MOMENTUM

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The Thesis
discusses ways of **transforming motion**, found in **bodies**, into **architecture**, by clarifying complex **structural superimpositions**. It addresses the **relationship** between **movement**, found in **natural** bodies and **urban** structures and its parallels in **architecture** in relation to time and external forces. Transformational motion can be found in every element.
The thesis defines and **structures** site-specific **parameters**, and **transforms** them into **architectonic** guidelines. Through the integration of a specific program, these guidelines are translated into a **school of performing art**.
NATURAL FORCES

Are transforming every Element through time and specific natural circumstances of a particular place. The result is a wide variety of beautifully formed bodies which are a reflection of their site-related outer influences.
Seasons

are expressions of Forces in Motion.

Organic Bodies influenced by circumstances and specific site conditions change their structure and appearance in relation to time.

Forces of nature form endless wonderful bodies through movement and transformation.
MOVEMENT & TRANSFORMATION IN NATURE
MOMENTUM

Wind, water, light develop constantly changing bodies.
Transformation of Seasons are seen in leaves of trees by changing their shapes and structural bodies. A leaf changes its shape through transformation and movement depending on the site and time-specific forces of nature. It follows a certain natural pattern, defined by specific conditions: e.g. location, orientation, etc. The structure and patterns combined with circumstantial forces define the form in unity with nature.
MOVEMENT:

- Change of position that does not entail a change of location
- The act of changing your location from one place to another
- A natural event that involves a change in the position or location of something = MOTION

GESTURE:

- Motion of the body to emphasize or help to express a thought or feeling.
- The use of MOVEMENTS to communicate familiar or prearranged signals, and express an idea or a passion
- Something done as an indication of intention

SEQUENCE:

- Arrangement in which things follow in logical order or a recurrent pattern
- A following of one thing after another in timely property or condition of occurring at FREQUENT intervals,
- The number of occurrences within a given time period
- An order set of quantities
**Motion:**
A meaningful or expressive change in the position of the body or a part of the body; a gesture.

Manner in which a body moves.

**Flow:**
To move or run smoothly with unbroken continuity,
as in the manner characteristic of a fluid.

**Frequency:**
The property or condition of occurring at frequent intervals,
the number of occurrences within a given time period.
The number of repetitions of a complete sequence of values of a periodic function per unit variation of an independent variable.

**Flux:**
The rate of flow of fluid, particles or energy through a given surface.
Constant of frequent change: fluctuation.
The act of flowing, a continuous moving on or passing by, as of a flowing stream.

**Momentum:**
A measure of the motion of a body equal to the product of its mass and velocity (degree of motion).
Impetus of a nonphysical process, such as an idea or a course of events.
An essential or constituent element = a moment.
Movement and its relation to architecture

Similar to nature, a building is always influenced by its immediate surrounding, and likewise the surrounding influences a building, based on a relation of site and place. Whereby site indicates geography, and place could be described as culture.

In order to integrate a building well into existing conditions, it is necessary to find the relevant forces, for example the major movement at a site, to transform it into architecture.

Understanding of Movement and its frequency, provides the external circumstantial condition of a specific place; it is equivalent to the forces of nature.
A River can be seen in the sense of its flow. It forms spaces within its fluctuation. By translating the river into motion clearly defined zones within the stream become visible. The flow reaches its maximum in the area of no obstacles. Stones wharves are bodies of resistors and force the flow to change its speed providing areas of relaxation. Bodies placed in the middle of the flow transform their shape depending on the stream of water and cause rapids where the water keeps changing directions.
The many bays of wharves provide fields of slow motion in the stream, areas in which movement slows down until it reaches the transition line into another frequency. The boundary line of the river is the crossing point of interlocking energy conditions.
Negotiated Boundary Conditions

The negotiated boundary condition can be translated onto the city horizontally as well as vertically. Whereby wharves reflect places and parks between the building.

The river... a stream
BODIES IN MOTION

The CITY is a place of fast changes:

FASHIONS, PEOPLE FLUCTUATION, TRAFFIC...

