This is a catalogue of explorations in Revitalization. Resiliency. Reinvention. Remediation. Regeneration. Readaptation.

This is a catalogue of my interests in architecture.
| 01 | REVITA-LOT | URBAN INTERVENTION |
|    | takara beatilium |
| 02 | PS64 | GREEN INFRASTRUCTURAL SCHOOL |
|    | tactile traction |
| 03 | HOME//WORK | NEW HOUSING TYPOLOGY |
|    | irregular |
| 04 | RESTORE & REWILD | COMMUNITY HUB |
|    | rai: the fungal bot |
| 05 | EXTRACTIONS OF TOMORROW | MATERIAL ECOSYSTEM OF DUNE SAND BIO-BRICKS |
|    | ma'dan tribes of iraq |
| 06 | GROUND MATTER | ART & DESIGN INCUBATOR |
This is a catalogue of explorations in Revitalization.
Resiliency.
Reinvention.
Remediation.
Regeneration.
Readaptation.
Located primarily along Broadway in Manhattanville, the project proposes a revitalization of privately owned, narrow empty lots to serve the typically under-served community of the previously incarcerated.

These ‘urban voids’ are a typology that exists throughout the city of New York and are often forgotten and left undeveloped.

The project proposes a design strategy that could revitalize such underdeveloped urban voids to be used by NGOs to provide their services to the public. By choosing the typical typology of the empty lot in NYC - an infill lot - the project proposes a structure that inserts itself into the void, using the neighboring buildings as a structural support. As a result, it is able to lightly occupy the private lot, almost hovering over it.

Symbolizing impeding displacement, the scaffolding carries a negative connotation of gentrification in neighborhoods. This project uses it as a tool that brings positive change to the neighborhood and its inhabitants and not negative.

The design capitalizes from its easy constructibility as an asset for easy deployment onto the various urban voids present in the neighborhood. The scaffolding provides a structural framework that enables various programs to be inserted within it and allows for a gradient of porosity through the program as one ascends through the project.
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Revitalization
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SCAFFOLDING SYSTEM

- MODULE CONNECTION DETAIL:
  - STEEL TRACK
  - HEX BOLT CONNECTIONS
  - CONDUIT PIPE WALL SLEEVES

FACADE PANELS:
- RECYCLED WOVEN PLASTIC BAGS
- WATER BARRIER
- 1" RIGID INSULATION
- 1/4" PLYWOOD INTERIOR

FLOORING SYSTEM:
- 1/4" FLOOR FINISH
- RUBBER SOUND ATTENUATION
- 2" PLYWOOD FLOORING

MODULE PLYWOOD WAFFLE STRUCTURE (BEYOND)

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Case study of the Takara Beautilion Pavilion of the Metabolist movement at the 1970’s world expo. The modular construction allowed for a quick framework into which prefabricated modules were inserted. The generic framework can host multiple program variations, proving that the identity of the structure comes forth by the human interaction and occupation.
tangential explorations

conceptual model

animated modules
This is a catalogue of explorations in **Resiliency**.

Revitalization.
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The new PS64 integrates itself into the LES as a mega green infrastructure that is able to participate within the community by being more than just an educational institution. The integration of green strategies like bioswales, rainwater collection, and on-site composting not only creates a sustainable pedagogical shift within the school, but also allows it to serve the community as a whole by integrating itself into an existing network of community gardens serving as flood mitigation zones.

The conventional class room model is replaced by ‘LEARNING ZONES’ that are paired with specific green strategies based on the type of learning that these found infrastructural pieces provide formally.

Scaled-up and color-coded versions of ‘found’ green infrastructural elements like water filtration tanks or composting drums are not only embedded into the mass of the existing school building but also into the pedagogy of the proposed school.

These zones are meant to allow for learning to take place as an interactive practice, where students are immersed within their study of sustainable practices. The color coded spaces become a visual aid to show these strategies interact with each other in a larger system.
This is a catalogue of explorations in Resiliency.
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Tactile Tractions are a unique five-sided irregular brick. The irregularity of the form and the surface striations allow for varied tiling opportunities creating screens of varied shapes and openings. Not only do the striations provide textured variation, but they also act as a connection detail through the traction provided by its tactility.
tiling variations
This is a catalogue of explorations in Reinvention.
Revitalization.
Resiliency.
Remediation.
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Readaptation.
Thinking of housing in terms of incomplete/complete prioritizes thinking of systems over architecture. For our proposal, we frame the completion of housing through the coalescence of work within the domestic realm.

