Disheveled Geometries II
Towards a New Rustication in Architecture

Mark Foster Gage
Disheveled Geometries
Towards a New Rustication in Architecture
Yale School of Architecture

Instructor:
Mark Foster Gage

Teaching Assistant:
Todd Christensen

Student Participants:
Christos Bolos
Miroslava Brooks
Amy DeDonato
Danielle Duryea
Will Fox
Sarah Gill
Peter Logan
Amir Mikhaeil
Diana Nee
Justin Nguyen
Dawood Rouben
Melissa Shin
Disheveled Geometries: Towards a New Rustication in Architecture

From the Latin rustication, and originally defining an unsophisticated rural mentality, the term rustication is used to describe architecture’s most extreme category of surface textures. If, historically, architectural rustication was seen as a less refined manner of shaping material that subsequently retained a rough texture, then the twenty-first-century condition would be the exact reverse. Rustication now takes more effort rather than less, and skill is measured in moving away from architectural smoothness instead of toward it. With the ability to parametrically, algorithmically, and fractally manage matter at increasingly small scales of resolution, this seminar revisits the topic of rustication, where architects design unapologetically contemporary textures that might act in the service of everything from wind dispersal, shading, insulation, water shedding, grip, power generation, physical defense, or pure aesthetic effect. Students study methods of rustication from throughout history and use this research as a foundation to design and produce large-scale prototypes. Whereas in 2010 this seminar dealt with strategies involving carving textures from large homogenous masses, for the spring of 2012 we will be working with strategies of complex folding, contouring, aggregation, interlocking, and, in particular, effects involving new readings between texture and color. Students are expected to produce original work that operates at the forefront of the profession, and, accordingly, will be doing research to locate their own work relative to that of a select group of contemporary experimental practitioners. Enrollment limited to ten.

| January 12 | first class | Introduction |
| January 19 | review | 10+1 Contemporary Textures |
| {post-it session} | assignment given | Translation of Formal Ambitions |
| January 26 | review | Translation of Formal Ambitions |
| | assignment given | precedent analysis |
| Manferdini, Rah, Berkel, Piano, Gautrand | | Sejima, Levitt Bernstein, Ito, Masubuchi/ Falders, Soler, Mayne, Herzog, |
| February 02 | {no class} | {advanced studio travel week} |
| February 09 | review | Precedent Analysis |
| | assignment given | Rustication Prototype 1, groups formed |
| February 16 | review | Rustication Prototype 1, progress |
| February 23 | review | Rustication Prototype 1, progress |
| | invited experts, as required | |
| March 01 | progress meetings | Rustication Prototype 1- mid term review week- |
Mark Foster Gage | Yale School of Architecture | Disheveled Geometries

March 08  {no class}  {spring break}
March 15  {no class}  {spring break}
March 22  full review  Rustication Prototype 1, full physical prototype due
March 29  pinup  Rustication Prototype 2, ambitions and precedents
April 05  review  Rustication Prototype 2, progress check
April 12  {no class}  {open house}
April 19  group meetings  Rustication Prototype 2, progress check
April 26  {no class}  final review week
May 01  final review  Rustication Prototype 2, final prototype due

*Additional workshops run by the TA and others will be offered during the course of the semester in the evenings. Attendance is mandatory unless student can demonstrate competence in the area being covered.

** Students unable to master the required skills at the time they are needed will be required to do a series of additional tutorials and assignments at the discretion of the instructor.

Projects

Students will be expected to complete a series of assignments during the course of the semester that address the technical aspects of the subject material, as well as the various historic and conceptual topics presented in the discussions and lectures. In all design assignments students will be required to produce original and expert work, devoid of errors and omissions on the part of any material or mechanical processes. That is to say that given the resources made available to the students, as well as the professional research standard set in the seminar, no incomplete, damaged, or otherwise sub-standard final projects will be allowed to be presented during the final review. Determinations of such will be made at the discretion of the instructor. As such it is recommended that students test their techniques and materials far in advanced of the production of the final prototype in order to assure the efficacy of the process. Alternatively, students may outsource their fabrication to professionals outside of the school in the event that the schools resources are unable to reliably produce the intended result. Such outsourcing, per the rules of the school, must be clearly labeled in subsequent portfolio or award submission materials.

