Tracing Corporeality in Urban Space

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Abstract

The aim of this article is to design and offer a seamless and haptic skin / a choreographic surface in İstanbul waterfront based on Laban's movement analysis. The haptic skin is derived from the waterfront corporeal activities such as fishing and swimming and it embodies corporeal movements between Platonic solid and smooth space, such as sitting, laying on, eating, parking bicycle.

Our design offers possibilities for an increased engagement between the body and architecture and is generated through free form finding methods and fabrication. Firstly, the sequences of movements are analysed and visualized through various movement sequences arbitrarily as in the works of Etienne-Jules Marey through video and photography. Secondly, these models are drawn with three-dimensional wireframe digital and real models. And lastly, these sequences are produced by digital fabrication methods in CNC laser cutter and the joint elements will be fabricated in 3D prototyping machine in 1/10 scale.

Keywords

Corporeality, Laban, haptic, urban furniture

1 Introduction

Urban space in İstanbul has been an attraction for residents, and awareness has developed on the use of open spaces over the last couple of years. One of the reasons for this awareness is the unequal share of land held by—and the enclosing and invasion of open urban space by—a large density of private residences, gated communities, gentrification areas and mass housing. Looking back at the history of the urban waterfront in İstanbul, we are confronted with urban water as a separator, as a unifier and as a landfill, accordingly. In the late Ottoman period, urban water was a distinctive and separating element between the peninsula, Galata and Üsküdar because they were connected by boats that were not very safe. Until the middle of the 19th century, İstanbul was a settlement with a concentric macroform. After the second half of the 19th century, the first metropolitanization effects were seen in the Ottoman Empire. Maritime lines, railways and stations, seaports and bridges (e.g., Unkapanı, Galata) were constructed, and central management of transportation investments shifted from the historical peninsula towards the area north of Haliç. Urban water became a unifying space. Marine transportation developments have made permanent residences out of settlements that can only be accessed by sea. The city has developed on the exterior of sea walls and along the İstanbul Bosphorus. Waterfront settlements have turned into residential areas that are the symbol of prestigious groups, although interior valleys have remained as villages (Yenen, et al. 1993).

After the changes in the urban scene in the 1950s, the metropolitanization process brought a population increase. In this period, the managerial and macroform structures had not yet been formed. In the period up until the 1960s, organic relation had been destroyed by a 30m-wide road and, in 1973, the first Bosphorus Bridge. The bridge encouraged individual ownership of houses, workplaces and

automobiles. Through the late 1960s, İstanbul had preserved its identity as a sea city through its scale and urban image. However, after the 1970s, this identity as a sea city has been lost with rapid growth and unplanned urbanization. Population and liberal economic policy effects soon resulted in high-density, expensive metropolitan residential patterns, which have destroyed shore usage. Later, new roads were built along the sea, and then new residents moved in and new roads were constructed (Yenen, et al. 1993).

Compared to many other coastal metropolises around the world, the relationship between the city residents and the water in İstanbul has been more intense and loving; however, over the last five decades, the radical urban interventions of the municipalities have changed the geography of the city. Landfills and vehicular roads are have become the measures of modernization and motorization. On the other hand, these landfill parks are actually the only green spaces where the city breathes. The "sea city" identity has been replaced with that of a "land city." From a city where the fortress walls and waterfront houses rose just above the water, İstanbul has turned into a city where wide boulevards and broad parks run in between the sea and the rows of buildings. Interventions on land have radically changed the natural course of the city edge. Istanbul has lost its coastal character and use to landfills. Landfills have caused the estrangement of residents in the city. Urban water, in its present state, is conceived as a passive element of the metropolitan landscape (Akcan, 2004).

The waterfront in İstanbul houses activities such as fishing, gazing, swimming, catching the ferry boat and working on both traditional and contemporary crafts. To give an example, crafts such as ironmongery occupy both the interior space and a small part of the public space and pavement designated for activities; at the same time, there are fish shops, restaurants, art galleries and contemporary performance activities that take place in the urban space in Karaköy. These activities form a "polyvalent" relationship—"a form that can be put to different uses without having to undergo changes itself, so that a minimal flexibility can still produce an optimal solution" (Hertzberger, 1991). As Hertzberger mentions, function and content are inseparable specificities called a polyvalence. These self-organizing activities on the waterfront are intrinsic to İstanbul; deriving from the specificity of the waterfront, we suggest a corporeal, organic relationship through revealing the potential of water as an active medium—an alternative public space.

2 Corporeality and Laban's movement analysis

Different forms of corporeal movements take place in urban space, whether as a flaneur, as a biker, as a worker or as an observer. The variable uses and forms of our relationship with built space overlap simultaneously in urban environments. During this interaction, what triggers and motivates haptic sense and challenges the body physically?