Living with COVID has stretched the role of housing by collapsing living and working in the same space. Current housing models do not allow for such a co-existence to occur without significantly altering living conditions. In this temporary, yet new normal, how can we design for not only a flexibility of living, but also for one of work?

Home/Work is a new typology of housing made up of a series of skinny towers housing units where living and working can coalesce.

We propose framing the home as an agglomeration of expanded mechanical systems that wouldn’t normally be found in a multi-unit apartment building, in order to provide flexibility more akin to a high-tech office space.

This takes place within a raised floor system supported above CLT slabs and bar joists. The joists provide a depth that enable opportunities for sectional differences of the raised floor system that clear the structural and mechanical grid.

This system allows for occupants to pursue various work life combinations that would otherwise be not possible in typical housing; the unfinished condition of the unit holds a world of possibilities for the occupant’s needs.
This is a catalogue of explorations in Reinvention.
This is a catalogue of explorations in

Reinvention

03.04 FRAGMENT MECHANICAL NETWORK
03.05 GROUND & TYPICAL FLOOR PLAN
This is a catalogue of explorations in Reinvention.
This is a catalogue of explorations in Reinvention.
This is a catalogue of explorations in Reinvention.
Irregular is a spatial optimization exercise exploring the best way to optimize organization of New York City’s varied irregular plots. The size and irregularity of these plots have often left them underbuilt or underutilized. Using Python and Grasshopper to identify potential party walls and window walls of the plots, we were able to create a script that would subdivide the plot area to create a 2 bedroom housing unit. By running the script through a Genetic Algorithm optimization, we were able to test the script to produce spatial organization that produced minimum sized rooms to code in reference the plot’s formal irregularity.
tangential explorations
This is a catalogue of explorations in **Remediation**.

Revitalization.
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Restore & Rewild aims to look closely at the needs of each town in Ulster County and strengthen the community in three steps: resiliency through health, security through food and nutrition, and sustainability through secure livelihood and land. In Ellenville, this includes focusing on at-risk youth and young adults who are looking to further their education and gain the skills to participate within the larger community.

Located on what used to be a metal manufacturing facility’s concrete pad, the project begins as a rapid deployment of several vaccination centers and a series of phytoremediation strategies as a way to begin to restore the health of both the community and the land.

By planting within the existing exposed column grid of the previous facility and strategically scoring lines for additional plant growth, within the year there will be a natural disintegration of the concrete allowing for smaller blocks to be repurposed or removed from the site.

The project will continue to expand across our site sitting within the remediation process to include programs of urgent care, housing, green career training and in the distant future a small scale timber manufacturing facility.
This is a catalogue of explorations in Remediation
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YEAR 5
PLANTING SLOW GROWING TREES FOR OUTER SITE REMEDIATION
PHASE 3

YEAR 10

YEAR 15
CLT LIGHT MANUFACTURING - COMPLETE REMEDIATION - REWILDING SITE
PHASE 3
This is a catalogue of explorations in Remediation.
In a speculative world in the future where human occupation on earth has left it scarred and toxic, rai: the fungi bot, is the personalized tool that people must carry to undo their marks on the planet. Using fungal computing, rai is able to test the ground for toxicity levels and can thus calculate which fungal spores must be ejected to carry necessary remediation of the land post human activity.
**Fungal Crystal Display**
Laser light show for rave parties or to provide energy on your daytime outings such as picnics

**Slime Frequency Dial**
The frequency dial harness the remediative power of different fungi in order to act on the correct contaminants

**Spongi Body Catalyser**
The frequency dial harness the remediative power of different fungi in order to act on the correct contaminants

**Spores Dispenser**
At the end of the rave after the soil analysis is complete, a cloud of spores is released for entertainment and to rewild the contaminated area

**Soil Sensing Base**
Senses the contamination levels and types of contaminants in the soil where a gathering takes place
This is a catalogue of explorations in **Regeneration**.