Project:  “10+1 Contemporary Textures”
Students will, using magazine, online sources, the collection of physical objects, and other methods of research compile ten contemporary textures that fit within the sensibilities outlined in the presentation of the assignment. Students will print one 8-1/2 x11 image per texture, vertically oriented, at 150 dpi, for a pinup/post-it session where we will distill the significant formal aspects of each.

Project:  “Translation of Formal Ambitions “  Students will three dimensionally model, collage, or find related precedents for prototype panels based on their established research.
ambitions from the previous week.

Project: “Precedent Analysis”
Students will, using a standardized set of representation tools, analyze the location and use of rustication and texture on specific iconic buildings from contemporary architecture. Special attention will be given to how the rustication contributes to the overall architectural ambition of the project. Students will then select, with the instructor and TA, a specific 10 x 18’ section of the rusticated elevation, and through 3d modeling, recreate the texture, panels and joints for a scalar comparison with other rustication types. This project will constitute a full formal analysis of a particular elevation in terms of massing and composition, but will add to this the detailed textural information of the rustication itself.

Project: “Rustication Prototype 1”
Students will design and produce a physical rusticated prototype panel that conforms to the ambitions set on the previous pinup. Projects must not deviate from the original ambitions set in this exercise as technical difficulties are meant to be overcome rather than avoided. Each student will produce a physical panel using the material and fabrication method of their choice, that measures 30” x 48” with varied depth. Each panel will be displayed in a containing frame that is standardized for all projects within the class. Students will also photograph their prototype in varying light and atmospheric conditions to illustrate the range of performative values and visual effects produced.

Project: “Rustication Prototype 2”
Students will, individually or, in groups of 2-3, develop a significantly larger and more ambitious prototype than the first prototype. The two projects may, but do not need be related in any way. The ambition for this physical prototype will be set earlier in the course, and likewise, the final product must not deviate from this original idea. Each student or group of students will produce a panel that measures 4’ x 6’, with variable depth. Each panel will be displayed in a containing frame that is standardized for all projects within the class. Students will also photograph their prototype in varying light and atmospheric conditions to illustrate the range of performative values and visual effects produced.
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Contemporary Textures
“Post - It” Session

Students will, using magazine, online sources, the collection of physical objects, and other methods of research compile ten contemporary textures that fit within the sensibilities outlined in the presentation of the assignment. Students will print one 8-1/2 x11 image per texture, vertically oriented, at 150 dpi, for a pinup/post-it session where we will distill the significant formal aspects of each.
DISHEVELED GEOMETRIES

