Urban Cinema–Space

Coincident with the new mobility produced by changes in transportation, architecture and urban planning photography brought with it a Virtual gaze – a received perception mediated through representation, a gaze that brought the past to the present, the distant to the near.

The cinema is combination of the mobile and the virtual.

From Window Shopping (Anne Friedberg)
Why Cinema?

(nowadays)

Urbanity

Economy

New technologies
Huge and isolate cinema-theaters
Abandoned Cineplex’s
Enhancing suburban sprawl
Mono-functionality

Demand for entertainment

Places for social meeting

Places for interaction
Economy

- Low admission
- Higher ticket prices
- More aggressive advertising

Percentage of the US population that went to cinema on average weekly
Economy

- Low admission
- Higher ticket prices
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In 20 years:
- Total sold tickets +4.09%
- Box office (inflation adjusted) +4.03%
- Ticket Price +91.25%

Percentage of the US population that went to cinema on average weekly

Emerging Technologies

Virtual reality
Augmented reality
Responsive and engaging environment
Amsterdam, VR cinema
Anne Friedberg  
The Virtual Window

Morton Heiling  
Sensorama

Gilles Deleuze  
Screen Theory
Isolated architecture

Responsive architecture
Media Facade

BIX façade, Kunsthaus Graz

Illuma, Singapore

La Porte, Osaka
Interactive-Responsive Facade

**Performative interaction** – tracking people by cameras and sensors

**Direct Interaction** – tracking position of user and his direction by touch

**Indirect interaction** – using mobile device or other users input

**Mixed reality** – VR or Augmented reality, device and environment
Computational strategy
Collecting data and conceptual architectural decisions

- **Site**
  - **Rhino**: Define borders, open space, obstacles and volumes
  - **Weather Map, sun orientation**
  - **Lines of sight, panoramic view**

- **Python**
  - Branching algorithm
  - Growing and avoiding obstacles

- **Galapagos**
  - Evolutionary Architecture
  - Based on length, volume, sun exposure

- **Ladybug**
  - Climate Analysis of site

- **Grasshopper**
  - Geometry generator
  - Isovist & DecodingSpaces
  - Vision field Diagram

- **Kangaroo**
  - Space modification

- **Weaverbird**
  - Facade openings

- **Hoopsnake**
  - Floor Adjustment

- **Karamba**
  - Construction elements optimization

- **Maya**
  - Overall 3D visualization
Base Architectural Diagram

Site

Rhino
Define borders, open space, obstacles and volumes

Weather Map, sun orientation

Lines of sight, Panoramic view

Python
Branching algorithm
Growing and avoiding obstacles

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Evolutionary Architecture based on length, volume, sun exposure

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Climate Analysis of site

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Generating Geometry

Si
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optimization
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Overall 3D visualization
Isovist & DecodingSpaces
Vision field Diagram
Branching algorithm

1st layer

Recursive system
Simple 2D branching script
Within a field of randomness
Avoiding self-intersection
Recursive loop changing the R value.
Branching algorithm

2nd layer

Checking for borders (polygons) closest points
Measuring distance
Placing or canceling each branch
Branching algorithm

3rd layer

Checking for obstacles proximity (meshes)
Deciding whether to grow above mesh or under according to certain distance.
Placing branches nearby closest point plus safe distance. In case of a further branch outside obstacle – return to zero level.
Curves collection
Split into volumes or paths
Layout
Urban Screen Facade
Inspirational Facades

Media-art facade
BIX façade, Kunsthau Graz,
Colin Fournier, Peter Cook,

Climate regulating facade
AlBahr Tower, Abu Dhabi
Aedes Architects
Night period
Screening mode

Day period
Climate mode
Smart Glass
Intelligent Glass
Switchable Glass

**Thermotropic**
- By temperature
- Passive

**Gasotropic**
- A chemical reaction between gas and coated layers
- Gas leakages, Water condensation, still under development

**Electrotropic**
- By electrical pulse

**Liquid crystal**
- A layer of crystal
- Changing orientation when administering voltage.
- Not efficient for Infrac-red radiation

**Electrochromic device**
- The layer changes its brightness by electrical pulse.

**Suspended Practical devise (SPD)**
- A combination of the two, very efficient still under development, expensive. Ugly.
Line of sights and urban icons
Lines of sight
Mesh surface
Base mesh pattern
Apply forces
Pattern distortion
Project into surface
Horizontal cell forming
Translucidity
First construction layer
Interlocking construction
Outer façade paneling
Plan 1:50

Screening Auditorium
+24 m

Sitting area
+26 m
Passive viewer
Indirect interaction (More activity – faster light movement)
Choosing observer
Direct interaction – illuminate path according to user choice
Interactive player
Light pattern projection between users
Personal space
Process light pattern by user mobile device input
Passive viewer
Augmented reality of the city surroundings
Climate Diagram - Summer
Outside

- Outer aluminum panel
- Mineral wool insulation
- Thermal barrier
- Water gasket
- Vapor barrier

Inside

- Inner aluminum panel
- Bolted aluminum panel
- Steel tube

Control Joint Detail 1:1

Floor panel detail 1:2
Here – 3D model of construction
3D metal printing technology

Space Frame System
3D metal printed Node

Steel Tube

Cone

Bolt

Sleeve