JOHN_BAKER

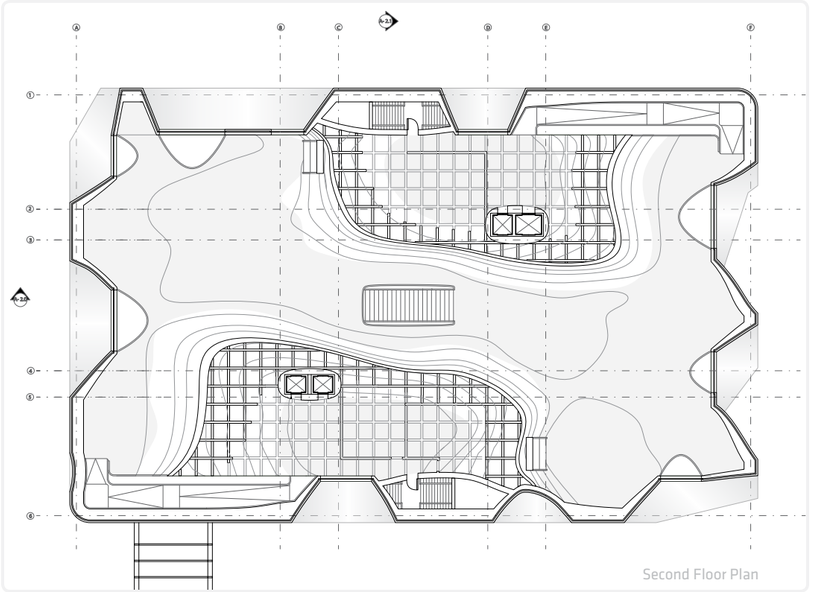
Architectural Portfolio

Table of Contents

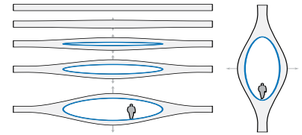
Serlachius Gosta Museum

[2011] Design Development Studio

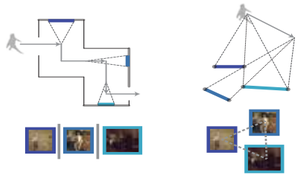
HydroCal cast in milled foam molds (2.5 x 2.5 x 2 ft.)



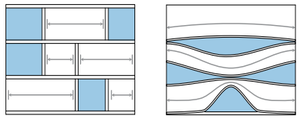
Second Floor Plan



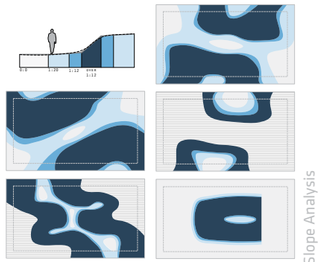
Bifurcation



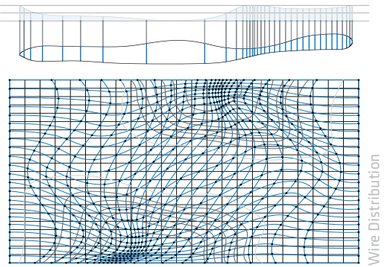
Art Display



Support Space

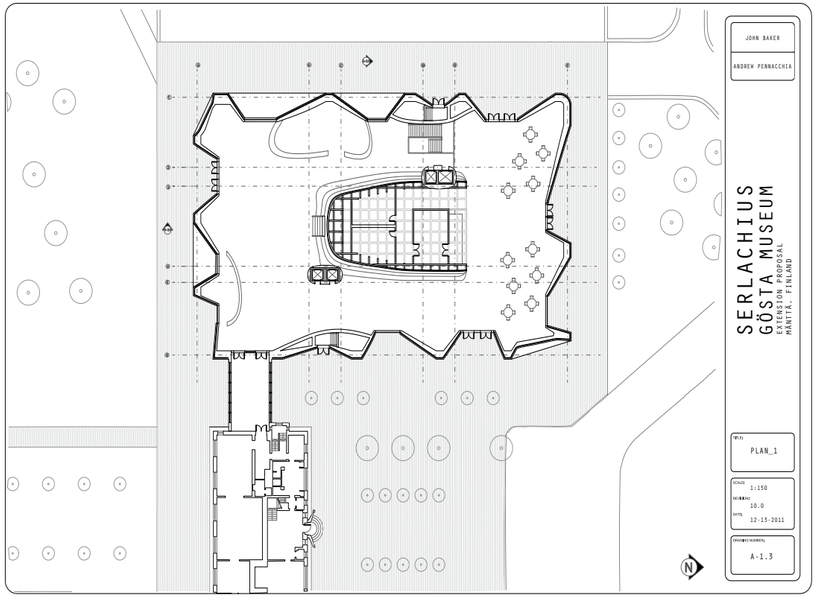


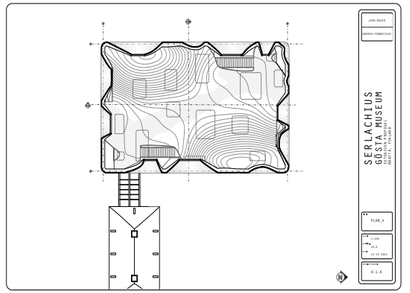
Slope Analysis

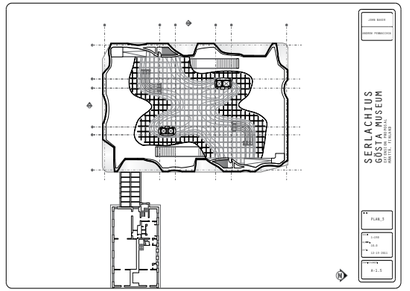


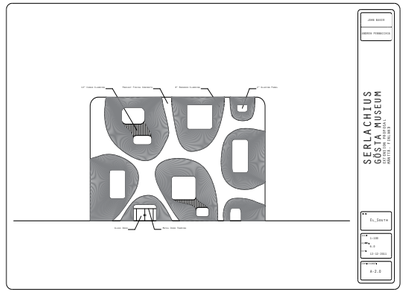
Wire Distribution

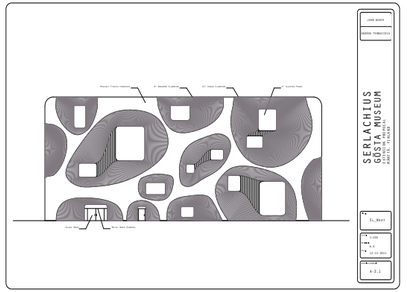
The project was brought from schematic design to the design development phase. The construction served as an expansion to the Serlachius Gosta Fine Arts Museum and reinterpreted the spatial configuration of many typical museums to allow the user to have a more engaged experience than typical fine art museums. Open floor plans created the opportunity to separate supporting programs from the main exhibition spaces. These interstitial spaces become hidden within the floor sections while art was displayed on a unique integrated wire infrastructure that was devoid of ancillary programs. Analysis programs were built and used to comply with floor slope code, wire display distribution, and environmental lighting conditions.
[Pella Prize Scholarship: Systems Integration ($1,000)]