1228b Disheveled Geometries / Melissa Shin

PRECEDENT RESEARCH

MANTIS ORCHID


**Precedent Analysis**

Architectural Panel Precedent Analysis

Students will, using a standardized set of representation tools, analyze the location and use of rustication and texture on specific iconic buildings from contemporary architecture. Special attention will be given to how the rustication contributes to the overall architectural ambition of the project. Students will then select, with the instructor and TA, a specific 10 x 18’ section of the rusticated elevation, and through 3d modeling, recreate the texture, panels and joints for a scalar comparison with other rustication types. This project will constitute a full formal analysis of a particular elevation in terms of massing and composition, but will add to this the detailed textural information of the rustication itself.
1. 0.8 mm polyurethane-coated sheet-steel capping
2. roof construction:
   - 3 mm plastic sealing layer
   - reinforced concrete ribbed roof slab in permanent steel formwork
3. 60 mm precast concrete facade panel
4. 50/50/6 mm galvanized steel angle
5. 100/200 mm steel I-beam with sprayed plaster fireproof coating
6. 100 mm thermal insulation
7. 9.5 mm silicate sheeting, painted
8. floor construction:
   - 2 mm PVC coating
   - 9 mm plywood sheeting
   - 80 mm thermal insulation
   - 12 mm underfloor heating layer
   - 12 mm plywood sheeting
9. 200/200 mm steel I-beam
10. 75/75/6 mm galvanized steel angle
11. 30/30/3 mm aluminium channel
12. 10 mm fixed glazing
13. 75/40/5 mm steel channel
14. 100/100/12 mm galvanized steel SHS
15. 3 mm coated sheet aluminium panel
16. 44/9 mm galvanized steel strip bent to shape
17. Ø 6 mm stainless-steel rod
18. aluminium fixing plate
19. 100/100 mm steel I-beam
20. 120/75/7 mm galvanized steel angle
21. floor construction:
   - 15 mm floor boarding on 45/95 mm beams
   - 3 mm sealing layer
   - reinforced concrete ribbed floor slab in permanent steel formwork

**Double-Layer Screen**

1 x 2 Meter Panels

Composite Metal and Plastic Billboard Facing

Stainless Steel Rod Backing System

Rigid Tape
1116 Apartmenthaus and Studios in Tokyo

**Detail 07**

- 1. 0.8 mm polyurethane-coated sheet-steel capping
- 2. Roof construction:
  - 3 mm plastic sealing layer
  - Reinforced concrete ribbed roof slab in permanent steel formwork
- 3. 60 mm precast concrete facade panel
- 4. 50/50/6 mm galvanized steel angle
- 5. 100/200 mm steel Å-beam with sprayed plaster fireproof coating
- 6. 100 mm thermal insulation
- 7. 9.5 mm silicate sheeting, painted
- 8. Floor construction:
  - 2 mm PVC coating
  - 9 mm plywood sheeting
  - 80 mm thermal insulation
  - 12 mm underfloor heating layer
  - 12 mm plywood sheeting
- 9. 200/200 mm steel Å-beam
- 10. 75/75/6 mm galvanized steel angle
- 11. 30/30/3 mm aluminium channel
- 12. 10 mm fixed glazing
- 13. 75/40/5 mm steel channel
- 14. 100/100/12 mm galvanized steel SHS
- 15. 3 mm coated sheet aluminium panel
- 16. 44/9 mm galvanized steel strip bent to shape
- 17. Ø 6 mm stainless-steel rod
- 18. Aluminium fixing plate
- 19. 100/100 mm steel Å-beam
- 20. 120/75/7 mm galvanized steel angle
- 21. Floor construction:
  - 15 mm floor boarding on 45/95 mm bearers
  - 3 mm sealing layer
  - Reinforced concrete ribbed floor slab in permanent steel formwork

**Detail 08**

**Plan 04**

Dokumentation 1117

[Diagram showing floor plans and details]
ATELIER MANFERDINI
Merletti Installation (SCI-Arc gallery) 2008

- Interpretation of traditional Italian lace-making techniques
- Suspended canopy
  - Strung on 26 cables
  - 301 plastic pieces of various sizes (4 different types, half die-cut and half laser cut)
- Completion 3 months
  - Including ideation, planning, and mock-ups

Mirka Brooks
Amy DeDonato

Disheveled Geometries | Yale School of Architecture | Mark Foster Gage
toyo ito
tod’s omotesando building - tokyo

Sarah Gill. Disheveled Geometries. 09.01.2012
Patterned and ventilated cladding system of specially formed trapezoidal aluminium scales, whose colour and appearance adjust according to the quality and direction of the light.
1. LACB08
   - easy disassembly
   - can be moved to new location
   - in house set-up