Movement of different bodies, traveling on VARIOUS FREQUENCIES, defines fluctuation in the CITY. Every BODY traveling through the CITY has its own FREQUENCY. Together they form a wide range of FLUX.

Pedestrian, bikers, bicycles and cars represent VARIOUS BODIES of movement. Each group has diverse FREQUENCIES depending on their sequence, and are forming an overall FREQUENCY. An OVERLAY of these frequencies gives a complex pattern of FLUX, which is not easily experienced.
FIXED BODIES

Buildings, streets, and fixtures of a city affect the specific speed around them: they form out the sequence. They are the static points of the place through and around which all the movement takes place.

A new building in a city will affect the fluctuating bodies around it, and it demands those bodies to adjust to another frequency.
BOSTON GROWS SIMILAR TO EUROPEAN CITIES

WITH AN IRREGULAR CITY GRID OVERLAYING AND GROWN TOGETHER FROM DIVERSE DIRECTIONS, WHICH FOR AMERICAN CITIES IS RATHER UNUSUAL.
**BOSTON**

is an **ISLAND** in a **STREAM** of **FLUCTUATION**. The city is **BUILT** on the **WATER**: bridges connect the islands with each other. The **RIVER** as it appears today was **FILLED** in by transforming the former “**TRY-MOUNTAIN**” into new land. Along the river a immense **VARIETY OF PIERS** have developed which are **INTERLOCKED** with the stream. Early in its history the various parts of **BOSTON** **GREW TOGETHER**. Diverse **DISTRICTS** differ in **GRID** directions and form an **IRREGULAR, OVERLAPPING CITY GRID**. Main streets are the diagonal connection between each district. **MASSACHUSETTS AVENUE** connects **DOWNTOWN** with **MIT** and **HARVARD University**.
THE SITE

Is located on a Y-INTERSECTION along Massachusetts Avenue, between MIT and HARVARD. The area is marked by OVERLAPPING URBAN CONDITIONS on an edge of CHANGING ZONING.

Towards the north and in the direction of the river the buildings change into WOODEN mid-level income families were pushed out of the area by rising rents as a result of the growth. Along Massachusetts Avenue NEW OFFICE BUILDINGS have risen up between OLD typical for Boston. At the end of the Block towards the west is an old RENOVATED BRICK site, a new COMMERCIAL brick building has grown up. In the block towards the water the old SHOPS, RESTAURANT as well as GIFT SHOPS have already found their place.

The Y-INTERSECTION is also defined by two 15 floor apartment buildings framing the site. 10 FEET CHARACTERIZE THE SITE. As the site is situated between two HIGHLY FREQUENTED MOVEMENT: OF CARS, MOVEMENT OF PEOPLE IN THE STREETS, MOVEMENT IN THE SHOPS related FREQUENCY of happenings, as URBAN CULTURE. By turning around the CURVE, ELEVATION in the surrounding area. This MOVEMENT or speed is to be recognized as you left hand side frame the site.
residences, mostly used by Harvard and MIT students. Former
wooden structures and old residential stone buildings.
Church with a high bell tower east of it, moving towards the
wooden buildings have been restored. Around this area: coffee

A triangular shape and a topographical difference on the
streets, the location reflects an island in between a stream
and in the restaurants and bars, developed a European
coming from downtown Boston. The site appears on the highest
come up Mass Avenue. The two 15 story buildings on the right and
MASSACHUSETTS AVENUE

and MT Auburn Street meet at the highest elevation of both streets, which is at the same time the location of the studied site and its fluctuation around it.

The thesis discusses and seeks to transform these into architecture. The researched achievement should visualize implicit the unconscious energy perceptible.
THE SITE

As an ISLAND in a STREAM underlines the MOVEMENT and SPEED in between which it is MOTION. A concentration of this overlapping movement and motion around the site.

Movement and overlapping of CARS, PEOPLE, SHOPS, OFFICES, RESTAURANTS, PUBLIC CONDITIONS.

