This Is Not The Color Yellow | A Thesis On Projecting Materiality

Annagrace Walton
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A Thesis on Projecting Materiality

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Amber Bartosh
I am invested into the notion that materials and light can alter the form of a building. With digital tools we can explore possibilities that are not limited to physical properties of light. We have the ability to project onto a flat surface any image or movie you can choose, but we ignore the architecture behind the screen; the white canvas is preferred. We forget about surface and wall, because our eyes focus on what is projected only. Architecture thus, is pushed into the background and forgotten. Individual aspects as light, materials and narrative can come together to contribute to a new understanding of architectural facades within digital environments. To reconnect architecture to human experience we have to develop a visual narrative that considers how we function and move.
**TABLE OF CONTENTS:**

- Staged Authenticity  
  pg 4
- Time-Line  
  pg 6
- Las Vegas  
- Facade  
- Projection  
- Materiality
This thesis reimagines the traditional materiality of the architectural façade by coupling the functional and aesthetic expectations of the day-lit building face with the supplementary material and narrative possibilities of a projected night time display. Engaging the potential of new architectural technologies, the thesis celebrates both the novel and sensational qualities of physically manifested materials and textures while simultaneously exploring the future possibilities of virtual and augmented materials through digital projection mapping.

Set in spectacle-friendly Las Vegas, Nevada, the test site for this experimentation is the Flamingo Resort in Las Vegas, a pivotal intersection of pedestrian and motor traffic. Re-cladding the generic glass façade affords the investigational creation of a sculptural canvas that is visually activated by both sunlight and the projected image. The image to the right illustrates a series of material studies which examine the capacity of applied cladding to provide transparency, reflect daylight and interact with digital projections.
My evaluation of the use of light, material, and narrative in my and other projects are defined in their own categories, Light as transformative, material performance, and surface narrative.

**Light as transformative**

Light as transformative investigates the two different conditions of light in the project; of sunlight and projected light. Both are different readings of the façade.

**Point of view**

Material Performance refers to how the material acts. This includes the various perspectives someone can surround themselves around the building, whether across the street, walking towards from down the road, driving by, or staying in the building itself. The test site for this experimentation is the Flamingo Resort in Las Vegas, a pivotal intersection of pedestrian and motor traffic. The materiality morphs and is an interactive dance to take on all vantage points. The material must be the quality of a light color or white surface so it can capture the light.

**Surface Narrative**

The surface narrative is the act of projection and the narrative that is created when something is projected onto a building. The role of the projection is to create a new reading of the façade and to create a different kind of experience then people have with a typical building. It might allow the building to speak that existed before or it is digitally demolished.
1. Historic Analysis
x Staged authenticity and how it arrived with the experience economy.
x Themed environments are environments that are multidimensional systems of signs.

2. Las Vegas
x The casino structures are examples of the 'decorated shed'. They are simple buildings designed for gambling or hotel occupancy that are overlaid by elaborate signs, they function as one large sign.

3. Projection
x The sun illuminates Las Vegas during the day that is contrasted with the illumination of the city with neon and 3-D light.
x Materiality applied artificially
x Immersive Environments with Storytelling
x The sign as a computer generated electronic light display.

4. Facade
x Facades are part of the theme- casinos cinematic method of presentation that is geared towards the perspective of motorists and pedestrians - something Venturi, Brown 'A single shot of the strip is less spectacular, its enormous spaces must be seen as moving sequences.
x 'Moving' Facade as one moves down with the strip

5. Materiality
x Casinos have applied materiality on them whether it be a Volcano, A Pirate Ship, or a vale of water.

'Signs in Las Vegas use mixed media - words, pictures, and sculptures - to persuade and inform. A sign is contradictorily, for day and night. The same sign works as polychromatic sculpture in the sun and as black silhouette against the sun; at night it is a source of light. It revolves by day and becomes a play of lights at night. It contains scales for close up and distance . . . Day is negated inside the casinos and night negated on the Strip. The signs are, contradictorily, for day and night.' p.77

Robert Venturi, Denise S. Brown and Steven Izenour
This thesis, when presented, began with a lemon resting in my hand while projecting the ‘color’ yellow onto a projector screen. This tactic was used to explore the projection of material to uncover questions as to why the bold intensity of the projected color is not the yellow. The lemon looks yellow to us as the screen does to you, but not in the same way. In that room, this lemon is subtractively yellow; it absorbs all visible wavelengths of light except yellow light, which reflects back into our retina. But the screen that I used to project the video didn’t produce yellow light at all. It can only produce red, blue, or green light because it is easy to lie to the brain. The wavelength of yellow light falls between red and green, which are slightly activated to tell your brain that what you must be seeing yellow.