The aim of this article / project is to design and offer a seamless and haptic skin / a surface that has the potential to trigger multiple senses. Haptic skin can be genetically modified to form several surfaces and spaces to install in the urban fabric.

Haptic sense is related to the sense of touch and to a variety of other senses used in our understanding of space. Triggering our sensorial experience of architecture, we can discuss this haptic form as a polyvalent form or as a rhizomatic relationship between form and content, in the terms of Deleuze and Guattari. Corporeal architecture has been investigated historically mostly through an anthropomorphic approach, as in the works of Vitruvius and Le Corbusier, and understood in two dimensions.

However, for Deleuze and Guattari, a rhizomatic relationship forms a juxtaposition of content and meaning, which become inseparable. Massumi summarizes this juxtaposition as follows:*"A woodworker who sets out to make a table does not pick just any piece of wood...She reads and interprets it. What she reads are signs. Signs are qualities (color, texture, durability and so on). And qualities are much more than simply logical properties or sense perceptions. They envelop a potential-the capacity to be affected or to submit to a force...The presence of the sign is a contradiction of time. It is simultaneously an indicator of a future potential and a symptom of a past..."* (Massumi, 1996, p.10).

"Interpretation consists in developing what is enveloped in the sign. The woodworker brings the qualities of the wood to a certain expression. His interpretation is a creation, not just of a physical object, but of a

use-value, a cultural object...Although the activity of the woodworker may seem to occur on a conscious level as a 'will' or 'intention' translated into action, it is no more subjective than the sign was merely objective." (Massumi, 1996, p.11).The relationship between form and content can be observed in the expression of movement. Marcel Duchamp and Giacomo Balla depicted movement, light and speed, connecting and transforming paths of movement into a dynamic sequence. These paintings created a cinematic effect (Figures 1, 2).

Figure 1: Marcel Duchamp, Nude Descending a Staircase, No. 2 (Marcel Duchamp, 2014).

Figure 2: Giacomo Balla, Swifts: Paths of Movement + Dynamic Sequences, 1913 (Balla, 2014).

In the performance arts, a remarkable approach emerged in the works of Rudolph Laban (1879-1958), who was also initially trained as an architect, dancer and choreographer. Laban analyzed and recorded movement in space. He developed a language of human movement through which meaning can be derived. His analysis, called the Laban Movement Analysis (LMA), formed a language and notations for detailed analyses of body movement, coding specific movement attributes. Further, his methods underline theories and concepts for body movement, such as the basic principles of architecture: harmony, balance, movement and potentiality. His analysis was later used in fields such as choreography and therapy, in which body movement plays a large role (Longstaff, 2007).

Laban's thoughts on dance were later announced by his student Irmgard Bartenieff (1890-1981), who was trained as a physical therapist and developed the "Bartenieff Fundamentals." The Bartenieff Fundamentals include "body connectivity, movement phrasing, energy, form and spatial intent" in a three-dimensional space. For Whittier, they decipher the functional and expressive landscape of movement (Whittier, 2010, p. 236).

Laban was inspired by the "natural and organic movements of everyday life." He found the body's embeddedness as a potential space for expressive movement (Adrian, 2002, p.74). He created

Labanotation as a system which recorded body movements three-dimensionally and in relation to other to other moving bodies and the space surrounding them (Adrian, 2002, p.74).

Laban published a notation named "Kinetographie" (1928) that was later mentioned by Ann Hutchinson Guest and made known as the notation of “Labanotation.” Laban’s dance notation outlined body movements as a three-dimensional extension of space in icosahedron and kinesphere forms. Laban’s analysis, later addressed by dancer Isadora Duncan and her contemporaries, experimented with space through dance in relation to corporeal architecture, as we define it today. For Laban, a kinesphere is a full body-sized area surrounding a person that moves according to the rotation of the body “with directions judged from an egocentric reference system with center conceived to be the center of the body.” The “directional orientation of the entire body is considered as a whole.” The kinesphere is placed three-dimensionally anywhere in the body. When the body moves, the kinesphere also moves. The kinesphere depends on the active parts of the body, understood both as segments and as a whole body (Longstaff, 2014a) (Figures 3, 4, 5).