DIVERSE FLUX OF:

CARS in the street
PEDESTRIAN on the street
CLIENTS in the SHOPS and the RESTAURANT, WAITERS in the restaurant and shops,
PEOPLE at home
SITUATED. IT BECOMES A VISIBLE EXPRESSION OF THIS
AND PRIVATE SPACES, DIFFERENT ZONING

PERCEIVE MOTION
PERCEPTIONAL MOTION

studied around the site is captured as implicit energy. It is visualized through lines and surfaces as transformational guideline for the design. The reference point, of all spreading out ENERGY LINES, is developed out of the INTERSECTION of Massachusetts Avenue and MT Auburn Street, which is also the HIGHEST ELEVATION in the area.
Energy studies

SELECTED MOVEMENT OF A PARTICULAR SITE

PERCEIVE MOTION
The captured movement is spreading out from this particular point filling in all the surrounding positive and negative edges and voids. With the help of lines starting from the intersection to the major edges of the surrounding buildings, the surfaces of the captured motion, described as energy, was developed.
Energy studies

SELECTED MOVEMENT OF A PARTICULAR SITE

PERCEIVE MOTION
The movement is influencing the surrounding area and defines the site as a particular place of existing buildings, as they have influenced the motion. The diagrammatic drawings visualize this reaction of the energy surfaces cutting.
perceive motion

the city. it influences the

into architecture.

perceive motion
Motion studies in the horizontal direction of movement in the street. The drawings unify fluctuation of moving bodies through the space.
INTERPRET MOTION
Motion studies in the vertical direction of movement in the space. Diverse fluctuation of various bodies are patterned to visualize. Bodies moving through the streets as well as the buildings.
INTERPRET MOTION
Like the water form out spaces of slower motion. Areas of public, semi public and private places, and opening squares of relaxation.
SELECTED MOVEMENT OF A PARTICULAR SITE

INTERPRET MOTION
ENERGY DEVELOPS SPACES

Out of **one point**, which is the **intersection** of MT Auburn Street and Massachusetts Avenue, a **line** could develop into a **curved wall** providing spaces for relaxation.
A OUTDOOR PERFORMANCE GARDEN

on DIVERSE LEVELS with free standing GUIDING WALLS takes up the space at the back end of the area. The place is SURROUNDED by OLD WOODEN RESIDENCES and BRICK BUILDINGS.

The old wooden residences on the site are used for FOREIGN STUDENT RESIDENCIES and allow room for GUEST PROFESSORS.

A CURVED PATHWAY between the existing WOODEN STRUCTURE guides the visitors to the main Building and the outdoor terrace of the RESTAURANT on its first level.
PERFORMING ART AND ARCHITECTURE

The chosen program for the site exists out of a school of dance in combination with a restaurant and a book shop on the lower floors, as well as a studio theater under the roof. The program for the dance school includes rooms for dance seminars, tutor and administration offices as well as a library and a lecture hall.

Performing
Theater and dance use the gesture of the body to express certain conditions. Through dance a carefully defined sequence of controlled movement transforms motion into a work of art. As well as a piece of art is translated into motion through a carefully designed gesture and movement language.

Expression
Every figure captured in a moment translates a specific condition and is therefore able to communicate. The motion or transmission is still perceivable. Captured motion in architecture can as well communicate a specific story.

Architecture
The proposed building is seen as a communicator between its usage and its user and as a reflection of its surrounding as a part of a specific place.
approach from inbetween

the existing structure and the outdoor theater towards the restaurant on the entrance level of the school of performing arts.
Rendering looking backwards to the inbetween pathway

Approach from inbetween
THE ATRIUM

which accommodates most of the circulation spaces in the building. Diminishes in width as one moves vertically, with a corresponding reduction in the speed of movement.
Lower level: level book shop and coffe shop
CURVES AND ANGLES

Stand for the interpretation of diverse frequencies of motion and provide guidelines for functional related spaces within the building.

THE CURVE
Or circle is used to articulate spaces of relaxation to gather together and watch the fluctuation throughout the building. These places are oriented towards the atrium, to watch and to be watched by the fluctuating bodies.

ANGLES
Are expression of a high fluctuation and increase or decrease depending on the movement taking place around them, in order to support the flow of the place.

