Architectural Prescription

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PORTFOLIO GSAPP 2022
01 UN-DETAILING
Possibility Makers - A Flexible Carriers System Design
ADV Studio V, Autumn 2021
Mentor: Andres Jaque

02 94 DAYS
Documents of Sunlight
ADV Studio VI, Spring 2022
Mentor: Stephen Cassell, Annie Barrett

03 COUNTERCOLLAPSE
Rethink Collective Life in Octagon House
ADV Studio IV, Summer 2021
Mentor: Ignacio G. Galan

04 COMPUTATIONAL PRESCRIPTION
Program Solution for A Canopy Design
Technology Elective, Autumn 2021
Mentor: Danil Nagy

05 FACADE DETAILING
Terracotta Sunshade & Pre-tension Mullion Design
Technology Elective, Spring 2022
Mentor: Kevin Schorn

06 FOOD DESERT
Points Unknown - Storytelling with Web Mapping
Visual Studies, Spring 2022
Mentor: Juan Saldarriaga Chaux, Michael Krisch
UN-DETAILING
Possibility Makers - A Flexible Carrier System Design

GSAPP Autumn 2021
ADV Studio V

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Chapter 01-
**Power is in Details**
Wheels in the shed/ Cost of moving/ Power in wheels

Chapter 02-
**Dissident Prescription**
Technology reconstruction of details/ Social reconstruction of details

Chapter 03-
**Performance of the Possibility Makers**
Dead-end/ Stations in use/ By the water
What can be done publicly with limited funding of $550 million?

The Shed gives one answer: It is a cultural center in Hudson Yards. It is mobilizing a huge amount of resources - $550 million, maintenance fee every year, and 11 years of development. The Shed is full of wheels, which makes it move, but also means additional cost.

In our project, we are counter-doing and constructing alternatives to the Shed with the funding limit that was invested for the Shed. But this one is intended to be, not only financially flexible but real flexible. We are taking advantage of the existing rail system, and coming up with a new design of carriers traveling on it to offer flexible public space to people who need it.
Wheels in Shed

The Shed is full of wheels. Eight bogies wheels at the bottom and a rack and pinion system on the roof of the base building allow the Shed to deploy on a rail. The toothed wheel system allows the Shed to operate the side windows and shade and the wheel and track of the window cleaning machine on top.

Cost of Moving

Moving is a big thing for the Shed, but moving is also making things complicated, it means additional cost. The dynamic conditions will lead to thicker beams and more columns of the foundation, more steel materials in the deployable frame, and a more complex structural system.

Power in Wheels

The Plaza of occupancy when the Shed is deployed is not included in the building area of the Shed. During the project approval process, the Shed is described as a canopy, so that it is able to legally occupy the public plaza. Its real attitudes against the public are contradictory to its concept of flexibility.
Redesign Details

We are counter-doing and constructing alternatives to the Shed with the funding limit that was invested for the Shed. But this one is intended to be, not only fictionally flexible but actually flexible.

Here is the Possibility Maker. Each of them has an engine to support its transformations, and all the mechanical systems in the Possibility Maker learn from the Shed, but on a smaller scale and are used with different proposals.
Possibility Maker is intended to be a non-profit and organic supplement to the city. Different from the Shed, art is not seen as autonomous products here, but instead, intersectional paradigms. These carriers work as organic supplements to the city with public services like education and training, environmental protection, daycare, legal supports, etc. The invention is intended to be flexible enough to transform based on what people really need.
New System with Existing Rail Tracks

The map shows that those who need public space are in the areas out of Manhattan Island. Taking advantage of the existing rail system, we summarized three systems, within which all rails are connected. New carriers will be traveling on the rail system, and the new invention will be flexible enough to offer different types of public space to the whole city.

Day and Night - Unfolding Publicness Across the City

The carrier systems require three different management systems: under MTA's management, cooperates with some NGOs, and one online to respond to immediate needs. During daytime hours, the cars follow the schedule of the subway system and stop at stations. Periodically, they converge on the railroad's dead-end to host events. At night, the carriers stop at the polluted waterfront while the water purification system is activated.
Sunnyside Yard

The first condition is in the dead end. It provides space for long-term deployment and a place for the rail-to-road transition. Outer wheels can be attached to the gears and help the car to leave the rail.