2. Backframe
   - fiberboard, QNM
   - custom/made-to-order
   - cut-to-size
   - size (W x H - 0' 0"
   - weight

3. Facade frames
   - fiberboard, QNM
   - custom/made-to-order
   - cut-to-size
   - size (W x H - 0' 0"
   - weight

4. Insulation and cladding layer
   - exterior cladding and panel by METL-SHIELD
   - color
   - panel thickness
   - available in standard colors
   - possible to specify exact colors (DIN/EN, specific)

5. Support systems for cladding
   - should accommodate different types of samples
   - sheath of ferrocement
   - front to develop

6. Tails
   - back-up panel
   - hanging panel methods / patterns
   - expanded metal panels:
   - expanded metal panel types
   - expanded metal panel orientation / direction

visual mock-up of facade
initial sketch 1
SANAA 041127
Sarah Gill

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New Construction - Mikimoto Ginza 2

Location - Chuo-ku, Tokyo, Japan

Design and Construction - August 2003 - November 2005

Structure - steel frame and reinforced concrete

Facade - steel and concrete panels
  - steel plates of 1.2 cm were prepared and fixed by a web of studs spaced approx. 300mm apart in order to maintain a uniform thickness of 20 cm and then concrete was poured between them.
  - Panels were welded together once in place by hand

Finish - 6 different stages of polishing and painting to ensure a smooth finish that the customer required
Ministry of Culture and Communication by Francis Soler

**Where**
Paris

**Construction**
March 2003 - December 2005

**Building Size**
30,000 m² or 322,917 ft²

**Facade Material**
1/8” Laser Cut Stainless Steel

**Facade Coverage**
5,000 m² or 53,819 ft²

**Facade Inspiration**
Giulio Romano’s Palazzo del Te in Mantua. Photos of frescos within this Italian Renaissance building were distorted on computer into arabesques.

**Panel Size**
310 cm tall by 388 cm side (including gaps, center to center of adjacent panels.) There is an 8 cm gap between panels.

**# of Panel Patterns**
6 Patterns and their horizontal reflections

**Solid to Void**
40% solid, 60% void

---

**Connection A**
These panels are held off the building facade approximately 0.75m. This configuration was designed to create more space for those occupying the balconies.

The panels are tied back to the building near the four corners of each panel. A tension cable hangs the cantilevered connector. The connector is secured to the steel frame surrounding the laser cut stainless steel.

**Connection B**
These panels hug the building, standing approximately 0.15m in front of the glazing system. In plan the connectors secure two panels simultaneously. In section the connectors are about 0.2m inbound from the panels' edges. The connector is secured to the steel frame surrounding the laser cut stainless steel.
Typical Panel

A 5cm steel frame surrounds the stainless steel laser cut panels. Welded steel tabs hold the s.s. panel off the frame. The frame also bifurcates the panel vertically and horizontally for structural support. One horizontal line cuts through every panel while the number of vertical supports varies from two to four depending on the module. The horizontal support is in the same location for every module, about 0.75m from the bottom. Below this line, there is no laser cut pattern.
BEN VAN BERKEL  GALLERIA CENTERCITY
ORIGAMI BUILDING
MANUELLE GAUTRAND ARCHITECTS
PARIS
2011
SCREEN PRINTED MARBLE PATTERN FILM
SANDWICHED BETWEEN TWO LAYERS OF GLASS

~3000 MM THICK STEEL FRAMES

STAINLESS STEEL FITTINGS

ALUMINUM CURTAIN WALL SYSTEM
ROLAND SNOOKS
$unnatural selection

Justin Nguyen

Disheveled Geometries | Yale School of Architecture | Mark Foster Gage
SKYLAR TIBBITS
Tesselion
+ electro-active polymer (EAP) is ultra-light & flexible
+ no need for mechanical actuators
+ soft & responsive architecture

**SHAPESHIFT**

**EXPERIMENT AT ETH WITH EAP**

**Dawood Rouben**

**ART BASEL, MIAMI BEACH (LABRYS FRISAE): 3D GRAFFITI**

Holes: 202, 290; Rivets: 101, 145; Text: 12,584; Total Parts: 10,322; Weight: 1642lbs / 744kg; 256

Sheets of Aluminum: 74 Nodes, 13+ helped w/ assembly, over a week.