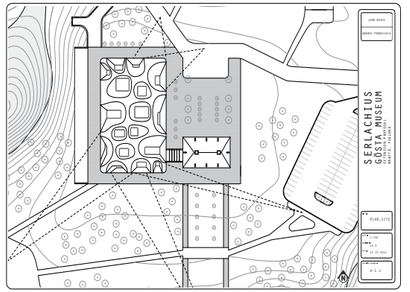

JOHN BAKER
ANDREW PENNACCHIA
SERLACHIUS
GÖSTA MUSEUM
PLAN_1
1:150
10.0
12-15-2011
A-1.3

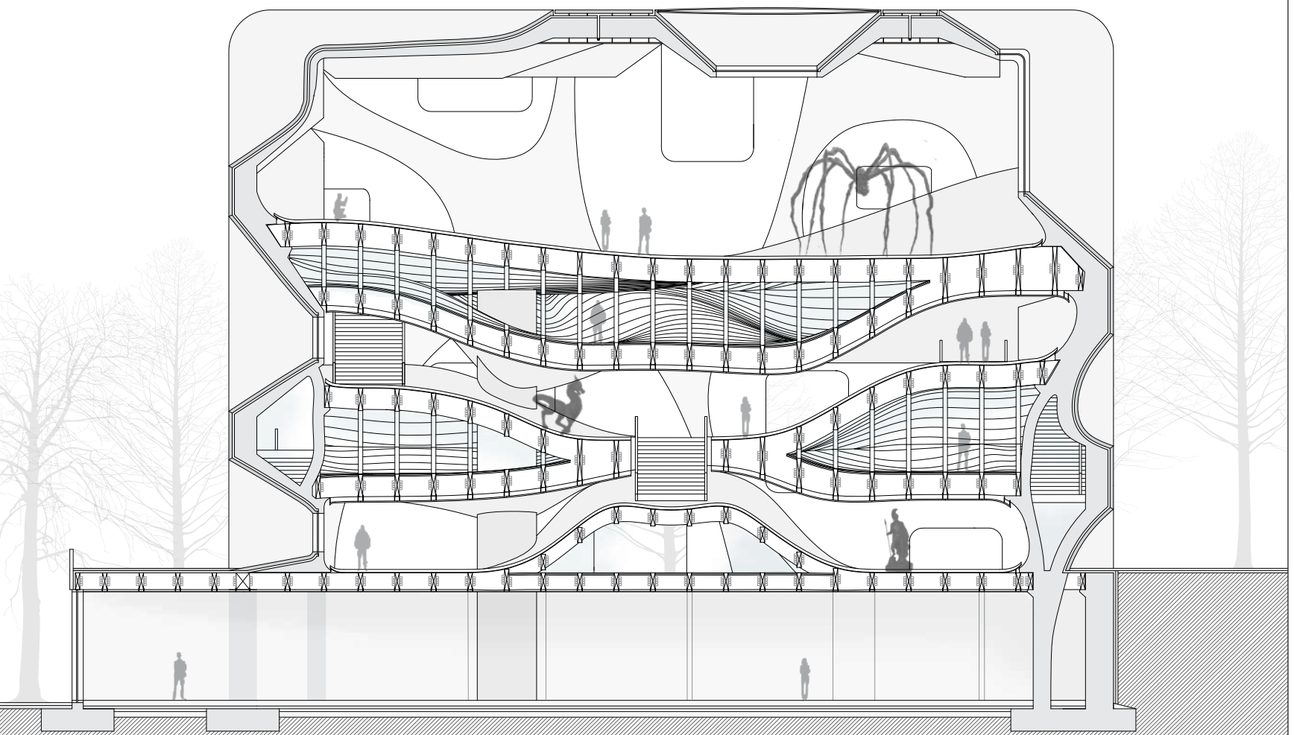

SERLACHIUS
GÖSTA MUSEUM


SERLACHIUS
GÖSTA MUSEUM


SERLACHIUS
GÖSTA MUSEUM

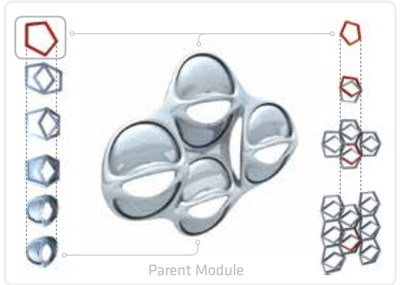

SERLACHIUS
GÖSTA MUSEUM


SERLACHIUS
GÖSTA MUSEUM



ReTender: Parametric Skin

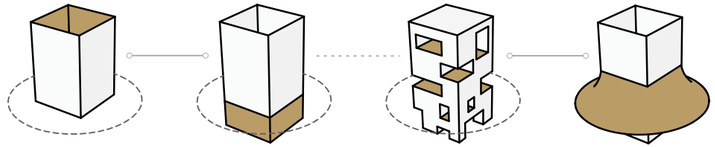
[2010] Politecnico di Torino Workshop



The workshop focused on biological systems for creating new parametric building skins. This led to the study of polar bears and how their hair and skin contain unique light bouncing and heat absorption properties. Our facade system leveraged these properties to capture and absorb direct and indirect light for interior heating and lighting mitigation. A parent-child system of modules was created to deal with the varying skin conditions and environmental fluctuations. Several modules utilized the ability of shape memory polymers to geometrically adapt with changing temperatures to regulate lighting changes. The positioning of each module was computed based on sun paths and existing interior programs. [Posted on Bruce Sterling's Wired.com blog: "Beyond The Beyond"]