Revitalization.
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Extractions of Tomorrow is a two-pronged production ecosystem that promotes light extractive and regenerative methods in production to restore old economies, as well as create new economic opportunities within the Sub Saharan African region. The proposal hopes to reverse the extent of desertification that has led to a large portion of land degradation within the Sub Saharan context, forcing residents to migrate and become national climate refugees.

This project investigates the potential to introduce dune sand as a construction material in an attempt to mitigate sand scarcity in the construction industry today and tap into an already available vast resource, thus reducing pressure on the sand industry and potentially help reduce the spread of desertification across the African, and even global, context.

New research in the past decade has shown the rise of Microbial Induced Calcite precipitation as a new biological process that uses enzymatic reactions of bacteria with urea to ‘grow’ bricks by calcifying around fine dune sand, thus binding it together. Building off of this research, the project proposes the use of Dune sand along with human urine, and bacteria in a zero waste, heat free process to produce outputs of a new type of ‘bio-brick’

The project imagines agencies like the African, Caribbean and Pacific Group of States (ACP) that are partnered with the Green Wall Initiative, to expand their portfolio to assist local communities and governments to sustainably extract desert sand for production whilst also providing guidance to restore and manage fragile ecosystems.
This is a catalogue of explorations in...

**Inputs**
- URINE (20L / 32700g)
- LIME (770g)
- DESERT SAND (483g)
- BACTERIA MIXTURE (7.33kg)

**Process**
- Pump brine through aggregate matrix

**Outputs**
- CALCIUM PHOSPHATE (350g)
- ‘BIO’-BRICK (1180g)
- WATER (67105g)
- LIQUID NITROGEN (8.78kg)
This is a catalogue of explorations in Regeneration
This is a catalogue of explorations in DUNE SAND EXTRACTION AND LAND REGENERATION PROCESS.
This is a catalogue of explorations in...
This is a catalogue of explorations in Regeneration.
This is a catalogue of explorations in Regeneration.
The geographical significance of the Marshlands of southern Iraq, made the Marshes susceptible to the process of modernization, irrigation, warfare, drought and oil extraction. As a result the Marsh Arabs became a displaced marginalized community in Iraq. This research uses critical mapping analysis tools to highlight the ecological consequences on the livelihood of the Ma’dan Tribes through years of conflict and how despite the apparent restoration of the Marshlands, ecological conditions remain unfavorable for their return to previous modes of living - rendering the political move of restoration a failure in essence.
Landcover images showing drainage and reflooding of marshes
tangential explorations

Landcover classification of quality of marsh water

Satellite imagery showing increasing oil field activity

AL HUWAIZAH MARSH

1986

2010

MARSH VEGETATION AGRICULTURE OILFIELD BARREN LAND
This is a catalogue of explorations in Readaptation.
Ground Matter is a prototypical proposal to reimagine the role of adaptive reuse for a decommissioned Coca-Cola Bottling Plant in Houston, Texas. The project responds to the urban condition of impervious surfaces prevalent across Houston’s cityscape and proposes a new post-industrial landscape that aims to bring permeability to the site.

Past storms like Hurricane Harvey, have caused serious damage to the city due to this imperviousness. By looking closely at the existing site, it is apparent that most of the grounds consist of asphalt and concrete hardscapes. With the high risk of natural disasters hitting the city, it is inevitable that the site will be flooded again in the foreseeable future.

The existing buildings on site are minimally intervened into, with most of the design focusing on the ground surface between the existing structures. Five ground ‘operations’ of excavating, perforating, routing, skinning and stacking are implemented across the site to create new typologies of landscapes such as a Valley, Forest, River, Wetland, Grassland or Mountain.

These typologies either ‘eat’ into or ‘stack’ onto the existing buildings to enhance their operational and programmatic capabilities. Ground Matter is thus a post industrial landscape and a localized manifesto to tackle an urgent urban condition through the blurring of edges between built architecture and natural landscape that is operationally responsive and responsible but also programmatically varied and provocative to provide settings of occupation.
This is a catalogue of explorations in

Readaptation
This is a catalogue of explorations in...
This is a catalogue of explorations in

06.04 FIELD OPERATIONS

THE RIVER

THE WETLAND

THE FOREST

Readaptation
This is a catalogue of explorations in Readaptation
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This was a catalogue of work developed over six semesters at Columbia, GSAPP.

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