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key word
- Threshold
- Sensory experience

test bed
- Thermal bath house
- Saratoga Spring

AN ESCAPE
THRESHOLD SPACE DESIGN IN BATH

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Threshold, conventionally referring to the line of the door jamb, serves to mark the transition between exterior and interior, or between two separate spaces. Contemporary thresholds are most often underplayed, being deployed as a thin surface, or intentionally minimized in terms of thickness. This thesis argues that the term threshold should be applied to a broader sense of architectural space. When a threshold is stretched and thickened conceptually from a surface to a volume, it can become a threshold space.

This thesis argues that threshold space is simultaneously a place, a puncture in an architectural boundary, and as the in betweenness.
Category: THE THRESHOLD SPACE

as program

Enfilade
frame- door- door

vestibule
door- room- door

court
door- wall- door

pergola
door- ceiling- door

minor surfaces perceived as threshold
major surfaces perceived as threshold

as entrance

layered
frame- frame

scattered
colonnade-wall

centralized
vault-vault

elevated
plinth- door

as materiality

transparent
revealing
time
needed: ☐ ☐ ☐ ☐ ☐
mystical: ☐ ☐ ☐ ☐ ☐

reflected
revealing
time
needed: ☐ ☐ ☐ ☐ ☐
mystical: ☐ ☐ ☐ ☐ ☐

solid
revealing
time
needed: ☐ ☐ ☐ ☐ ☐
mystical: ☐ ☐ ☐ ☐ ☐

screen
revealing
time
needed: ☐ ☐ ☐ ☐ ☐
mystical: ☐ ☐ ☐ ☐ ☐
Contention

This thesis contends that architectural threshold space has the potential to both actively and passively design spatial and atmospheric awareness through sensory manipulation.
In an individual scale, threshold is an envelope that prepares one from surrounding environment. For example, cloth, towel wrap in a bath.
THRESHOLD CONCEPT
DEFINITION
- envelope scale
  - cloth
  - car
  - desk
  - building
- individual scale - skin

SESORY EXPERIENCE
STRATEGY
- glossary
- material

sometimes a car...
Besides physical/tangible threshold, the wind breeze that varied in temperature -
the water, and its different state, mist, fog, ice.
the light, are all considered as threshold as well.
Types of Threshold

When boundary is punctured, interrupted by various method. It formed new kinds of design opportunities to regenerate the circulation experience of one.

This thesis unfold the definition of threshold space and categorize them into five kinds in increased scale. Threshold as concept, a surface plane(B.), as an object(C.), as a wrap(A.), as a field(E.).
TYPES OF THRESHOLD SPACE
**Conceptual Transition**

The installation of video and screen hook-ups invites the visitors to a perception of extended past, it subtly blurs the sensation of being inside or outside the spatial configuration. It reveals the complex nature of a "threshold" as a device, a phenomenon.
Element Noren

Exterior noren are traditionally used by shops and restaurants as a means of protection from sun, wind, and dust, and for display of shop name or logo.

Interior noren are often used to separate dining areas from kitchen or other preparation areas, also serving to prevent smoke or smells from escaping.
Noren

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[2] Bowl wall | double facade

Threshold space as an opportunity for visually penetration on building perimeter. It’s often associate with branding or visual complexity. Synaesthesia would be more focused in this case.
innovative materials usage

A number of innovative materials were used such as a stretchable polymer ceiling material, python textured sheet vinyl flooring and LED floor lighting designed to draw the customer through the store. This project has been extensively published and won numerous design awards.
tactile quality combined with program, lure user communicate with the spatial program in a more intimate way.

With cacoon shape that reminds people of the quality of softness, this design engaged more with Kinethesia.

[1] Cacoon

Threshold as an object have the quality of attracting attention. With its sculptural quality it builds a playful atmosphere.
A combined threshold object can be often associate in to a filed of threshold space. A threshold space can often be used as a filter of circulation that directs the flow.
collection of threshold space

Threshold space as wrap, hugging around programed volume, creating the sense of wandering and play. The moriyama house modeled after traditional Japanese garden. Itself situated in the center of dense traditional Japanese housing district. It break down major program into scatter and recombined them in order to create increased opportunity of social interaction.
SENSE OF WANDER AND PLAYFULNESS

threshold space in none-bath program
the sharp contrast of materiality highlights the different atmosphere in between Moriyama and its surrounding neighbor. The sharp contrast of the width and view along the circulation enhanced the sense of wandering as well.

[1] DYNAMIC WIDTH OF CIRCULATION

[2] COMPARISON OF MATERIALALITY
Materials, lighting, and atmospheric conditions (temperature, humidity, etc) play decisive roles in forming a threshold space.

This thesis investigates the major effects of VISION, KINESTHESIA, HAPTICITY, TOUCH, PLASTICITY, SYNAESTHESIA that can be associated into a threshold design in relation to the function of a threshold space.
The effects of spatial compression and expansion on human awareness.

The concept of past and present that evoke people’s memory.

The optical phenomena that associate with various light qualities (shadow and colour) with designing elements.

The effects of spatial compression and expansion on human awareness.