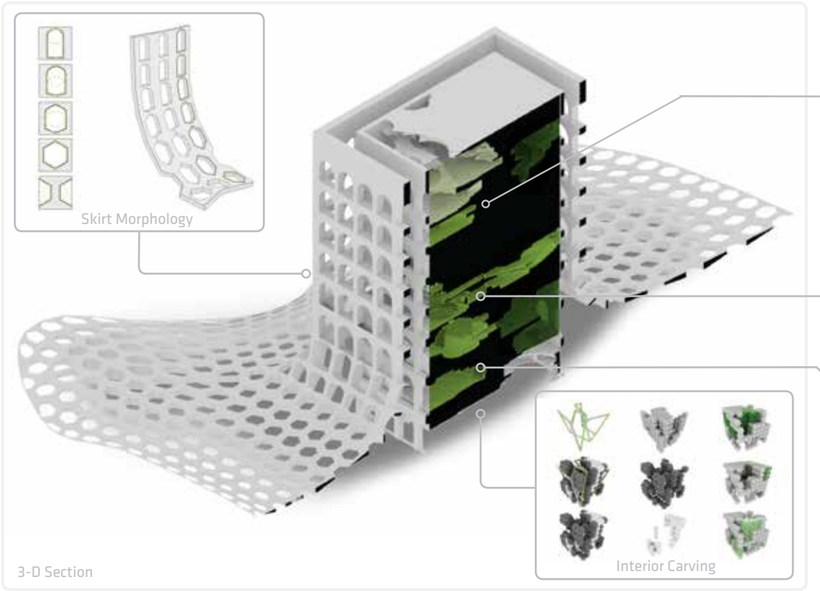
Interactive Monumentality

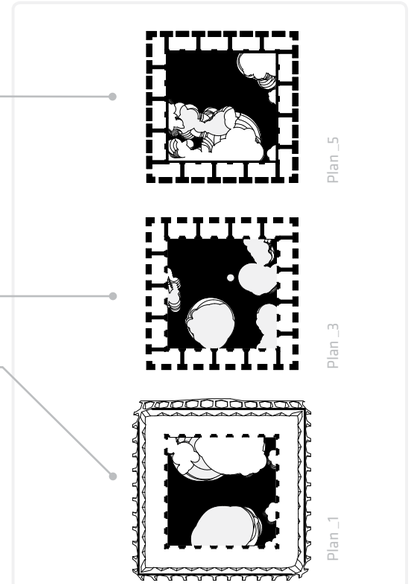
[2010] Rome EUR Redevelopment

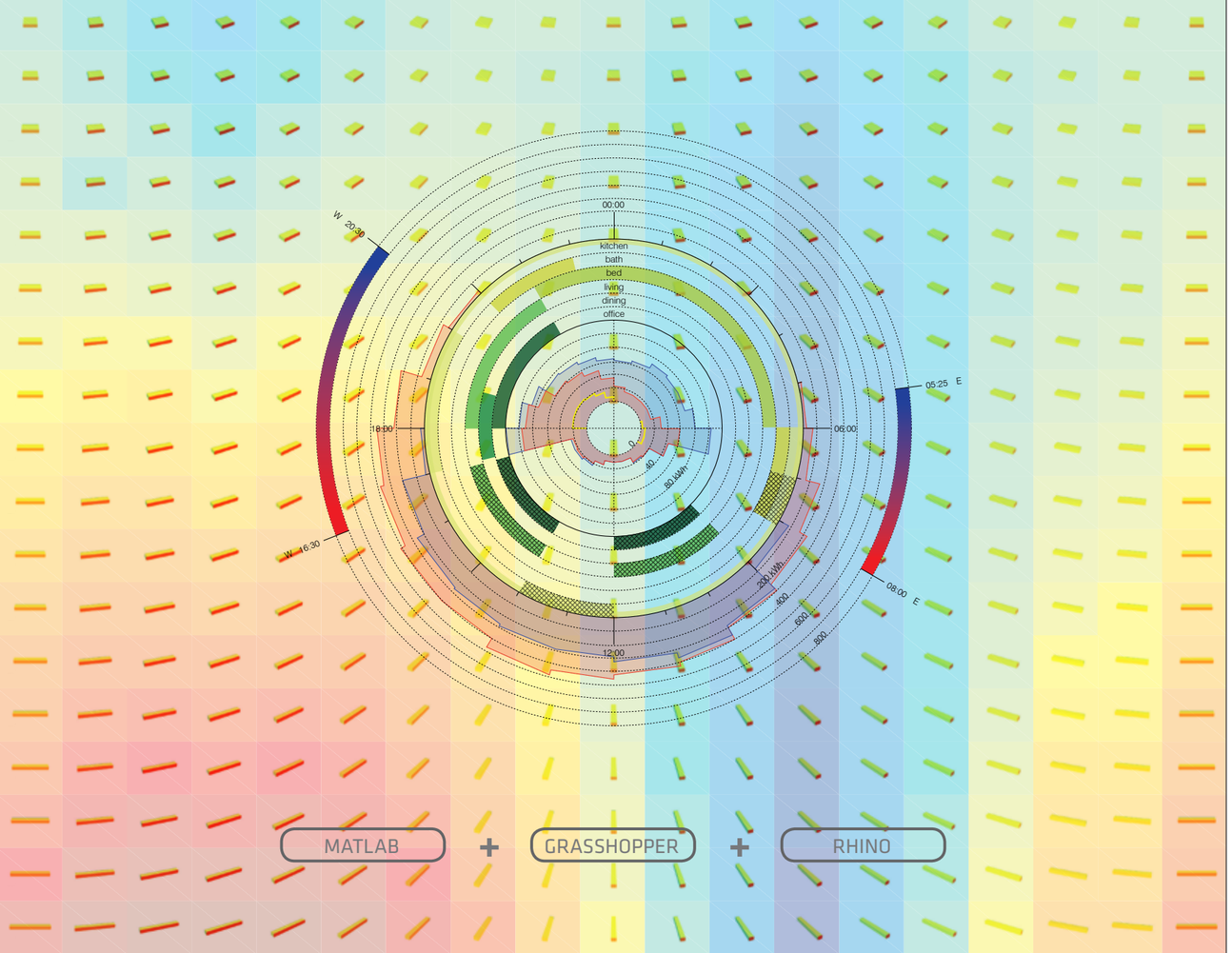


The project was established to rehabilitate the under utilized space of the EUR in Rome, IT. It worked to adapt the "Square Coliseum" which acts as a monumental center piece of the complex. The proposal operated to maintain the successful and impressive monumental aspect of the project while creating a more personal engagement while up-close and within the interior spaces. This was accomplished through maintaining the upper exterior shell while blending it into a overhead skirt that broke down the harsh preexisting entrance and local site conditions. The unused interior was gutted and replaced with an experiential public space that engaged one's senses. The space was created parametrically through a carving operation script that imitated conditions found in nature.


