U.S.-Mexico border has always been a place full of disputes and complex issues. Military, biology, environment, trade, cross-border flow of people constitute the complexity of the border. With economic globalization, cross-border trade activities are more and more frequent across the border. Therefore, this project focuses on the cattle trade industry chain across the US-Mexico border, trying to construct a new multi-level structure of cattle industry chain to solve the instability of the existing single industry chain and improve economic benefits. At the same time, fully respect the lives of cattle, so that they can have a happy life. Then taking Columbus, a small town near the US-Mexico border, as an example under the new industrial system, setting up a cattle corridor to protect cattle rights and to reshape and develop the small town, activating tourism, education and leisure functions, and promoting the development of cattle-related industries.
Infrastructure system and future urban plan
Cattle corridor reshape the town

Cattle corridor
We used the concept of rotational grazing to establish a cross-town cattle corridor which includes 3 paths where cattle can only have access to one path in each season, so that the soil can be fertile and avoid over-pollution. Tourism, education and leisure functions will be formed around the corridor which reshape and develop the small town. Then the system of cattle-related facilities and industries will be constructed which includes fertilizer industry, cattle by-product companies, grain feed companies and water purify plant.
Bringing opportunities for interaction between human and cattle through landscape design on the corridor, making it a tourist attraction and animal education space. Installing noise-reduction facilities to make the corridor more comfortable for cattle.
02 Food Campus

Food court + Food education + Food factory + leisure park

Building area: 5600m²
Site: Flushing, New York
Instructor: Phu Hoang

Team leader
Team work with Wenxuan Xu
80% work of drawings
60% work of model
90% concept design

Flushing, the Chinese immigrant settlement in New York city, is now facing the serious gentrification trend which leads more and more small businesses to close down or have to move to the basement where the rent is cheaper. In addition, because of the Covid-19, it is especially difficult for the small food businesses to survive. Most food businesses are special Chinese restaurants or food carts which are very important for the Flushing because it is they that make up the Chinese characteristics of this community.

Therefore, our project is to establish a Food Campus that gathers various food businesses, and combine with food education and a food processing plant to create a new business mode which can preserve and develop small food businesses.
The basement, as a basic spatial prototype, was initially built as service rooms or storerooms, which is private and regarded as ancillary space of the house. But under the recent gentrification trend in Flushing, housing price and the rent become higher and higher which forces the immigrants give the basement new functions and challenge the maximum utilization efficiency of buildings, which creates many anti-typological basements. They try to live, work and have entertainment underground and transform the entrance facade to activate the hidden business, which shapes the informal urbanism in Flushing. However, in the process of gentrification, even basement rents become expensive, which leads to the closure of many basement restaurants.
Gentrification V.S. Localization

Solution

New business mode

- Food processing plant

- Small restaurant

- Online selling

- Food education

- Abundant programs
- No need for restaurants to drive far to the market to buy ingredients
- Reduce carbon emissions
- Provide pre-processed ingredients for restaurants
- Increase efficiency
- Establish E-commerce selling platform

Benefit

- Gain more income and exchange sales

Develop and preserve food business

- Superior Apartment plan
- House Value Index
- Flushing, Shanghai, Manhattan, New York
- House prices in Flushing are getting higher and higher.
- The number of people has caused the demand in Flushing. In order to adapt to the trend and maintain the life, people built more shops and offered more opportunities.
- The rise in housing prices has led to higher rents, small businesses are unable to afford rents, and many traditional food stores have moved away to Flushing.
Redundant circulation
multiple circulations in or outside the building
Extra space in the circulation for other activities
03 Dance with Birds
Bird Sanctuary design

Building area: 7140 sqf
Site: Los Angeles, US
Instructor: Laurie Hawkins

Individual work

This studio speculates on a site at the Los Angeles River and the Sepulveda Basin in the greater Los Angeles. It analyzes this complex and extra-large-scale physical environment through many trajectories: geophysical, historical, environmental, technological, political, cultural, and economic.

Starting from the scale of regional planning, the project firstly establishes a leisure, entertainment, cultural and educational system serving the surrounding community based on the existing natural and biological conditions of the site, and transforms the topography of the site to deal with 100-year flooding. Then focus on designing an island bird sanctuary, combining aviary, bird gallery and bird research and breeding institution to protect endangered indigenous birds and publicize bird knowledge to the public, thereby further raising environmental awareness. At the same time, by exploring the spatial relationship between the aviary structure, architecture massing and the elevated path, to create various bird watching experiences and various possibilities of interaction between visitors and birds.
Relationship between aviary, building and island
Multiple circulation

Visitor entrance

Staff entrance

1F Bird kitchen/ Research office/
Breeding room/ garbage room/
Veterinary

Quick entrance

Main entrance

Lecture hall

Exhibition space

2F Lobby/ Exhibition/ Lecture hall
Roof level

3F Exhibition space
Different aviary experience

- Inside aviary/ Far away from the net
- Inside aviary/ Near the net
- Inside building/ Look out
- Outside aviary/ Overlooking the aviary
- Outside aviary/ Surrounded by net
Selectives
Team work with Yingying Zhou

Vray for 3d Max

Techniques of the Ultrareal

2021 GSAPP fall selective

Rendering work

Role in team: Making model, Render, Photoshop
How do you fill a room with plants?

generative design
## Data input

<table>
<thead>
<tr>
<th>Plant type</th>
<th>Calathea</th>
<th>Sansevieria</th>
<th>Nephrolepis cordifolia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount number</td>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
<tr>
<td>P=price( $ )</td>
<td>60</td>
<td>140</td>
<td>80</td>
</tr>
<tr>
<td>R=plant radius(inch)</td>
<td>6”</td>
<td>9”</td>
<td>15”</td>
</tr>
<tr>
<td>Lux=lighting need</td>
<td>1400</td>
<td>1900</td>
<td>2200</td>
</tr>
</tbody>
</table>

### Behavior logics

**Behavior1: Clustering towards daylight areas**

**Behavior2: collision**

$$d_1 + d_2 > \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$$

- Areas that meet plants light need
  - $L_{room}$: light need of plant
  - $L_{light}$: light need of plant

Based on the lighting data produced by the climate studio, plants will be scattered to areas with local $L$ values larger than $L_{room}$.
Plant placement area generation

Sunlight data collation

Avery 600 South
Climate studio
Export to excel

Store sunlight value in points
Elevate points base on lux value

Point cloud generation
Generate surface base on points

Sunlight data visualization

Plant type
Lux requirement
Cut surface
Applicable surface

Generate control points

Mapping plant placement points

Cathaya
Sansevieria
Neptholepis cordifolia

1400 Lux
1900 Lux
2200 Lux