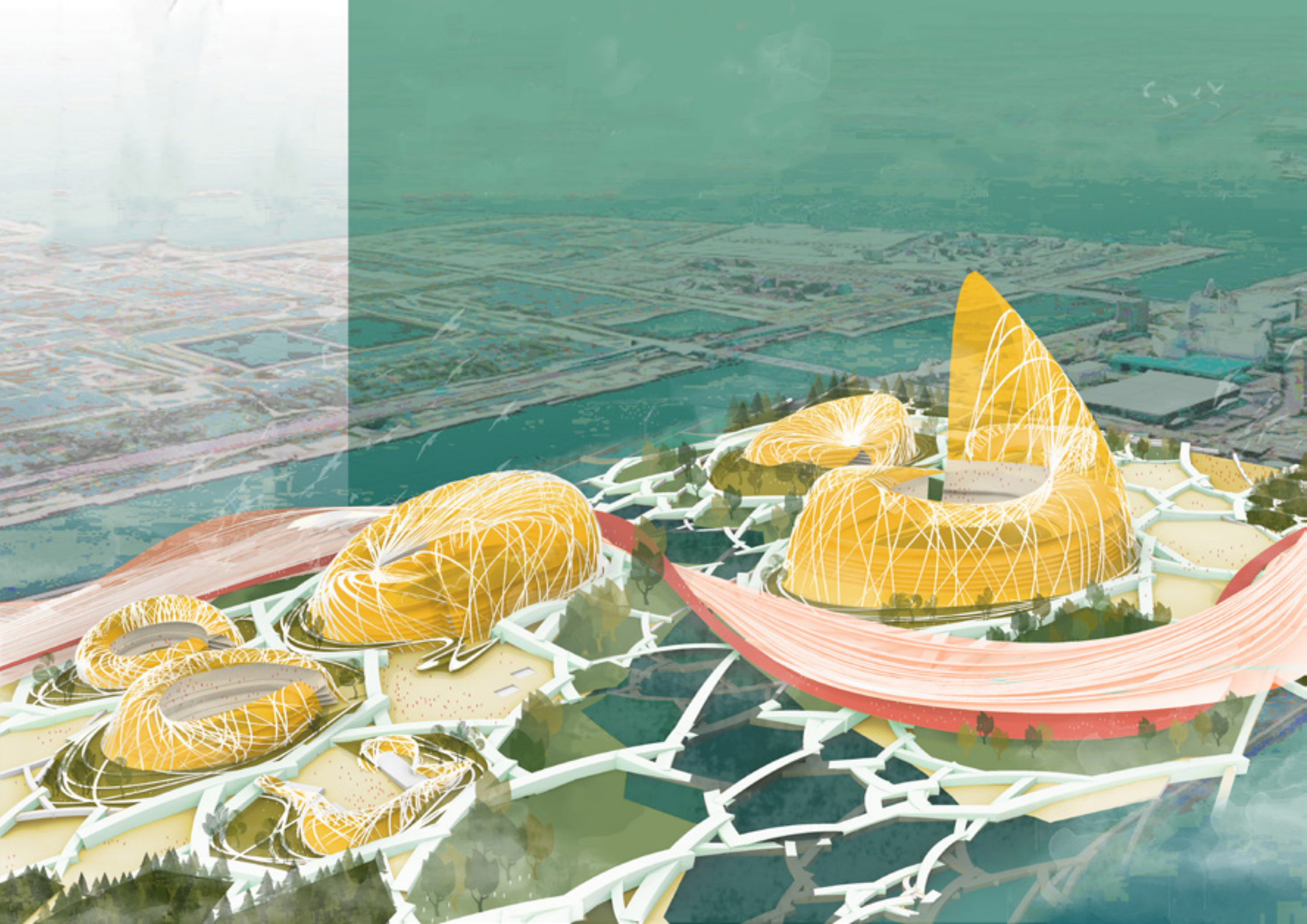
Present - Marathon Track


Future - Performance Center

Future - Exhibition Center

Future - Hotel


Future - Outdoor Concert



Project 4

CAISHIKOU 2035

Group work
Instructor: Jian Liu
Cooperator: Yixi Shen
Site: Caishikou, Xicheng District, Beijing
Autumn of 2018