- Quadrant EPP USA, Inc. (www.quadrantepp.com) > provided us sheets of polyethylene (3/16" thick)
- Continental Signs (www.continentalsigns.net) & Jared Laucks > CNC cut of the panels
- Dick Dunlop > laser cut of the 320 unique connections (3/16" acrylic)

49 722 holes.
25 000 rivets.
10 420 text.
5 257 unique parts.
120 hours of CNC.
60 sheets of walnut veneer.
10 days of assembly.

- 2m Diameter Structure.
- 70 modules (2*2 types, 4 faces each).
- 12 sheets of golden aluminum.
- 3700 rivets.
- All /f_lat-packed.

- Weight = 75 lbs.
- 3 nights assembly.

**SUUKKAH**

**LOCAL LOGIC 2015**

**MARC FORNES**
APERIODIC VERTABRAE

- Quadrant EPP USA, Inc. (www.quadrantepp.com) > provided us sheets of polyethylene (3/16” thick)
- Continental Signs (www.continentalsigns.net) & Jared Laucks > CNC cut of the panels
- Dick Dunlop > laser cut of the 320 unique connections (3/16” acrylic)

ANOBULMS

- 2m Diameter Structure
- 70 modules (2 x 2 types, 4 faces each)
- 12 sheets of golden aluminum
- 3700 rivets
- All flat-packed
- Weight = 75 lbs
- 3 nights assembly

+ electro-active polymer (EAP) is ultra-light & flexible
+ no need for mechanical actuators
+ soft & responsive architecture
Disheveled Geometries

Melissa Shin

Melissa Shin

Disheveled Geometries | Yale School of Architecture | Mark Foster Gage

“With Migrating Formations, the designers have used 3-D printing techniques to explore the variation a scripted computer program can generate within the relatively regular form of a standard vertical wall. The project explores the potential of digital design’s ability to produce building elements en masse, particularly for the housing, incorporating ample opportunity for customization without significantly affecting cost. A series of wall cavities vary in size, depth, and articulation and subsequently differ in their ability to transmit light and express the system’s own non-repetitive, morphing pattern.”

- MoMA Home Delivery Exhibition catalog
194 BRICKS*

108 FULL BRICKS

36 HALF BRICKS

*CHANGE IN X AND Y SPACING
Design Exercise #1
Translation of Formal Ambitions

students will three dimensionally model, collage, or find related precedents for prototype panels based on their established research ambitions from the previous week.
Christos Bolos and Danielle
Amy DeDonato
Will Fox and Sarah Gill
Diana Nee
Panel System Prototype #1
Process, Production, Mid review Panel

Students will design and produce a physical rusticated prototype panel that conforms to the ambitions set on the previous pinup. Projects must not deviate from the original ambitions set in this exercise as technical difficulties are meant to be overcome rather than avoided. Each student will produce a physical panel using the material and fabrication method of their choice, that measures 30” x 48” with varied depth. Each panel will be displayed in a containing frame that is standardized for all projects within the class. Students will also photograph their prototype in varying light and atmospheric conditions to illustrate the range of performative values and visual effects produced.
Mid Review
Production and Fabrication
Christos Bolos and Danielle Duryea
Production and Fabrication
Miroslava Brooks
Production and Fabrication
Will Fox and Sarah Gill
Production and Fabrication
Peter Logan
Production and Fabrication
Diana Nee
Production and Fabrication
Justin Nguyen
Production and Fabrication
Dawood Rouben
Production and Fabrication
Melissa Shin
Production and Fabrication
Amir Mikhaeil
Christos Bolos + Danille Duryea
Fabrication Prototype #1
Mid review