Sunnyside Yard Queens is in a diverse neighborhood with a number of schools around. In March 2020, a new Sunnyside Yard Master Plan was released by the city, one goal of which is to establish seamless job training-to-employment pipelines for those who live or receive education in the area. The master plan may still take years to come true, but the demands have already been here. According to the research, there are huge demands on the job training and workforce development. Therefore, before the new master plan is constructed, possibility makers can serve as an urgent transitioning response. They will come to the area, expand themselves, connect with each other and offer platforms for education and training, babysitters for people who come with their kids, and shared kitchens for dining.
Sunnyside and Elmhurst

The second condition is the station use. Library circulation among students in Sunnyside and Elmhurst is higher than the average of New York City. However, the library budget in this area is at the lowest level in New York City.

Therefore, we set some of the travelling carriers passing through stations in this area as libraries on rail to supplement the gap between budget and usage. When Libraries in Sunnyside and Elmhurst receive requests for books they don’t have, they will contact libraries in Manhattan.
**Stations around Manhattan Libraries**
Library staffs will bring all the ordered books to the carriers with a book shipper.

**Traveling**
Books ordered by readers and pick-up books will be placed on the different side.

**Stations in Sunnyside and Elmurst**
When the carriers arrives at the stations in Sunnyside and Elmurst, people can pick up their books or read in the car.
Jamaica Bay

The third condition is by the river. There is a pollution problem in Jamaica Bay. Several wastewater treatment stations are located along the watershed. So, when demand for public service is low at midnight, Possibility Makers will be dispatched to the waterside and cooperate with NGOs to help purify the water.

The carriers will come and park at the newly constructed rails on the beach of JFK airport, which is in a major polluted area and has no current programs ongoing. The trash collectors are fixed on the rails to collect trash and dead seaweed, and when the cars come at night, pipes on the cars will be connected to the collectors, and the purification will start. The carriers will be grouped into three, one of which has a water purifier installed and use its engines to pump water from the Bay. 300 million gallons of water will be purified by 1200 cars every night.
1. Sedins
2. Fixed pipes
3. Retractable water pipes
Chapter 01.

Document of Sunlight
Alman Mater/ Light and Form/ Bright and dark/ Perception of the shape

Chapter 02.

Changing Cubes
Cubes/ Colors and Shapes/ Interplay of light and color/ Changing space

Chapter 03.

Central Park Climate Lab
From square to circle/ CLT folded panels/ Nature/ Light forms space/ Ambiguity
**Everyday**

The project investigates the exact effects of the diurnal cycle that defines each single day, and the interplay of sunlight and space.

**Practice**

Rather than focus on the singular culmination end of a design, the project is divided into three parts and concentrates on the recursive practice of creation – a practice that builds on itself.
Light and Form

The formation of our visual image depends on the interaction of sunlight and objects. Light brings bright and dark relationships and different bright and dark colors influence our perception of the real object.
Colors and Shapes

What happens if subjectively change the relationship between the bright and dark of an object?

If an object is given a different color, the reflection of the image in our vision may deviate, thus creating an optical illusion.
Boxes with Three Colors

So what would it look like after combing these small boxes with different corners and colors?

This is a space formed by nine cubes put together. Each cube has a hole in the corner, which is the part where they are connected to each other and the part where the light comes in.

Three different walls, translucent white frosted glass, light gray walls, and dark gray walls are selected for the walls of each box depending on the orientation.
Changing Room

Although the whole building is symmetrical. Our perception of each space is different when walking between different cubes due to the influence of colors and light. The whole building became an ambiguous and ever-changing space.