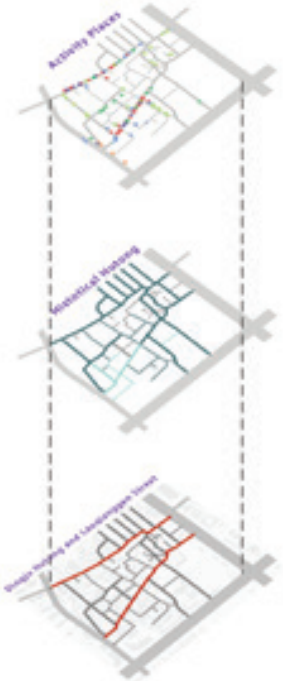
宏观条件/Macro Conditions

历史溯源/Historical Retrace

中观条件/Meso Conditions

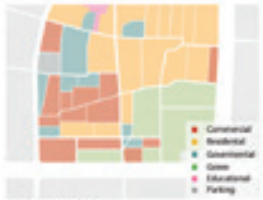
微观条件/Micro Conditions

线性要素/Linear Elements



面状要素/Area Elements

Attribute of Roads



Situation of Land

Preserved Architectures

Function of Architectures

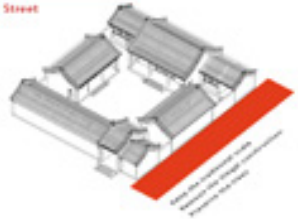
Public Space

Green Space

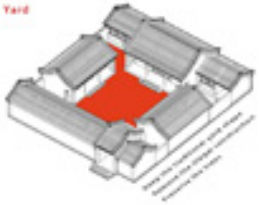
Preserved Rule

Evaluate the traditional architecture and select the parts need to be preserved.

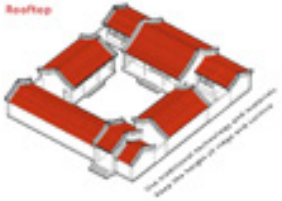
Street



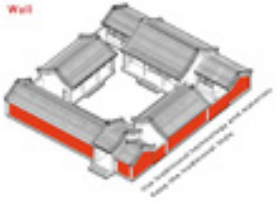
Yard



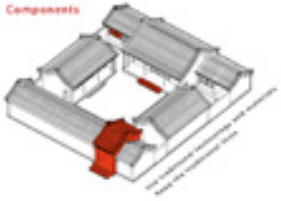
Rooftop



Wall

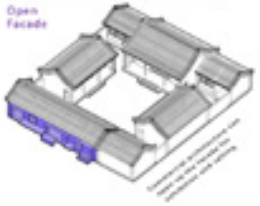


Components



Commercial Architectur

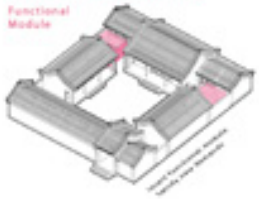
Open Facade



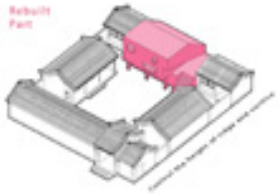
Residental Architectur

Small-scale and gradual renovation.