Redeveloped Section

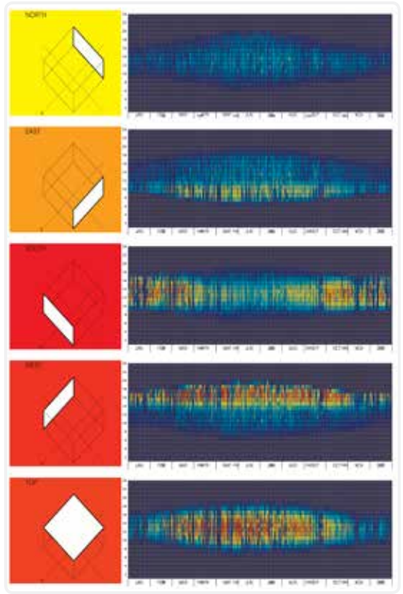

Skirt Morphology
3-D Section
Interior Carving

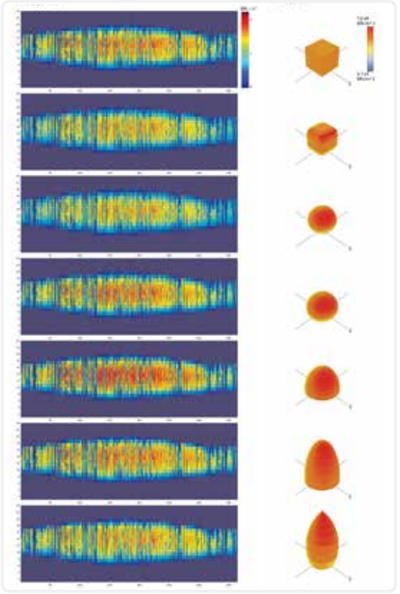

Plan_5
Plan_3
Plan_1

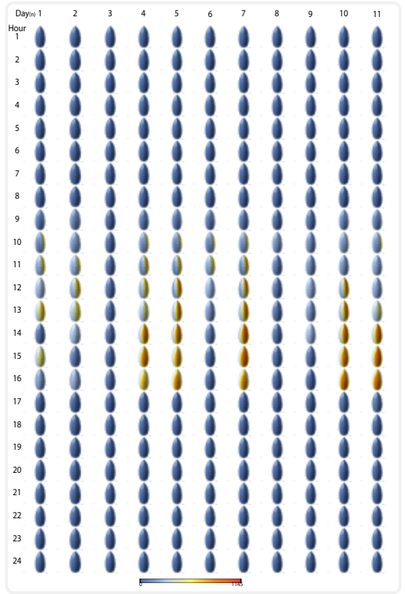


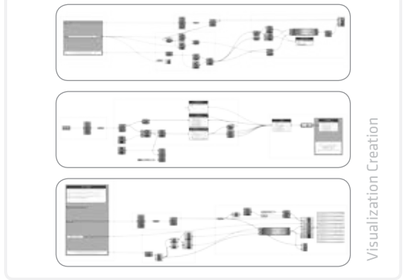
Solar Genetic Design

[2011 + 2012] CASE and Vertical Studio

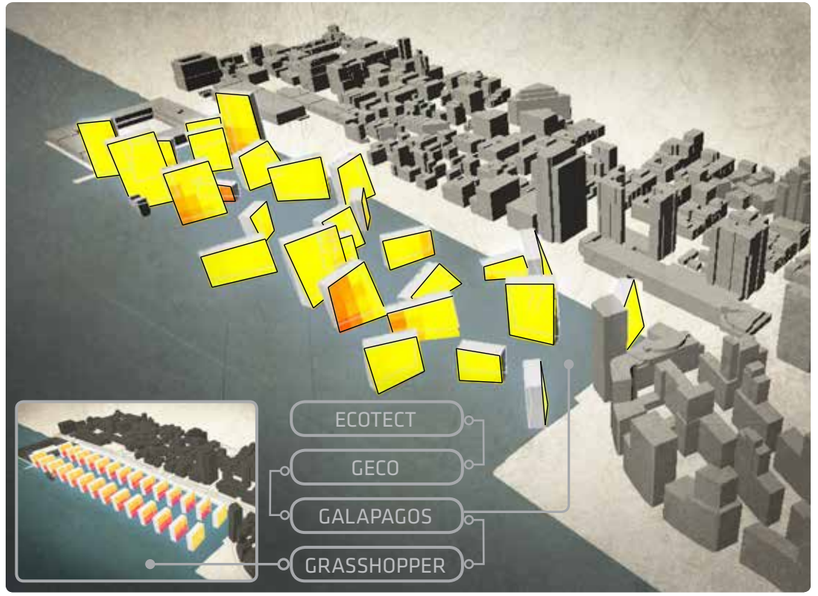


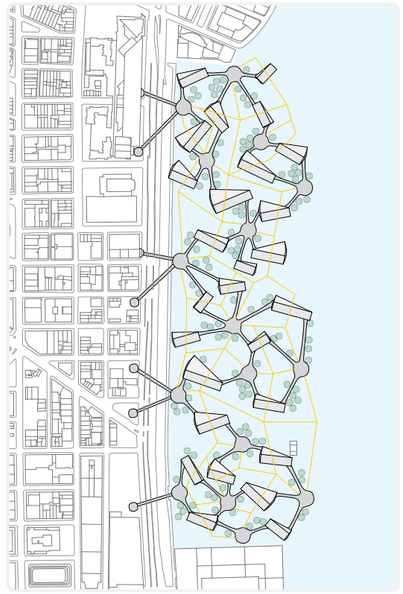






At the Center for Architecture Science and Ecology in NYC at SOM research is being done on many different sustainable architecture systems. While at the facility personal research was done to support graduate level students, which included photovoltaics, solar geometries, and analog sun tracking. Investigations led to creating an integration between in-house Matlab scripts and Grasshopper/Rhino. This enabled one to view solar patterns and affects of geometry in a very open format. The work allowed investigations on geometry to affect the patterns of incident solar radiation in relation to human occupancy patterns and energy generation. The experiences at CASE naturally progressed into a vertical studio project while back at RPI. The project adapted building morphology for urban farming within residential spaces. The geometries of buildings were determined through the usage of Geco, Ecotect, Grasshopper, and Galapagos. These programs enabled the application of genetic algorithms to create dynamic and diverse spatial conditions that were highly performative for solar orientation and growth within residential towers. This contrasted many projects that used rigorous and monotonous geometrical calculations for solar optimization. Interconnection between towers was further calculated to enable optimized multiple node transportation networks. A system of floating dynamic pods along the transportation network created spaces for new and mobile businesses tied into the local urban farming community. [Research for CASE in NYC at SOM]


ECOTECT
GECO
GALAPAGOS
GRASSHOPPER



Cloud-Power: Spatial Infrastructures

[2012 + 2013] Undergraduate B.Arch Thesis

Thesis Statement:

The current electrical power system is pervasive throughout our culture and is coupled with many other modern infrastructural network systems. The power system has been in place for many years and has become an essential part of modern society. This is most prevalent during times of disaster when the (top-down) system is fractured, causing an internal and external rolling infrastructural breakdown. The breakdown produces hard barriers between zones of power and no-power and leaves mitigation within the hands of large corporations.

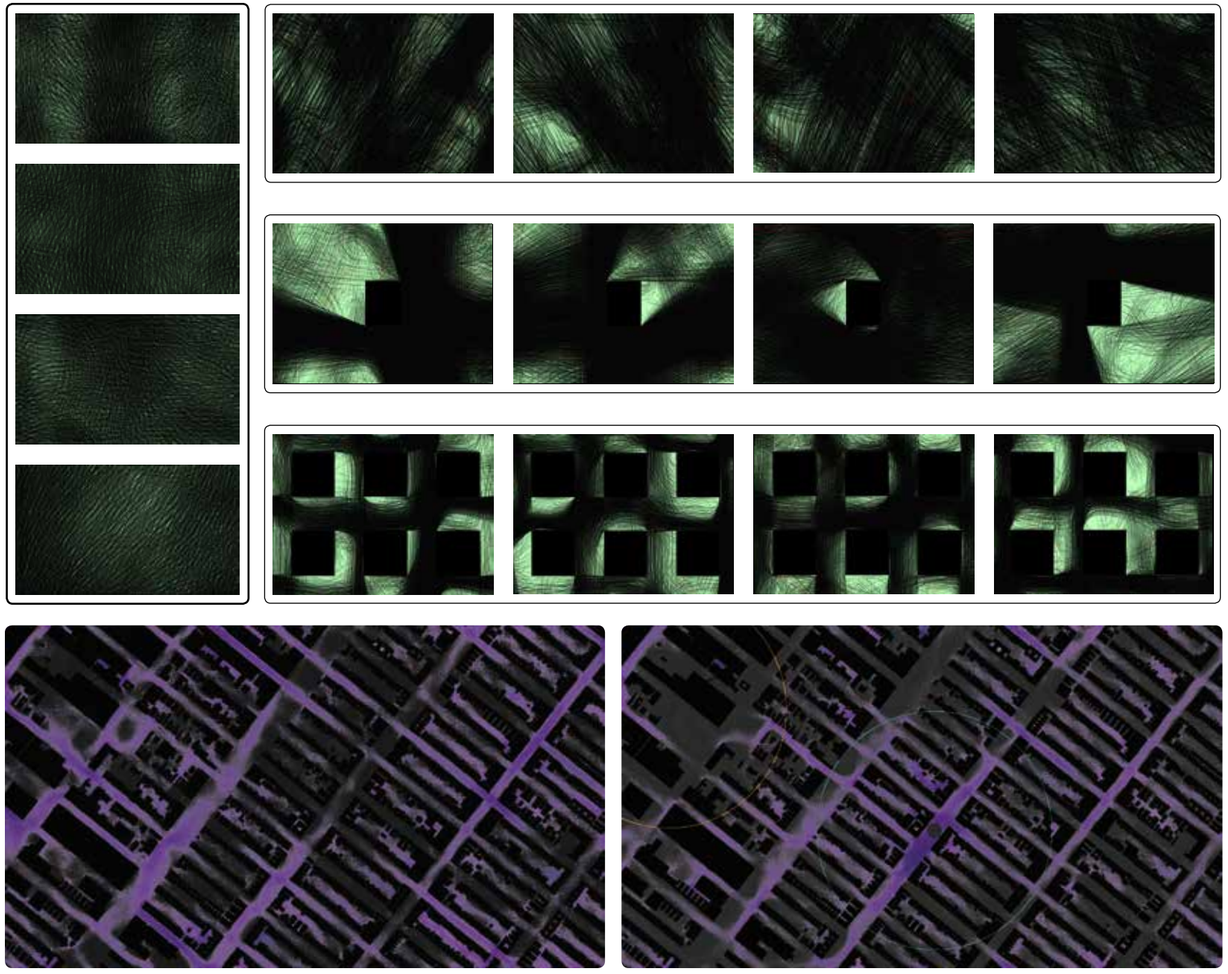
Current systems of power exchange exist as closed linear connections between objects or buildings within a space with little influence upon the surrounding urban constructs, beyond urban planning. The static point-to-point, hierarchical branching, system exists pervasively and homogeneously throughout all urban typologies with little ability for adaptation and a vulnerability for collapse from singular instances of disconnection.