Materials:
Fiberglass
Paint
Wood

Mirka Brooks
Fabrication Prototype #1
Mid review

Materials:
Plastic
Amy DeDonato  
Fabrication Prototype #1  
Mid review

Materials:  
Gator Board  
Museum Board  
Nylon  
Pins

Will Fox + Sarah Gill  
Fabrication Prototype #1  
Mid review

Materials:  
Steel
Peter Logan  
Fabrication Prototype #1  
Mid review

Materials:  
Dowel Rods  
Dye  
Foam  
Plastic Tubes  
Plexiglass  
Resin

Amir Mikhaeil  
Fabrication Prototype #1  
Mid review

Materials:  
Wood
Diana Nee
Fabrication Prototype #1
Mid review

Materials:
Spray Paint
Plastic

Will Fox + Sarah Gill
Fabrication Prototype #1
Mid review

Materials:
Foam
Paint
Plastic
Dawood Rouben
Fabrication Prototype #1
Mid review

Materials:
Aluminum

Melissa Shin
Fabrication Prototype #1
Mid review

Materials:
Copper
Mesh
Paper
Plastic
Plexiglass
Disheveled Geometries Final Review
Yale School of Architecture, Saturday - May 5th

Abby Coover
Cody Davis
Brian Deluna
Nate Hume
Michael Young
Christos Bolos and Danielle
Panel System Prototype #2
Process, Production

Students will, individually or, in groups of 2-3, develop a significantly larger and more ambitious prototype than the first prototype. The two projects may, but do not need be related in any way. The ambition for this physical prototype will be set earlier in the course, and likewise, the final product must not deviate from this original idea. Each student or group of students will produce a panel that measures 4’ x 6’, with variable depth. Each panel will be displayed in a containing frame that is standardized for all projects within the class. Students will also photograph their prototype in varying light and atmospheric conditions to illustrate the range of performative values and visual effects produced.
Our panels explore a new composite connective hardware. In addition, the assembly logic of materials, using the final panel adds further architectural laminate properties of fiberglass to act both structurally and as a connective system to a steel frame. The midterm panel begins the exploration into establishing a relationship between the two materials, while creating a gradient of solidity, translucency, and full transparency across the panel. Our final piece expands on what was learned from midterm, incorporating multiple layers and pours of fiberglass to create a fully fused system between layered composite and steel frame, eliminating the need for accessory
Final Model

Materials Used:
Metal
Fiberglass
Lighting System

Software Used:
Rhinoceros, Power mill

Fabrication Methods:
3 Axis Mill
Plasma Cutter
Therma Form
Arc Welder
Fiberglass
Miroslava Brooks
Disheveled Geometries

Yale School of Architecture | Mark Foster Gage
study models
investigating the assembly logic, optimal geometric structure of the modules, and material properties of the PTEG plastic

interlock and friction joints
the whole assembly is held together through interlocking of modules and attached to back panel with friction joints without any additional adhesive. the plexi rods serve as structure and diffused points of light.
Final Model

Materials Used:
Plexi Glass
Plexi Rods

Software Used:
Rhinoceros

Fabrication Methods:
Laser cutter
Drill
Project explores the tectonic potential of architectural fabrics within a facade system. With the 2001 showcase of BMW's G.I.N.A. prototype, the automobile industry began questioning the use of hard metal skins on traditional car bodies. Following a similar strand of research, the lycra skin of this facade installation produces a formal and tectonic relationship between structure and exterior surface that has the flexible capacity to infinitely change its geometric configuration.

All experiments are digitally modeled in Maya and fabricated using a structural rib system and lycra.