It might be lying to the brain that this is red and green, but none of this is fake, nothing is really fake. Every experience and object we have is determined to be very much real since it has existed in time. This staging of authentic parts to create effects to trick the mind is not only apparent here, but in the architecture of themed environments. That yellow is as much yellow of this lemon as the Venetian in Las Vegas is replicated to Venice itself. These themed environments are created from replicating another environment and both are authentic.
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-16</td>
<td>Immersion of special effects in Baroque of Florence and Rome.</td>
</tr>
<tr>
<td>1850</td>
<td>World Exposition, Department Stores, and Amusement Parks. Light.</td>
</tr>
<tr>
<td>1900</td>
<td>Industrialization. New materials—glass, iron, steel, and electric lighting.</td>
</tr>
<tr>
<td>1970</td>
<td>Suburbanization and Signification.</td>
</tr>
<tr>
<td>1972</td>
<td>Learning from Las Vegas. Architecture is sculptural, scenographic, symbolic. Now Las Vegas is a theme park, the city as scenography.</td>
</tr>
<tr>
<td>1973</td>
<td>Dean MacCannell-staged authenticity - staging of local culture to create an impression of authenticity for a tourist audience.</td>
</tr>
<tr>
<td>1977</td>
<td>Jon Jerde. How to captivate visitors, pulling them in and holding onto them.</td>
</tr>
<tr>
<td>1998</td>
<td>Experience Economy. Themed environments situated within the study of consumer culture. Guaranteed fun.</td>
</tr>
<tr>
<td>2001</td>
<td>Michael Benedikt Every place, every product, every service and event in the experience economy becomes themed, as part of an endless carnival.</td>
</tr>
<tr>
<td>2006</td>
<td>Dreamworlds All about technology. Sets used to be paper mache, plywood, and paint; now they are digital simulations.</td>
</tr>
<tr>
<td>2014</td>
<td>Applied Material Rem Koolhaas's Venice Biennale Technology + Cardboard = Reality All about Technology</td>
</tr>
</tbody>
</table>
Earth was transformed after perspective with the administration of public lighting which is first implemented in Paris using urban street lights. This expanded the time frame and the profitability of many economic activities creating earth at that moment into an endless artificial work site, a round-o-clock shopping mall of never ending choices. This led to the Industrialization to the mid-nineteenth century been enriched by the advent of three new genres: world exhibitions, department stores, and amusement parks. New materials of Glass, Iron, and Steel were matched with widespread use of electric light that made them gleam; they appeared limpid, fluid, a transformation of itself, as used in London's Crystal Palace in 1851. Amusement parks were thought as the electrification of 17 c. public gardens. Architecture in the park became banal and decorative to match the speed and light of rides.

Where history started for the themed environment was during the work of baroque architects. Borromini was fascinating in his plasticity of form and his masterful use of false perspective. Berninis work of architecture and sculpture and this colonnade especially. It is a wonder educing, feeling anxiety of this curve leading you into the unseen terminance where you emerge at the point where this cathedral facade is at its most impactful. They were exploring form and emotional response beneath domes of painted ceilings engineered through systems of perspective. There special effects are architectonic scripted spaces where optics, sculpture, theaters, and mathematics operate like mixed media.
The immersion of Special Effects through Painting

- The immersion of the painting, to remove the foreground from the space and privilege the viewer
- The narrative that speaks of the illusion, relinquishing one’s freedom on behalf of power

“Streetmosphere”, the condition of Las Vegas that extends beyond material and mechanical systems, to provide a more entertaining experience

SPACE BECOMES
- ©Briannafied
- ©Assemble
- ©Way
- ©Landscape

Fireworks Show Evernight
1,000 Swinging Ferris
Venetian Hotel & Casino
4-D Movie Theater
Statue of Liberty
Eiffel Tower
Venetian Gondolas
4,000 Rooms & Suites
Baroque Style: immersion of special effects and stage sets.
Beneath domes were painted ceilings. The immersion of the painting.
There special effects are architectonic scripted spaces where optics, sculpture, theater, and mathematics operate like mixed media, where the charm of Artifice exceeds the harmonies of nature itself. This allows a layered navigation of space of the Baroque era.
1800-1850