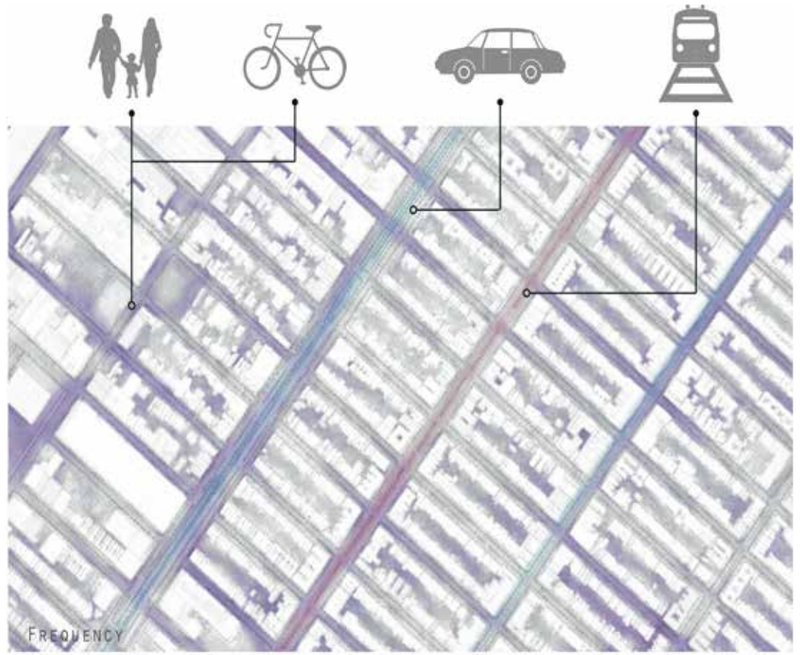
Through the emerging technology of magnetic resonant coupling technology developed at Witricity Corp. there is the potential to create a radial spatial, non-linear, infrastructure of exchange. The technology has been demonstrated within the context of a single enclosed space, but how will it manifest itself within our open urban context? The deployment of a spatial wireless infrastructure will be needed along with plans for future urban development.

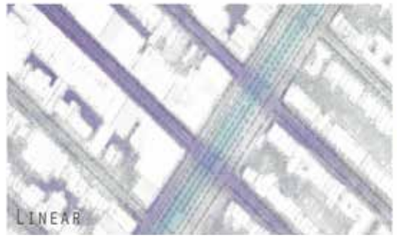
A spatial infrastructure would mean that the surrounding urban space, along with spatial objects, would be curators to an always adapting exchange system of multiple connections. Curation would be focused on the ability of urban frameworks and conditions to affect the frequency and density of social occupation to drive the confluence and exchange of energy and people. Protocols of transactions with value storage will be essential to drive the overall system, where exchange would reward the more fortunate and help the less for the health of the overall local population; resource equalization.

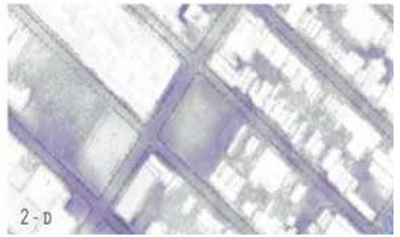
The system will establish itself as a new construct of our urban environment that will move beyond the original disaster influence. The system will form to adapt our habits and patterns of urban occupation, and enable the bottom-up development of new individual and cooperative organizations.

[Peck Prize: Best Architecture Thesis (Finalist)]

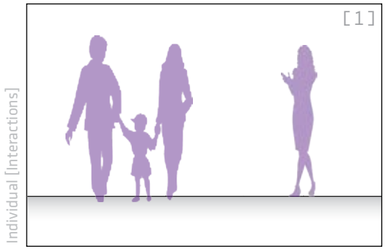


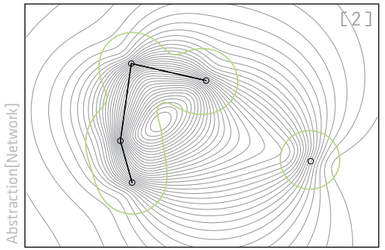

FREQUENCY

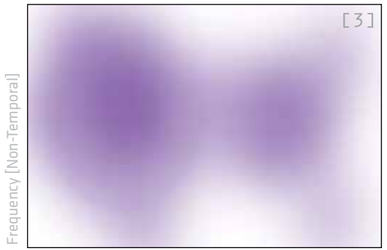

LINEAR


2-D

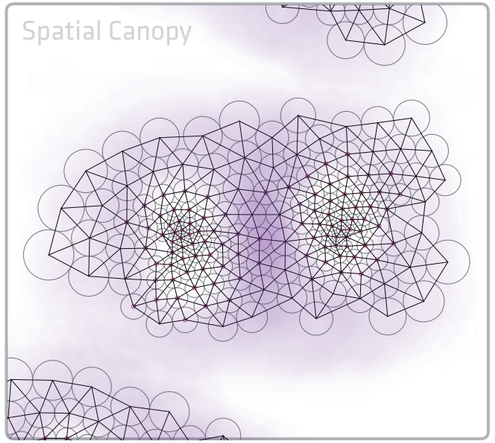

vs.