Functional Module

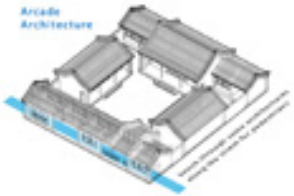


Rebuilt Part



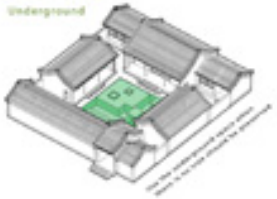
Along the street

Arcade Architecture



Expansion

Underground

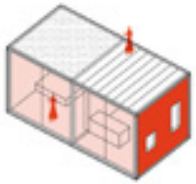


The Second Floor

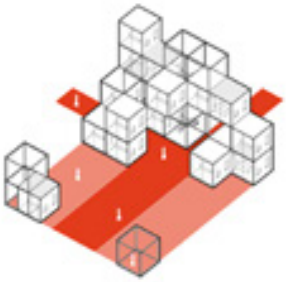
Architectural Expansion

Low-cost Housing

A household Modules

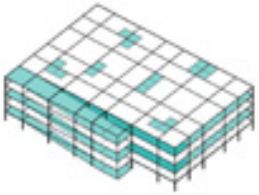


Households Frame System



Plaza Open Space

Public Architecture



New-built Frame System

Collective Housing

A household Module I

A household Module L

Households Entrance