- Entertainment architecture has been enriched by the advent of three new genres:
  - World Exposition
  - Department Stores
  - Amusement Parks

- They were environments for when the user entered, it was 'in order to be distracted'.
1900

- Industrialization
- Implementation of street light in Paris
- New materials—glass, iron, steel—and electric lighting made them gleam.
1966

- Complexity and Contradiction in Architecture
  - Robert Venturi
- 'Carefully Calculated Confusion'
- **AMBIGUITY**
  - Questions what Good and Bad Ambiguity is.
  - 'Complexity' usually resumes in ambiguity.
  - Ambiguity is based on the confusion of experience through its program.
1970

- Suburbanization
- Before the country was churches and store signs, often in foreign languages. Now people have abandoned religious and ethnic markers, replacing them with signs of prestige centering on the status of home ownership. There was a more frequent use of symbols and motifs characterizing the space of everyday life in both the city and the suburb with 'Signification'.

- 'Signification' involves not only a differentiation of particular material objects, but also a constant reworking of facades and interior spaces by overarching motifs drawing on a broad range of symbols.
· Learning from Las Vegas
· Now they think the architecture is sculptural, scenographic, symbolic.
· Now Las Vegas is a theme park, a Disneyland, the city as scenography.

‘Signs in Las Vegas use mixed media – words, pictures, and sculptures – to persuade and inform. A sign is contradictorily, for day and night. The same sign works as polychromic sculpture in the sun and as black silhouette against the sun; at night it is a source of light. It revolves by day and becomes a play of lights at night. It contains scales for close up and distance... Day is negated inside the casinos and night negated on the Strip. The signs are, contradictorily, for day and night.’ p.77

Robert Venturi, Denise S. Brown and Steven Izenour
• Jon Jerde

• Is the theme-park city, all spectacle and shine, necessarily more enticing than the grit and danger of an authentic urban fabric?

• He describes humans as a herd, coming together and addressing architectural spaces as experiences. He talks about ‘re-lamping’ cities, relighting and repopulating decaying urban cores. He looked at how to captivate visitors, pulling them in and holding on to them.

• Communal experience as opposed to the pursuit of individuality.

• Creates Fremont Street in Las Vegas
Disney world, Luna Park, Malls, and Resorts.

These instances start to emerge the beginning of the experience economy, a term published in 1998 which guarantees fun, it is the melding of material forms and commercial culture that characterizes the present from previous historical periods. Architects as Jon Jerde, who created Ferment Street in Las Vegas, pinpoints how to captivate visitors, pulling them in and holding on to them through technology, material, and form to create experience. Michael Benedikt was thrilled by the role architecture can take for the experience economy through reality and authenticity.

With the emergence of themed environments, they seem artificial and as Las Vegas, their highest aim is to provide the right 'stage' an atmospheric seeing or the perfect ambience. But when does the stage just become a layering of materials, one on top of another? As more recently in the 2000s Rem Koolhaas speaks of the layered condition of material in architecture and the curse to haunt architecture “technology + cardboard = reality”.
As virtual reality and augmented reality fail with its engagement with architecture since it is favored that the digital is projected onto the white, plain surface. Therefore architecture is put into the background and is a blank canvas for projection. I speak of authenticity increasingly because I think as a term it means the authenticity, the genuine, it's always in relation to a reference. So creating a light projection that is authentic to what it's being projected on, that interaction between the two.

Magic Leap is a US startup company that is working on a head-mounted virtual retinal display which superimposes 3D computer-generated imagery over real world objects, by projecting a digital light field into the user's eye. It is attempting to construct a light-field chip using silicon photonics. Created in 2016.
In my research of projection onto already existing buildings, the flat surface is really the most unengaging experience. It is easy to paint over the white, flat surface but when you start with an intricate, highly detailed building; there is the ability to become much more invested into the projection. As the baroque building in the bottom right, it was painted with ornament back in 1936 during the day. The sculpture to the right was created for the projection and has an incredible amount of governing contours and lines and is a white surface, making it ideal for projection.
My projection research last semester allowed experiments that were immersive and engaging, starting with the blank canvas and carving into it to create much more of a 3D reading of it. It was really understanding the surface narrative, to have something be a canvas, and an inhabited sculpture.
But what these lacked were the material performance of the object itself. If I am going to make the screen and projection work together, I had to find a material that was going to engage with light and its reflectivity and luminosity. And the projection screen in daylight retreats and hides away. It is dependent on the projection only at night. But what if they were to depend on each other? Here, I was able to start my tests of the sensational qualities of physically manifested materials I had at my reach. I found the different cut glasses were really engaging because they bounced light to other directions, fabrics that moved and morphed, copper that was indented, the curved surface started to cry out for projection.