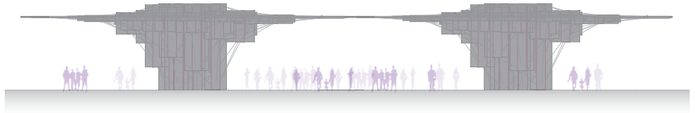

[1]
Individual [interactions]

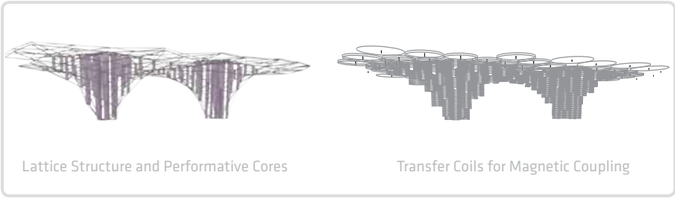

[2]
Abstraction [Network]


[3]
Frequency [Non-Temporal]

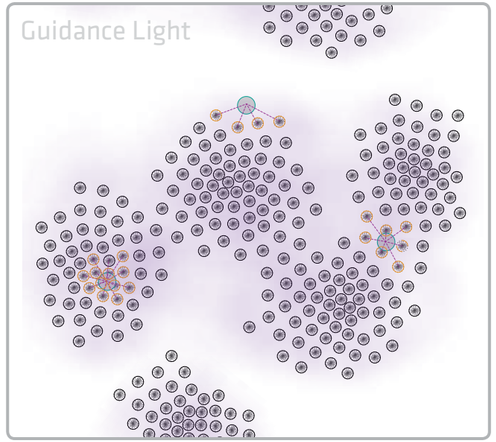
Spatial Canopy

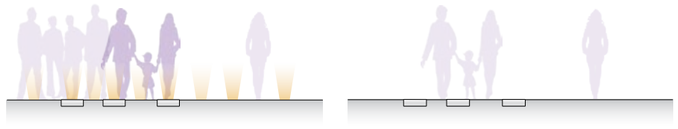


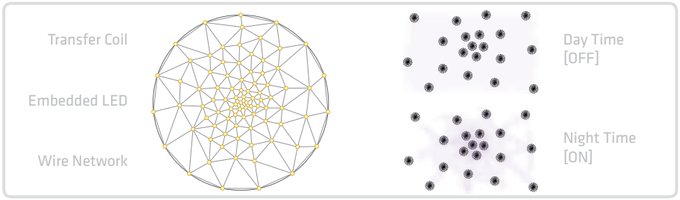


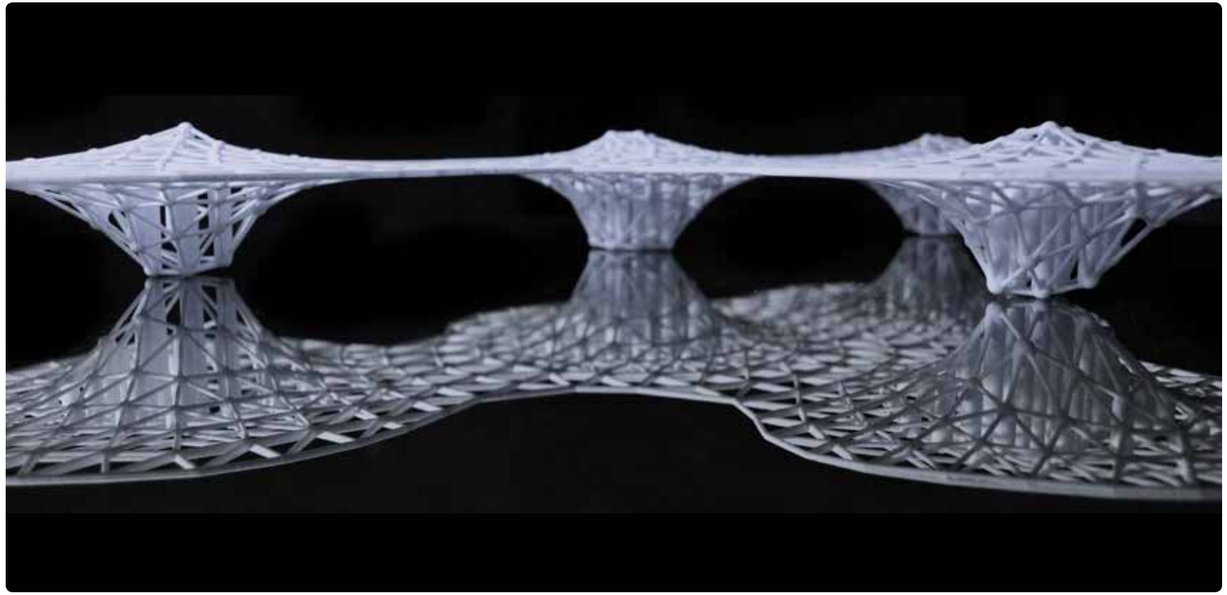


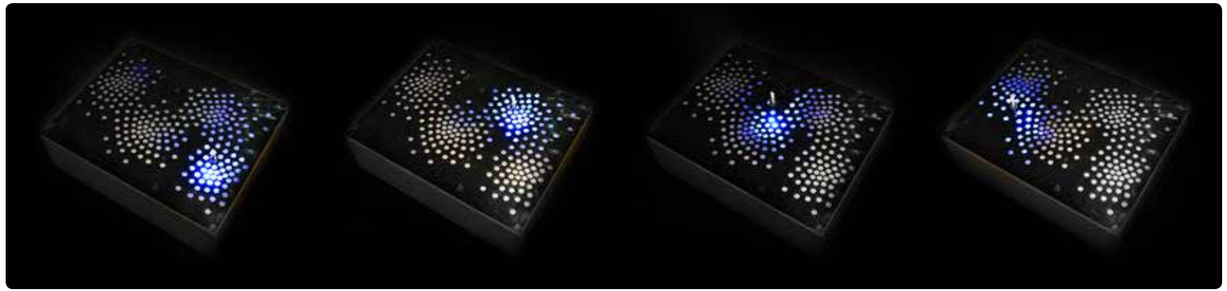
Guidance Light

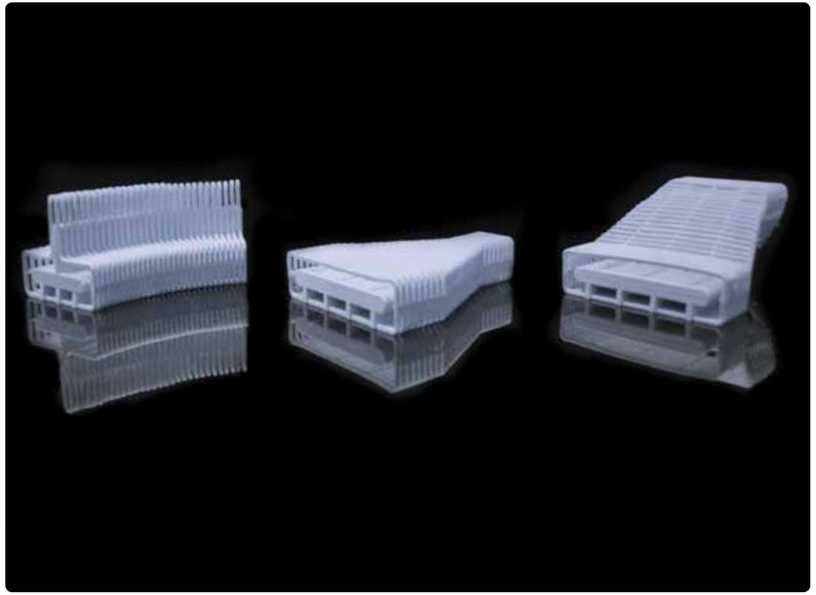


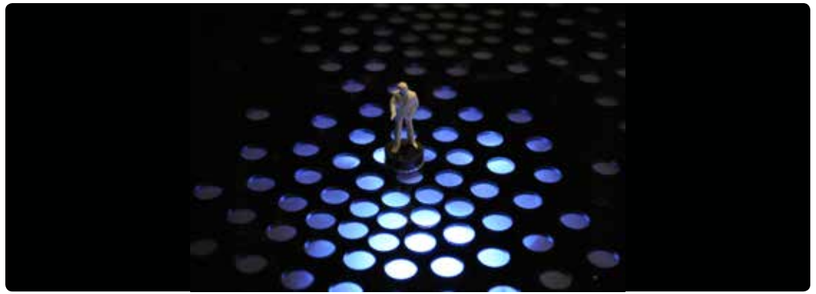


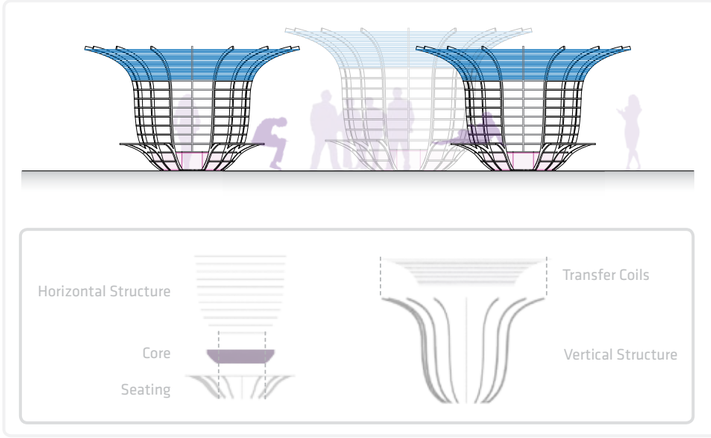


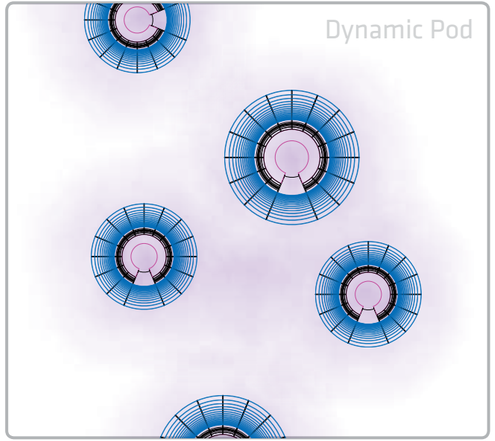