Interplay of Light and Colors

The light and shadows will add another layer of color to the object. Sunlight may sometimes allow us to see their true shape, and sometimes the light and shadows enhance our illusion.
The Building As An Amplifier of Sunlight, Time and Nature

The third part is a design for Central Park Climate Lab, based on a newly founded program belonging to the Central Park Conservancy. The building will provide office space for the researchers to study the impacts of climate change on Central Park and an exhibition space to showcase the new research. Also, the architecture works as a space to connect visitors with nature and highlight their senses and emotion as they walk through the building.
**CLT Folded Panels**

Folded CLT panels work as main structure in the building. By folding, each facet reflects light in a different direction, resulting in different appearances and shapes. Also, changing their shape, division, and height will create more light and shadow effect.
Walls with Different Materials

Continue to explore the interaction between light and colors. Each wall made up of three different colors panels. Two dark opaque wood panels and one light translucent panel. When placing them under sunlight, the comparison between the original wall and the wall with various colors shows that the triangular shapes become unclear. Also, the concave and convex relationship becomes ambiguous.
Different Light Sources

For indoor space, there are three types of light sources. The first is direct sunlight coming through the openings. The second type is light coming through the gap between the folded wall and the floor, which brings a softer shadow. The third way is light through the translucent material.
-1 Floor plan

01 office
02 exhibition
03 courtyard
04 auxiliary space
Light Forms Space

The dark panels affect our perception of shadow, while the translucent material show distinctly different colors and brightness when influenced by light from other direction.

These variations together blur the appearance, form and space. At the same time, the continuously changing effect highlights the visitors’ sense of the sunlight and connection with the nature.
COUNTERCOLLAPSE
Rethink Collective Life in Octagon House

GSAPP Summer 2021
ADY Studio V

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Individual design

Chapter 01-
Trigger
Life Scenes of Grandma Yang

Chapter 02-
Controversies
Growing Elderly Care Gap/Models

Chapter 03-
Rethink Collective Life
A brochure design
By renovating the Octagon House, the project tries to counter the medicalization of aging, promote intergenerational interaction and rethink collective life.

Collapse of the Traditional Family-oriented Elderly Care System

Due to the “one child” policy in the 1980s in China, the pressure on working adults to take care of the aging population has intensified which will bring more challenges to the traditional family-oriented elderly care system. At the same time, the problem of isolation from the growing population of empty-nest elderly and immigrant elderly is becoming more and more obvious. As a result, the exploration for elderly care and the improvement of the existing facilities are necessary.

Octagon House as a replicable intervention in different contexts

The project focuses on the Octagon Center, a long-term care center for the elderly in Youting Village. By renovating the building, the project tries to promote forms of sharing, collaboration and intergenerational interaction. A care center is no longer a place where the elderly resist going to live, but a place where they can enjoy collective life, maintain social ties and realize their values. Since the Octagon Center is privately managed, we imagine we would develop a brochure that simultaneously presents our proposed intervention to them but could also offer the Octagon center in Youting village as an example for a new approach to transform existing nursing homes into independent assisted living facilities. This manual will be promoted in Shenzhen, and even nationwide as a reference for other care centers.
Life in the Countryside

The project begins with observing the changes in the life of my Grandma Yang. She used to live in the countryside, a community where everyone was familiar with each other. She likes growing flowers and vegetables. She always sits in the courtyard and chats with her neighbors.

Life in the City

When my grandma got old, she followed her children to migrate from the countryside to live in the city. The environment around her changed. Grandma feels lonely sometimes. She lives with assistant Mo, a middle-aged woman from the rural area with a little professional train.
Growing Elderly Care Gap

My grandma’s life is a snapshot of many elders living in big cities today. The problem of isolation from the growing population of empty-nest elderly and immigrant elderly is becoming significant.

“China’s Hidden Crisis: A Growing Elderly Care Gap

My child’s generation is the country’s first generation of single children. They’re going to deal with huge pressure.

- Huang Enain, Shanghai resident

A Care Center or A Hospital?

Similar to many care centers in Shenzhen, the interior layout of the original Octagon center is homogeneous with a dull corridor space. The centrally located nursing service room is similar to a hospital. The whole center is isolated from the community.
Studied modes of elderly care practiced both from local and international contexts. Within these modes, the old people can become more integrated with communities and society, rather than being isolated and the cases will provide us with new ways of thinking about collective life.

**Snack Shop Run by the Elderly**

Silverwood facility, a private senior-living chain in Japan for old people. At the entrance of this facility is an old-fashioned snack store run by the elderly living here and the store is always full of children.