COLUMNS
Are bundled to underline the flux of the space. Although not readily apparent does their location developed out of a strict 5 feet by 8 feet grid, and provides open floating spaces. The grid is adjusted towards the function, to support the openness and the constructional necessity.

The column bundles are arranged in rings made out of reinforced concrete. In-between the rings the ceiling is open. Light fixtures lighten up these spaces one floor up and one floor below.

The circle of the columns is used to provide places to rest. Columns in different diameter depending on their height and load bearing measurement form out these spaces. The columns extend vertically only as needed structurally and end as stools on the level above.
MOMENTUM

2 Entrance situation through high rise tower walls

3 Street view entrance MT Auburn Street
Transformation of Motion into Architecture

3 Entrance from MT Auburn Street through the open clear glass facade

Three Equal Entrances
3 EQUAL APPROACHES

ARE REACHING THE SAME SPACE: THE ATRIUM.

GESTURES ARE A WAY OF COMMUNICATION THROUGH BODY LANGUAGE, WHICH IS UNDERSTOOD INDEPENDENT OF THE HELP OF THE VOICE ITSELF. THE ENTRANCES ARE SEEN AS COMMUNICATOR OF A VARIETY OF PERCEPTIONS OF THE SAME SPACE FOLLOWING A PASSAGE.

TRANSFORMING MOTION INTO ARCHITECTURE

Entrance from Massachusetts Avenue into Atrium Hall

3 equal entrances
Texture and Material

are used as gestures to communicate fluctuation, change and overlapping of frequencies. The roughness of the surface of natural stone is an expression of external influences. Through time and forces of nature the surface of natural stone was slowly formulated and is continuously slowly changing with passing time.
TEXTURE AND MATERIAL

The roughness of natural stones is used in the building as motion is decreasing or likewise changing into smooth. A stream is being transformed into a smooth surface so also. This effect is supported as well in the choice of the colors beige are reflecting the graduation of different frequency. Smooth shiny materials are used in areas of high fluctuation. The horizontally placed natural stone facade allows frequency of the material. Each row of stone is interlocking fluctuations. In contrast to vertical elements, which are passing body and therefore allow to experience its velocity.
A GESTURE TO COMMUNICATE FLUCTUATION. THE ELEMENTS ARE ROUGH WHERE THE MATERIALS TO EXPRESS HIGH FREQUENCIES. AS THE SURFACE IS THE MATERIAL CHANGING ITS TEXTURE IN THE BUILDING.

For the natural stone facade, WARM colors from dark REDDISH BROWN to WITHIN A MOTION.

PARALLEL MOVING BODIES TO PLACE THEMSELVES IN RELATION TO THE SUGGESTED DIFFERENTLY WITH THE FOLLOWING MATERIAL AS COMMUNICATION OF DIVERSE GESTURES TO EXPERIENCE FIXED POINTS. HORIZONTAL ELEMENTS FOLLOW THE
A READING GARDEN

surrounded by a CURVED STONE WALL to communicate through MATERIALITY and TEXTURE the usage of the space it encloses. The IRREGULAR PLANE of the stones form LIGHT PATTERNS depending on the SURFACE difference between each row of stone, but also within the TEXTURE of each element itself. The SHADE PATTERN of the stone wall is CHANGING by passing time DURING THE DAY. A WATER CURTAIN is supporting this effect as well as REFLecting LIGHT back into the book shop and LIGHTening UP the SPACE inside. The ROUGHNESS and solidness of the MATERIAL as well as the faint SOUND of the FALLING WATER is underlining the SLOW MOTION and space environment as a PLACE OF RELAXATION and MEDITATION.
MOTION, FLUX WITHIN MATERIALITY

MODEL VIEW INTO WATER GARDEN SPACE

DETAIL OF WATER GARDEN WALL

A READING GARDEN OF STONE
VIEW INTO BOOK SHOP AND WATER GARDEN ON THE LOWER LEVEL
A BOOKSHOP WITH READING GARDEN
view into the restaurant on the entrance level towards Massachusetts Avenue

A RESTAURANT OF GLASS WALLS
MOMENTUM