I attempted to clad my site, the flamingo resort, with the materials I had ruled out as the most successful based on their materiality and engagement of light.

Could this material be easily painted onto a facade and still engage the projection to a high level, or was it more successful as an actual contoured object?
The material studies were engaging, but they had to be created to really be critical of how they worked in light, material, and narrative. So began the material façade studies. Each study I create attempted to achieve light, material, and narrative to the highest degree.
Based on my studies, what was more successful with light as transformative, the day and night light, was the glass coral and circle glass carving. They had completely divorced with their identities during the night than they had with day. For Material Performance, liquid gold and hoover dam were successful in their engagement with the user. They were constantly changing from every angle and morphing while the user took a few steps. For the surface narrative, the liquid gold worked well in its way to have something really engage with a complex form. The water projection changed perspectives from a front view to a birds eye. The hoover dam didn’t work as well from straight on, but started morphing the man walking when someone viewed it from the side, which is successful in having another, destructive reading of the façade.

These studies lead to incorporating the most successful aspects into the façade design. I had to design a façade that celebrates both the novel and sensational qualities of physically manifested materials and textures while simultaneously exploring the future possibilities of virtual and augmented materials through digital projection mapping.
**Facade VII**

**HOOVER DAM**

- 1. Light as transformative
- 2. Material Performance
- 3. Surface Narrative

Process:
1. Topography from Hoover Dam
2. Laser cut PLEXI-glass and chipboard
3. Spray to Silver

**Facade VI**

**COPPER BUMP**

- 1. Light as transformative
- 2. Material Performance
- 3. Surface Narrative

Process:
1. Sculpt face into Small Indents
2. Vacuum Form
3. Spray to Copper

**Facade V**

**GLASS CORAL**

- 1. Light as transformative
- 2. Material Performance
- 3. Surface Narrative

Process:
- Plexi-glass and chipboard
- Laser cut pieces
- Spray chipboard silver
- Colored Plexi-glass back
1 - Louvers
2 - Motorized Vinyl, Red Roller Shade
3 - Reflective White-and-aluminum curtain wall with Mullions
4 - Wallboard
5 - Header
6 - Radial Support
7 - Mullion
8 - Soffit
When designing the Flamingo, there will be a projector across the street since the developer Harrah’s owns all 6 casinos in that area, which helps with bringing people in and around the area. I am cladding the façade on top of the existing concrete post and beam structure. This skin was created to be the main projection surface. It had to be a light in color, and my process and experimentation designed it to be silver, white metalized tiles, as metallic in light can change from black to white just the way the sun hits it. The 2nd layer is glass tubes and gold stamped panels. The tubes are integrated within the grid of the existing building. The tubes perforate the façade, transferring natural light from exterior to interior while providing some views. The form of the façade created the voids which were ideal opportunities to extend and enhance the space of the room and experience of the user within the projection.
The building is a static object, but I am completely changing the expectations of preconceptions of how you should identify the building through its materiality. The lemon represents the building during the day in natural light. In the same way that we identify the lemon through its own characteristics we also perceive built forms through judgments based on. Its about changing a building from something we pass by, it is not content just sitting on the street. At night, the virtual lemon takes form. We see and react to the lemon but in reality the hidden characteristics. The act of projection transforms the reality of the object into something virtual. The judgement of the object is the same but in reality I was very interested into looking at a very familiar thing, in this case a building, and deconstructing our inherent perceptions to transform it into something unfamiliar. Phenomenological experience that we understand materiality that we have the basic understandings of material qualities. And that relationship between materials creating spatial. Collection of materials, create many to create a built form, how they relate to each other and our perceptions play into most materials, and our perception of those collective characteristics speak to the direct experience of ourselves in the built world.
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MagicLeap. 'Teaser Trailer' MagicLeap, 2015

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