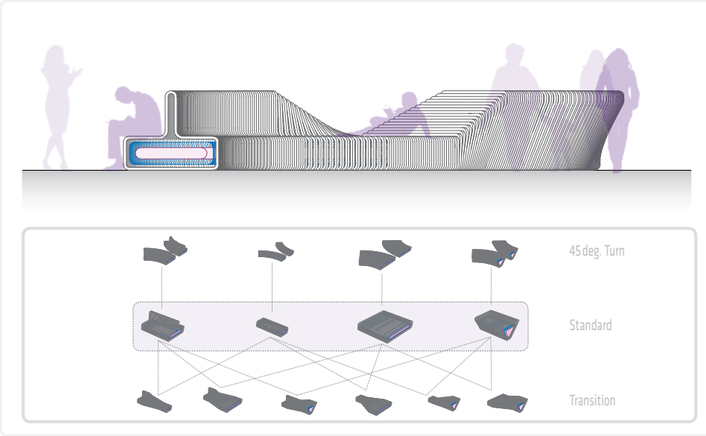


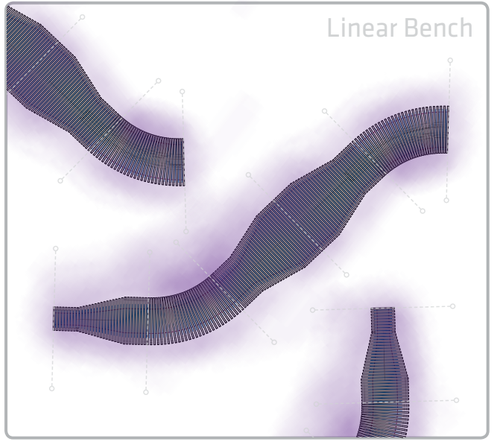




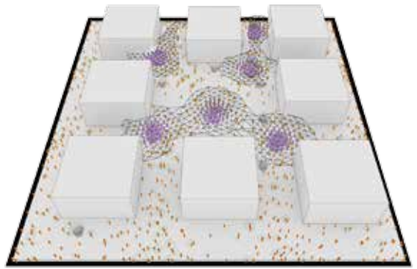

Horizontal Structure
Core
Seating
Transfer Coils
Vertical Structure


Dynamic Pod

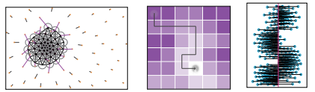

45 deg. Turn
Standard
Transition


Linear Bench

PROCESSING + GRASSHOPPER + RHINO + GALAPAGOS



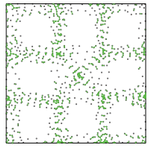
Canopy Deployed



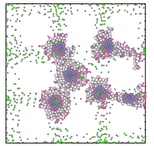
Probability [Canopy]

Movement [Pod]

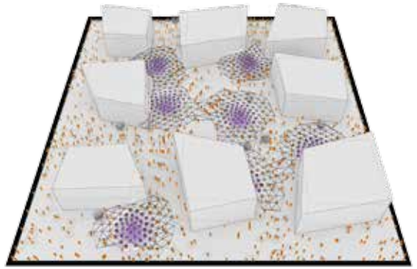
Deploy [Light]