This project examines the material irregularities of lycra and specifically studies the control of seams, the loss and re-emergence of creases, and the relationship between soft and hard geometry.
**01. Structural Ribs**
Arrangement and height of vertical walls

**02. Bloom 'A'**
Structural rib profiles
Final Model

Materials Used:
Lycra
Chipboard
Museum board
Metal Fasteners

Software Used:
Rhinoceros, Power mill, Maya

Fabrication Methods:
3 Axis Mill
Laser Cutter
Our panel is a play between perceived depth and actual depth. Over the course of the semester we completed several exercises in which we overlaid patterns with a perceived depth on flat objects, and objects with no depth on surfaces that had depth. Our intent was to create an experience that had the capacity to overwhelm the viewer.

The panel was constructed in four quadrants completely out of faceted sheet metal. Each panel was welded together and in total there are well over two hundred welds to allow the panel to stand. The panel is best experienced at very close distances, or from within.

Will Fox and Sarah Gill
Disheveled Geometries | Yale School of Architecture | Mark Foster Gage
Final Model

Materials Used:
Metal

Software Used:
Rhinoceros, Mad cam

Fabrication Methods:
Plasma Cutter
Arc Welder
This panel is about an exploration of the playful and whimsical through the use of form, color and tectonic. I developed a logic of bundling and twisting through grasshopper scripting. My intent was to use the logic I developed to create a system of self generating linear elements that could be read topographically, as well as architecturally. The potential for this linear articulation to be deployed across a building facade is something that I both struggled with and embraced. The challenge was in creating an armature that would allow for my system to propagate, yet not compete with the formal ambitions of my project.

Peter Logan
Final Model

Materials Used:
Foam
Plastic tubes
Metal Wire
Resin
Dye
Plexiglass

Software Used:
Rhinoceros, Grasshopper, Power mill

Fabrication Methods:
3 Axis Mill
Laser Cutter
We were interested in exploring what is known as an Infinitely Periodic Minimal Surface. The IPMS is a fascinating phenomenon that is beautiful and seductive in its simplicity and complexity. The IPMS was born from digital model making software, however has never been successful deployed at a human scale. Our ambition for this panel was to use advanced prototyping software, and machines to create a human scale IPMS.
Final Model

Materials Used:
Foam
Fiberglass

Software Used:
Rhinoceros, Power mill

Fabrication Methods:
5 Axis Mill
Fiberglass
Sanding
I was fascinated with weaves from the beginning of the semester. I wanted to explore an articulation that celebrated the act of weaving two systems together in such a way that blurred the origins of each system. By creating this play on dualities, you begin to create a new dynamic relationship between two sides of a single surface. Color plays a major role in my original intention, however my final panel represents a working prototype to that final end goal. Moving forward, color would be the next step in the development of this study.
Final Model

Materials Used:
Metal

Software Used:
Rhinoceros, Mad cam

Fabrication Methods:
Plasma Cutter
Arc Welder
This panel was about efficiency. After struggling during the midterm with assembling my original panel, I spent the remainder of the semester devising a methodology of construction that would be as streamlined as possible. The final panel took a mere ten minutes of construction time after all the components were fabricated.
Final Model

Materials Used:
Metal

Software Used:
Rhinoceros

Fabrication Methods:
Water Jet Cutter
This is a prototype for a facade system that deforms and morphs to create a figural aperture. The brass structure is embedded into the glass through grooves, strengthening the glass and thereby allowing for a large continuous aperture. The structure beneath the facade system is revealed as the facade dissolves into the opening.

The final panel was fabricated with the help of a metal laser cutter at Accurate, a lock and hardware manufacturer in Stamford, CT. They laser cut 1/32” brass sheets, and the pieces were finished with three different textures: brushed, sandblasted, and polished. The metal strips are embedded into a 3/8” thick laser etched acrylic sheet. The leaves are inspired by gothic tracery patterns with a changing halftone pattern that controls opacity and light.
Final Model

Materials Used:
Brass
Plexi

Software Used:
Rhinoceros, Grasshopper

Fabrication Methods:
Industrial Grade Laser Cutter
THE END