[2] Steven Holl Light Study
The effects of spatial compression and expansion on human awareness

- The concept of past and present that evoke people’s memory.
- The optical phenomena that associate with various light qualities with designing elements.
- The effects of spatial compression and expansion on human awarenesss
The examination of our environment through movement. Kinesthetic movement is not limited to walking, but can also be head-movement or movement of the eyes.
Haptic touch requires movement of limbs, muscles and skin. Thus haptics is more tend to be considered in an individual scale process of design where materiality is being specially addressed.
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"(...) skinship in the bath thus... is in relation to the person, so the objects such as soap, toys and towels used in the water become a part of the experience of bathing, included in the whole intimate experience. There is a removal of any sense of boundary from divergence in temperatures of different surfaces ... the water is the thick space that holds them and removes any sense of boundary. The water, its temperature and the mixed surfaces all take any emphasis off the surface or skin of each bather’s bdy and, instead, allow a touching at depth. there is no longer any position of tocher or touchee. through these different surfaces, co-bathers connect and are surrounded in a state of mutuality (...)

James J. Gibson, 1966
bath as sequencial collection of threshold

In this thesis, the threshold space serves to direct and stimulate people via specific sensory experiences that belong to the traditions of the bathhouse. Temperature, humidity and light are deployed to affect the speed, mood and volume of flow of the bathers. Conventional programmatic space is underplayed – instead, the project emphasizes threshold space as the primary spatial design factor.
infilled threshold space

Though bathhouses differ by location and cultures, throughout history, there is one common theme threading through the evolution of these buildings - the sequence of spaces associated with the different types of sensorial conditions that the bathers experience as they go through the process of cleansing.
This chapter studies the following questions:

- How much percentage of skin has been exposed in a bathing condition?
- During different processes of bathing, which sensor has the greatest opportunity to be pleased?
- What spatial organization of threshold can be used in designing the circulation of bath?
- In other words, how and where threshold space that is designed with sensational experience components can affect bather?

### Element

**Combo Elements**

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- During different processes of bathing, which sensor has the greatest opportunity to be pleased?
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- In other words, how and where threshold space that is designed with sensational experience components can affect bather?
progressing sequence

threshold space

25°C

28°C

30°C

32°C

34°C

38°C

42°C

temperature

rest space

access point

changing room

sweat stone | turkish shower | sauna

bath

therapy

rest space

exit

32°C

30°C

28°C

25°C

32°C

34°C

38°C

42°C

36°C

34°C

32°C

30°C

28°C

25°C

32°C

34°C

38°C

42°C
threshold as object

changing room

access point

shower
threshold as object

- skin surface temperature distribution of the 20 minute time point after bathing

[Source] Osaka Gas
Conditions: mist sauna bathing = room temperature 40 °C, 10 minutes
bath bathing = hot water temperature 40 °C, 10 minutes

hot  

cold
THRESHOLD CONCEPT

DEFINITION

- envelope scale
- individual scale - skin

SENSORY EXPERIENCE

STRATEGY

- glossary

THE TEST BED

GENERAL INFO

- the program
- the site

- general info
- design strategy
- schematic plan

re-imagined sequence of bathing [1]
Saratoga Springs is known as “the Queen of the Spas.” It was constructed in 1934 as part of President Franklin Roosevelt’s New Deal. It is located 50 minutes driving away from Albany.
The building complex has a rich heritage as a health resort and gambling center for much of the 19th and 20th centuries. Nowadays, the Saratoga Spa State Park is an entertainment complex built with health resort, hotel, swimming pool, golf club, horse racing and theater.
Recently, almost $13 million improvements are planned for Saratoga Spa State Park as part of Gov. Andrew Cuomo’s $90 million investment in the state’s parks. This thesis chose to make additions and renovation to the existing Roosevelt Bath & Spa house I. The identical building right across is the abandoned Roosevelt Bath & Spa house II.
the majority of the customers are locals and from the east coast. The main way of transportation is driving...
THRESHOLD in Bath effect on individual locales
The installation of video and screen hook-ups invites the visitors to a perception of extended past, it subtly blurs the sensation of being inside or outside the spatial configuration. It reveals the complex nature of a "threshold" as a device, a phenomenon.

**EXISTING CONDITION**

The installation of video and screen hook-ups invites the visitors to a perception of extended past, it subtly blurs the sensation of being inside or outside the spatial configuration. It reveals the complex nature of a "threshold" as a device, a phenomenon.