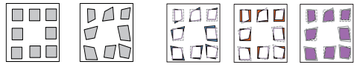
Without Curation



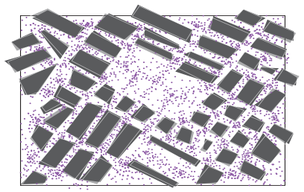
With Curation



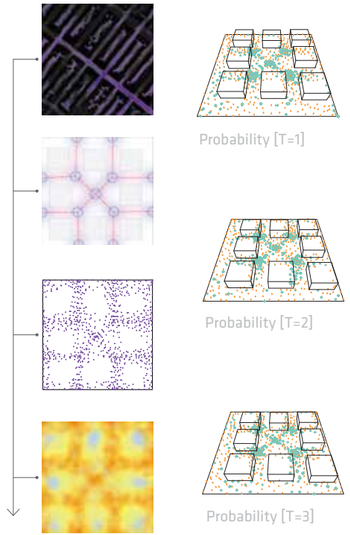
New Formation



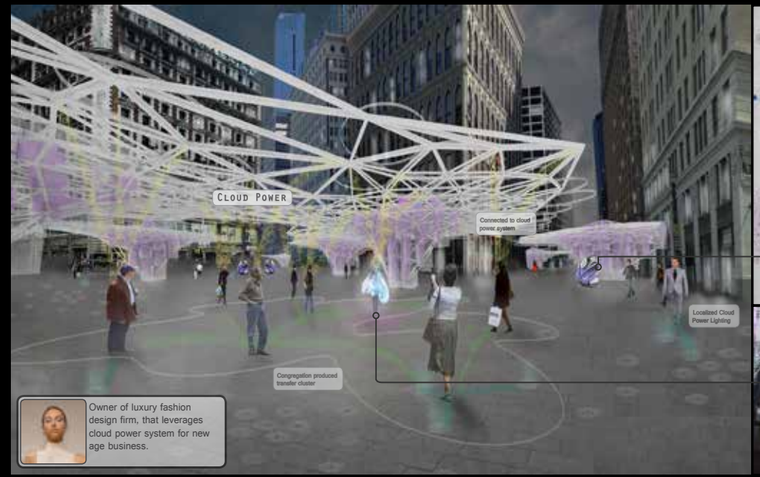
Planning Adaption

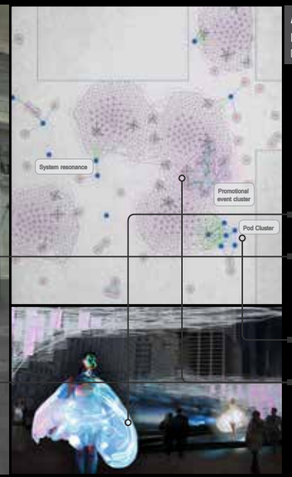


Washington Square Park: Case Test



The creation of probability environments was created through the random distribution of points along rules that were observed in testing with Processing scripts of real city environments. These test environments were leveraged to create high fitness (number of possible connections under dynamic conditions) canopy deployments. This operation was furthered in a feedback loop to allow for the geometry of the built environment to be adapted to create more optimal probability environments for the deployment of canopies. The establishment of components in these environments would be the first phase of initiation with the urban planning and zoning established for the adaption towards a more optimal built environment of the overall cloud-power system.





Owner of luxury fashion design firm, that leverages cloud power system for new age business.

Adelay

Rich Fashion Guru

[Designer, Entrepreneur]

[07:15] Wakes up in the morning and prepares for work; lives in luxury apartments off Central Park

[08:20] Leaves for work, main office, using private self-driving individual pod vehicle

[08:40] Arrives at work, to oversee normal business operations

[10:45] Oversees development of new fashion garment that adapts to user's skin temperature to detect mood.

[12:10] Walks to local restaurant for lunch, and expresses fashion on way. Clothing becomes expressive while within range of power field

[13:15] Realizes she must travel to local retail store to help operations. Uses public pod system and pays while moving through automatic energy backed currency exchange

[18:00] Travels back to main office to prepare for that evening's promotional event

[19:15] Makes way to event using company pod, which pays through relaying to employee's pods; travel in cluster

[20:00] Event occurs in public space to demonstrate style and operations of clothing which feeds off cloud-power system

[22:30] Travels back to office as company cluster

[23:05] Travels back home individually in private pod, pleased to notice runner using new luxury athletic clothing line

Just recently had major surgery to have a fully artificial heart replacement. Maintains good health and enjoys staying active within the city.

Margret

Artificial Heart Patient

[Dependent, Zoning]

[8:00] Wakes up and makes sure her back-up and monitor systems are charged and operating well.

[9:30] Prepares to go Grocery Store which is a few blocks from her apartment complex.

[11:00] On way she must follow zones of urban furniture and high-frequency as safe travel zones to maintain power to her artificial heart. (map shows zones) Has "handicap" clearance to recieve free exchange from urban furniture and subsidized from others.

[11:45] Inside Grocery store has support systems in place for people with supportive devices.

[13:15] On way back asks for assistance to travel with others in order to take shortcut through non-guaranteed zone. Several people are quick to volunteer understanding the subsidies for transferring to "handicapped" personnel.

[13:45] Arrives home and thanks others for their support.

[14:45] Walks to local park, through safe zone, and hangs out on urban bench which provides safe-zone of occupation.

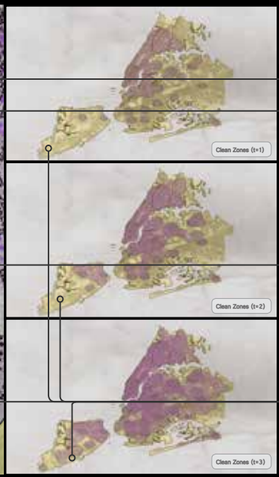
[16:30] Travels back home.

[18:15] Prepares dinner from today's groceries.

[21:15] Enjoys watching surplus releases throughout city from her balcony.

[22:30] Retires for bed.

Has recently joined a commune of anti-CloudPower believers. Believes that the system is detrimental to our society and health.



Jasmine

Avoider

[Anti-System]

[4:15] Wakes up at "protected" communal housing on edges of city. (built of metal facade for protection)

[7:15] Bikes to work at local urban farm. She must travel along known zones lacking urban furniture and of low-frequency. She also carries a homemade detection device, and wears metal fiber enhanced clothing for magnetic field protection.

[8:15] Arrives at work.

[8:30] Must go to meeting , because her group is suing and developing a court case against several people who have been using system near their "non-magnetic harvested" plants.

[11:30] Eats lunch from days harvest.

[14:15] Travels back to the commune early to avoid rush-hours of device system using individuals.

[15:00] Arrives at commune and changes out of protective clothing.

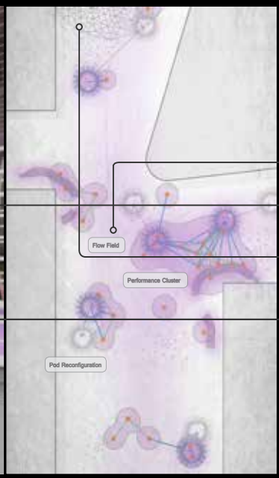
[18:00] Eats dinner that is prepared by commune members on a rotating basis.

[20:00] Host gathering at commune to teach people and preach about the detrimental affects of the system.

[22:00] Helps to update locations of clean zones, which have steadily been shrinking.

[23:00] Retires to bed.

High school drop-out and eventually resorted to street-performing to maintain a living. Enjoys his job greatly, but not living conditions.



George

Street Performer

[Grouping, Cooperation]

[4:45] Wakes up at illegal communal living area. Was established from homeless as means of power congregation to allow for cooperative powering.

[7:15] Congregates with group to make hot-water for breakfast. (requires higher voltage than individuals are naturally capable of creating)

[8:00] Walks to preferred performance spot. (Away from urban furniture and fixed mechanisms, to leverage flow field)

[9:00] Begins to attract tourist crowd and "performs" (Performance devices feed off opened local fields and are more expressive as the field increases around them. Also, take percentage out as "tips".)

[11:30] Travels to closest urban canopy to exchange energy tips for credits that he uses to buy a cheap lunch.

[12:15] Goes back to performance spot.

[14:30] Begins to attract larger and larger crowd from afternoon tourists. As crowd grows his performance possibilities expand.

[21:30] On way home, stops by another canopy to cash in part of energy tips to buy dinner and reward himself for a successful day. He also saves a very small fraction of the credits, because of his long term goal of progressing out of homelessness.

[22:45] Back at communal space people congregate to power systems, such as a radio and a heat pad.

[23:45] Retires to sleep in grouping of communal members.

JOHN_BAKER

baker.r.john@gmail.com
1_703_615_7666

john-r-baker.com

Thank You for taking the time to view my work and please feel free to contact me!