Yard Preserved Tree

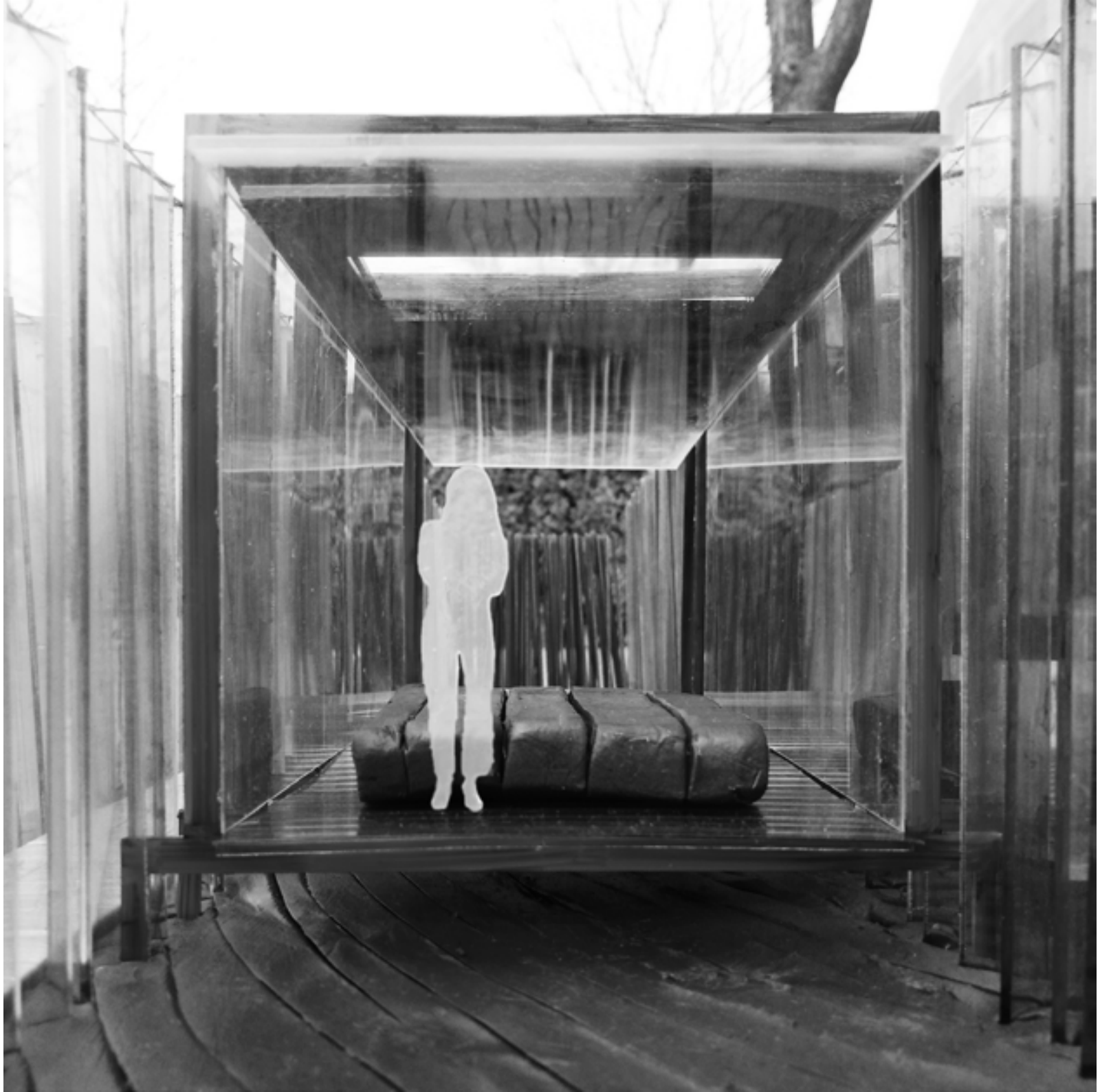
Street Yards

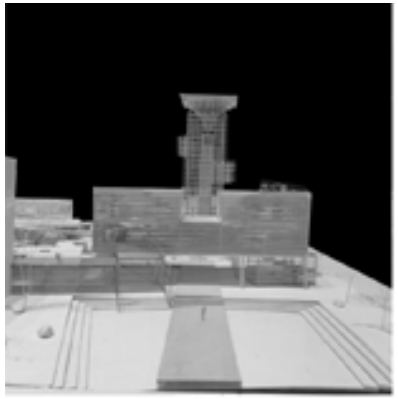
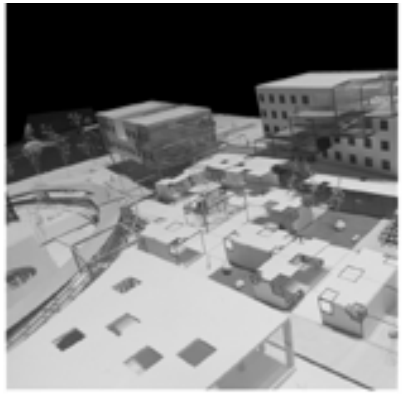
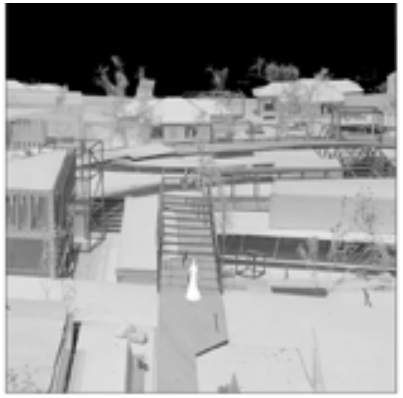
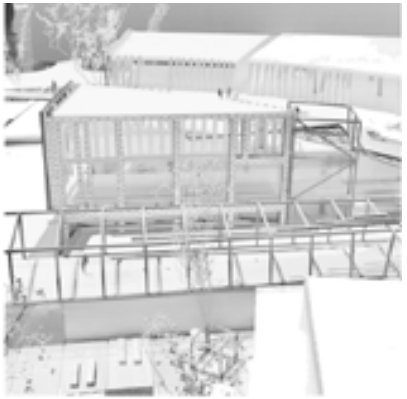
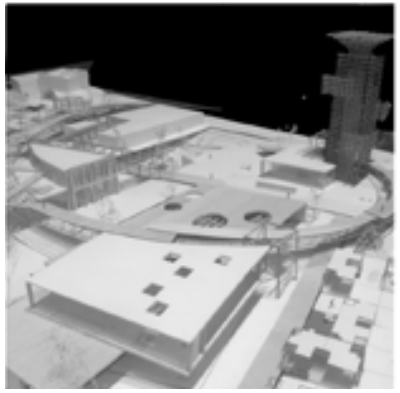
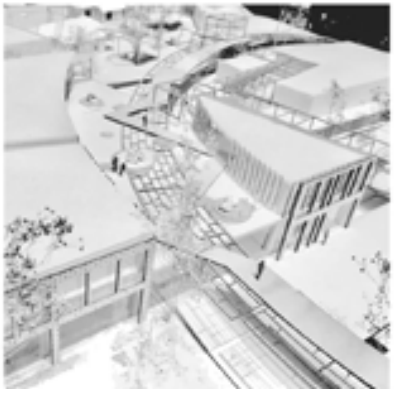
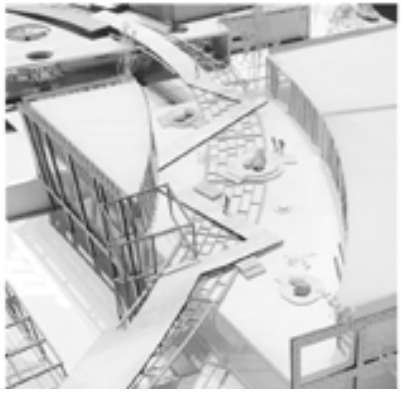
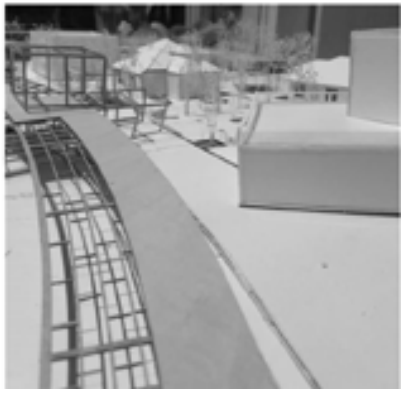
Renovation Insert Modules

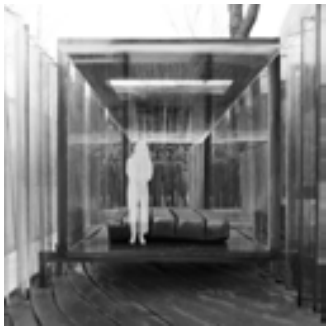
Other Work

HANDMADE MODELS

(After Photoshop)





THANK YOU

韩玥君　Yuejun Han

2015 - 2020