**Story of Seven Women**

This is a story about seven single women in Japan who decided to buy different units in the same mansion, being neighbors and taking care of each other. From time to time, they would cook and share meals.
Counter the Medicalization of Aging

Reorganization of Different Clusters
Our attitude is anti-medicalization of aging which means old people should not be treated as a patient. We wanted to change the dull and monotonous space of traditional nursing homes and transform the care facility into a place where different forms of collective living can be rehearsed.

Decentralization of the Shared Space
Prioritize accessibility of place, circulation, services to ensure that the care center is physically, socially accessible for everyone. Decentralization of the service space to create a space that encourages the elderly with different physical conditions to be able to socialize without barriers.
Room Selection List

We offer three types of rooms: single rooms, double rooms and rooms for elderly requiring an assistant.

- **Name**: Yang
- **Age**: 90

### Room Types

- **Double rooms**
- **Single rooms**
- **Rooms with assistants**

### Floor Plans

- **Double rooms**
  - 1 Bedroom
  - 2 Living room
  - 3 Bathroom
  - 4 Balcony

- **Single rooms**
  - 1 Bedroom
  - 2 Living room
  - 3 Bathroom
  - 4 Balcony

- **Rooms with assistants**
  - 1 Bedroom
  - 2 Living room
  - 3 Bathroom
  - 4 Balcony
  - 4 Nursing Room
Countering the Medicalization of Aging
Reorganization of Different Clusters

Generic list - Start to Design Your Room!

- Cork material
  Implement the cork in the interior design as much as possible, creating a soft and warm environment.

- Handrail
  Installation of handrails in corridors and places where the elderly move around.

- Activity area division
  Use different colors to emphasize different areas to help seniors identify the space.

- Self-arranged space
  The common area in front of the single room is shared and designed by the seniors who live there.

- Accessible restrooms
  Bathrooms meet the needs of accessibility and with the help of assistants.

- Balcony
  Combination of the balcony and vertical planting, with the partial extended platform.
Balconies around individual rooms provide more space for the us to move around.

Self-arranged space becomes a calligraphy showcase

Planting makes my life more interesting!

Corridors become space for us to communicate.

Shared Kitchen is comfortable and it enables me to cook myself and share with others.
Connecting with the Community

Besides, we hope to promote more intergenerational interaction through our intervention on the ground floor and rooftop to ensure that the care center is not only physically but also socially accessible for everyone and creates connections with the community.

Open ground Floor
We will open the ground floor of the building and promote collaborations with different social organizations. Following what we learned from the candy shop in Japan, the shops or and facilities could be run by the elderly themselves. Seniors can continue to realize their values through participation.

Rooftop Farming
The results of the survey show that many of the elderly used to be engaged in agriculture, which means they have a lot of farming experience. Many seniors move from rural to urban areas, and rooftop farms give them the opportunity to practice their skills and, at the same time, serve as a place for them to engage in social interaction.
Connecting with the community
Survey on Yuanling Village

Map of Yuanling New village
According to our research, there are two schools in the vicinity of Yuanling New Village, which means that there are a lot of students around Octagon House.

Survey for the elderly in Yuanling New village
A survey on the daily activities of the elderly people of Yuanling New Village would help define some common and public spaces. The results of the survey showed that many of them used to be engaged in agriculture. At the same time, in Yuanling New Village, forty percent of the elderly have a high school education or above.
Connecting with the community

Rooftop Farming

Greenhouse for Healthy Salad Workshop
- Light
- Humidity
- Transparent cloth
- Organic vegetables

Greenhouse for Natural & Botanical Dye
- Light
- Humidity
- Transparent cloth
- Dyed cloth

Greenhouse for Easy DIY Succulent Planters
- Light
- Humidity
- Transparent cloth
- Succulent plant

Greenhouse for Mushroom Farming Class
- Light
- Humidity
- Shade cloth
- Plastic bag

YES | 2021 Octagon House’s Summer Farm
Jul. 21, 2021

Know more about our workshop:
- Natural & Botanical Dye
- Easy DIY Succulent Planters
- Mushroom Farming
- Healthy Salad

How to get involved:
You may choose a proper way to get involved as individual volunteers, school groups or enterprise partners. Get involved today!

Register or support
Connecting with the community

Open the Ground Floor

Recreation area on the open ground floor is good for my grandchild to play and stay with me.