**Rooservelt Bath & Spa Renovation**

9 Roosevelt Dr, Saratoga Springs, NY 12866

Thermal bath with facial massage and bath service
Rooservelt Bath & Spa
Renovation
9 Roosevelt Dr, Saratoga Springs, NY 12866
Thermal bath with facial massage and bath service
existing Rooservelt Bath & Spa
two existing massage bar: 8775 sq.ft/bar

existing major circulation bar
subtraction from existing building

expanded grid system program
2,622 sq.ft 2,000 sq.ft 36 sq.ft vs. 1,892 sq.ft 2,386 sq.ft 361 sq.ft

sq.ft comparison of threshold
comparison of circulation and program threshold
INITIAL TOPO

RECURSIVE SUBDIVISION

Existing roof plane

PRESERVED NORTH WING

STRUCTURE AND PROGRAM GRID

THERMAL CONDITION

SITE STRATEGY

114

115
DENSITY OF COLUMN GRID

A. $x = -6$
B. $x = -6$
C. $x = -5.5$
D. $x = -3.5$
E. $x = +0$

$\Delta +0$
$\Delta +0.5$
$\Delta +2.0$
$\Delta +3.5$
THRESHOLD AS OCCUPIABLE OBJECT
THRESHOLD AS OCCUPIABLE OBJECT
Rooservelt Bath & Spa Renovation
9 Roosevelt Dr, Saratoga Springs, NY 12866
Thermal bath with facial massage and bath service
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Haptic touch requires movement of limbs, muscles and skin. Thus hapticity is more tend to be considered in an individual scale process of design where materiality is being specially addressed.

The effects of spatial compression and expansion on human awareness.

The examination of our environment through movement. Kinesthetic movement is not limited to walking, but can also be head-movement or movement of the eyes.

The optical phenomena that associate with various light qualities with designing elements.
Object
own sense characteristic

Human
way of approaching
Fig. 5: Spatial delimitations

Main room

Fig. 6: Body of the threshold space

Main room

Body of the threshold space

Plaza della Rotonda

thermal comfort in threshold space
Material palette

Thermal comfort in threshold space

Fig. 12: Japanese home, "extendible border"
Fig. 14: Body of the threshold space
5 senses that involved in *conventional design process*:
- sight
- hearing
- taste
- touch
- smell

*reformulate into*

**synthetic design process:**
- **hapticity**
  the act of touching in three dimensional, include but not limited to temperature, pain, pressure and movement.
- **kinesthesis**
  the examination of our environment through movement
- **synaesthesia**
  involuntary phenomenon that collects sensory information from one sense and transfers to another 
  (red as hot, blue as cold)

**Why**

in terms of the creation of place

- **unrecognized space**
  sensory stimuli

  ↓

- **perception of place**
  hapticity
  kinesthesia
  synaesthesia

  ↓

- **recognition of place**

thus the more senses that are engaged with a space, the easier it will be to establish the perception of place.
Haptic touch requires movement of limbs, muscles and skin. Thus haptics is more tend to be considered in an individual scale process of design where materiality is being specially addressed.

A the sound of material
Masayo Ave

B miranda wall
Giles Miller
silicon base layer with 65,000 polypropylene ‘hairs’ attached that can be brushed in different direction to creat images.

C chaple of st. ignatius
Steven Holl
wall that coated with candle and then scratched, so that light is not allowed to easily skim over the corduroy surfaces.
A the stone boardwalk bridge
  traditional Asian bridge

B street view of Pompeii
  traditional street paving

C staircase Brion Tomb|Palazzo Steri entrance
  Carlo Scarpa

D rain room
  Carlo Ratti MIT media lab

E light touch
  Ruairi Glynn and Haptic Architects

For boardwalk in Asian garden design
“[...] stretching visual space by exaggerating kinesthetic involvement [...] to watch his step as he picks his way along irregularly stepstones [...] At each rock he must pause and look down to see where to step next. Even the neck muscles are deliberately brought into play.”

The design takes in account the influences of the direct environment, even to the scale of the surface, on human perception of space as a result of kinesthetic properties of man.

Kinesthetic movement is not limited to walking, but can also be head-movement or movement of the eyes.

Interactive design might be considered in this thesis as well.
When one object/space caught one’s eye, vision triggers stimulation in other senses. Eventually haptic touch verifies the stimulation. The contradiction between the verification and the stimulation is what this thesis pursues for.

this strategy can be used as facade design/ overall concept.
Water injection moulded tiles solenoid valves pressure regulators custom software 3D tracking cameras steel beams water management system, grated floor

Possible Working Principle:

- Environment: the 100 square meter floor area that the visitor walk in

- Input: the sensor (3d tracking cameras) sense the body position/condition (move in the unit area or not)

- Processing: the computer converted signals into matrix that fit the dripping ceilings - and control it’s “on/off”, that is 1/0 in the computer language

- Output: pressure regulators adjust the amount of water that come out through the pipes to the drippers.
Robotic projectors
media servers,
Pani 12kW projectors,
scissor lifts,
computerized surveillance system,
custom software

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- Output: pressure regulators adjust
  the amount of water that come out
  through the pipes to the drippers.
A building type with a designated circulation route evoques sense memories and evokes different materiality. These experiences and visions are formed by the rough, heavy, tight, and narrow characteristics of the building's traditional Swiss housing, which are evoked by the layered rocks and tight, narrow spaces. The building exterior features horizontal slots, traditional building exterior, and a traditional Swiss housing with layered rocks. This evokes the feeling of warm and soft. Memories/knowledge of the cultural and geographic context as background prepares one for an unrecognized space as more familiar. The urban scale and synaesthesia are highlighted in the diagram.


18. “Printable Article: $3M in Fixes on Tap for Spa Park - Dailygazette.com,”

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