Bookstore is where I like to stay most of the time and it is popular among the community.

The Candy shop is where I work and I enjoy the job.

Ground Floor / Community Level
COMPUTATIONAL PRESCRIPTION
Program Solution for A Canopy Design

GSAPP Autumn 2021 Technology Elective

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Step 01:
Space Division
Circulation of the people / Sunlight

Step 02:
Plan Layout
Tables and chairs / Space capacity

Considering the circulation of the people, sunlight and interior space capacity, the project use computational method to redesign the canopy at Columbia University. By creating algorithm models in Grasshopper and using Discover a grasshopper plugin to optimize the result, we finally get the best result.
Algorithm Model Analysis

In the first stage, the goals are optimizing the circulation and maximizing indoor lighting conditions. We created the algorithm model to get the minimum total path distance, minimum total distance from the center to the boundary, and the maximum dining area.

Optimization in Discover - Performance Matrix

By giving continuous parameters for different paths to simulate the flow of the paths, the results are optimized and calculated in the Discover by the set objectives. Finally, by comparing all possible results that appear in the performance matrix we can get the optimal solutions.

Algorithm Model Analysis

In the second stage, we try to maximize the space capacity by repositioning tables and chairs. We set the size of individual table units and then place an array of units covering the base area. Input a group of continuous numbers to move and rotate the array, then calculate the number of tables each time.

Optimization in Discover - Performance Matrix

In this step, the objective is to get the maximum number of tables. By connecting our algorithm model with Discover, all the results are shown visually from the matrix. In this diagram, the result with the largest Y value is the best choice.
The double-layer facade system uses terracotta as sunshade and mullion. The detail design focuses on the pre-tension mullion with rod inside and its connection with roof, floor and terracotta sunshade.
After reviewing the most incident factors related to food availability in Sandtown, it is possible to notice the severe damage caused not only for structural scarcities and racial injustices occurring since the 1970s but also because of an extreme food desert that harms the existing population affecting them with health complications. There aren’t enough markets nearby where the residents of Sandtown could buy fresh and healthy food, but they also have to commute long distances, wasting time and expending extra money. On top of that, the existing supply in the neighborhood is extremely low, directly affecting the entire population of Sandtown, especially the most vulnerable people. But, there isn’t only bad news. Even though the implemented food programs aren’t having much success until today, there is a positive signal on the variety of programs that the Baltimore City Health Department is applying in conjunction with the Johns Hopkins Center for a Livable Future along with the Bloomberg School Of Public Health. Programs such as the Baltimore, the Virtual Supermarket Program, the Healthy Stores, the Food Justice Forum, the Baltimore Food Policy Initiative, and the Mapping the Food Environment are trying to revert these issues. Hopefully, in the near future, these public initiatives and other types of programs could start to change the reality of this postponed neighborhood.
In 2015, the Sandtown-Winchester community of Baltimore was the scene of a tragic incident. Freddie Gray was arrested and later killed by the police. This event, among others, highlighted the ongoing struggles faced by residents of the neighborhood. The history of decay in Sandtown began in the late 1960s, particularly after the May 68 riots and the increase in drug use and violent crimes in the 1970s, which led many residents to relocate. Despite government efforts made since the 1980s, the situation has not improved. Before this, Sandtown was known as "Baltimore's Harlem" and inspired many cultural expressions across the US. Today, it's easier to see the decay of the neighborhood in the high percentage of vacant buildings, a high percentage of working-age residents unemployed, high rate of community population incarcerated, a low average household income, and many cultural expressions across the US. Today, it's easier to see the decay of the neighborhood in the high percentage of vacant buildings, a high percentage of working-age residents unemployed, high rate of community population incarcerated, a low average household income, but especially in the high percentage of area covered by food desert, which is complemented by an insufficient provision of healthy food among the existing markets and grocery stores. So, even though the Baltimore City Health Department and the John Hopkins Center for a Livable Future have started research and programs, their implementations and the urban renewals haven't had any positive repercussions on the community of Sandtown so far.
The video above displays a daily trip of one resident throughout Sandtown searching for healthy food which is meant to expose the quotidian dilemma of the residents of Sandtown.