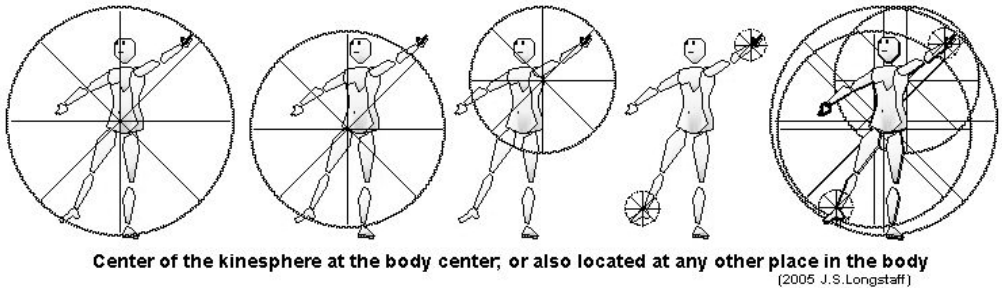

Figure 3: The kinesphere around the human, revolving parts and the body as a whole (Longstaff, 2014a).

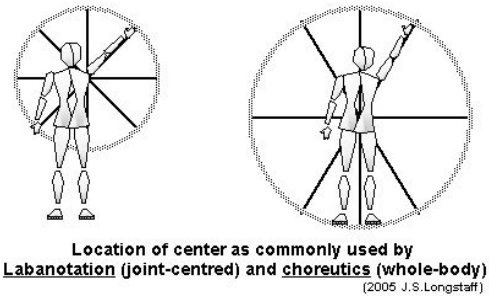

Figure 4: Kinesphere depends on both the body as a whole and joints as separate bodies (Longstaff, 2014a).

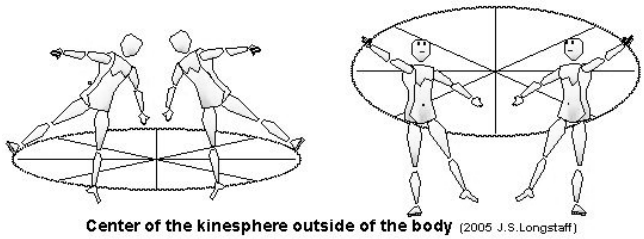

Figure 5: Center of kinesphere in gathering bodies (Longstaff, 2014a).

Laban Movement Analysis (LMA) is a theoretical framework for observing qualitative and quantitative changes in movement, ranging from conversational hand gestures to complex actions. He brought into view the underlying principles that support the concepts of Body, Effort, Shape, and Space (BESS). Laban’s theory deeply analyzes four primary components of movement: Body, Effort, Space and Shape (BESS).

- Body: (Total-body connectivity) “This category emphasizes physical connectedness, refinement in use of the body, movement efficiency, clarity, and sensory-motor connections” and studies the various aspects of the human body while moving. ‘Which body parts are moving?’, ‘How do I

organise my body?', 'What are my body's options?' and 'The body's sensitivity.' This category contains alignment, flexibility, strength and balance.

- Effort: (Energetic dynamics) This category represents our impulses to move based on our attitudes toward the effort factors: Time, Weight, Space, and Flow. This category describes the nature of movement or 'how we move.' The sense or 'inner intention' of whoever moves is studied in this category, which is split into several sub-categories named 'states' and 'drives,' each of which refers to the dynamics of the person in motion.
- Space: (Choreutics, Space Harmony) This category represents our environment, which includes architecture, objects and people. Where the 'mover' moves and how they use space is the most important principle in this category. How movement connects to the environment and its impact is studied extensively and further illustrated in this category. Space acts on the Body, influencing our inner attitudes and resulting in an Effort Action.
- Shape: This category deals with 'why the person in motion moves' (intent) and 'how they relate to themselves, the environment and others' and contains the ways in which these attitudes are articulated through the Body (AgapeBelgium, 2014).

Shape Flow refers to the body's communication with itself. It determines if the Body will Lengthen or Shorten, Narrow or Widen, Hollow or Bulge. The directional movement describes the body relating to the space through either Spoke-like or Arc-like moves. Movement happens when the Body's goal is to form a "bridge" between itself and the space or people. The Shape of this "bridge" determines whether the Body will move Upward or Downward, Backward or Forward. Shaping or Carving describes how the Body adapts to the environment by moving between an inner and an outer orientation to itself and the Space. The whole body moves by molding or contouring itself around objects and space. It forms a three-dimensional relationship between the self and the outside world. The Body may Rise or Sink, Enclose or Spread, Retreat or Advance.

Bartenieff Movement Analysis, sometimes referred to as Laban / Bartenieff Movement Analysis (LMA / BF), uses a multidisciplinary approach, incorporating contributions from anatomy, kinesiology, psychology, Labanotation and many other fields. It is used as a tool by dancers, actors, musicians, athletes and psychotherapists, and is one of the most widely-used systems of human movement analysis today (Figures 6, 7).

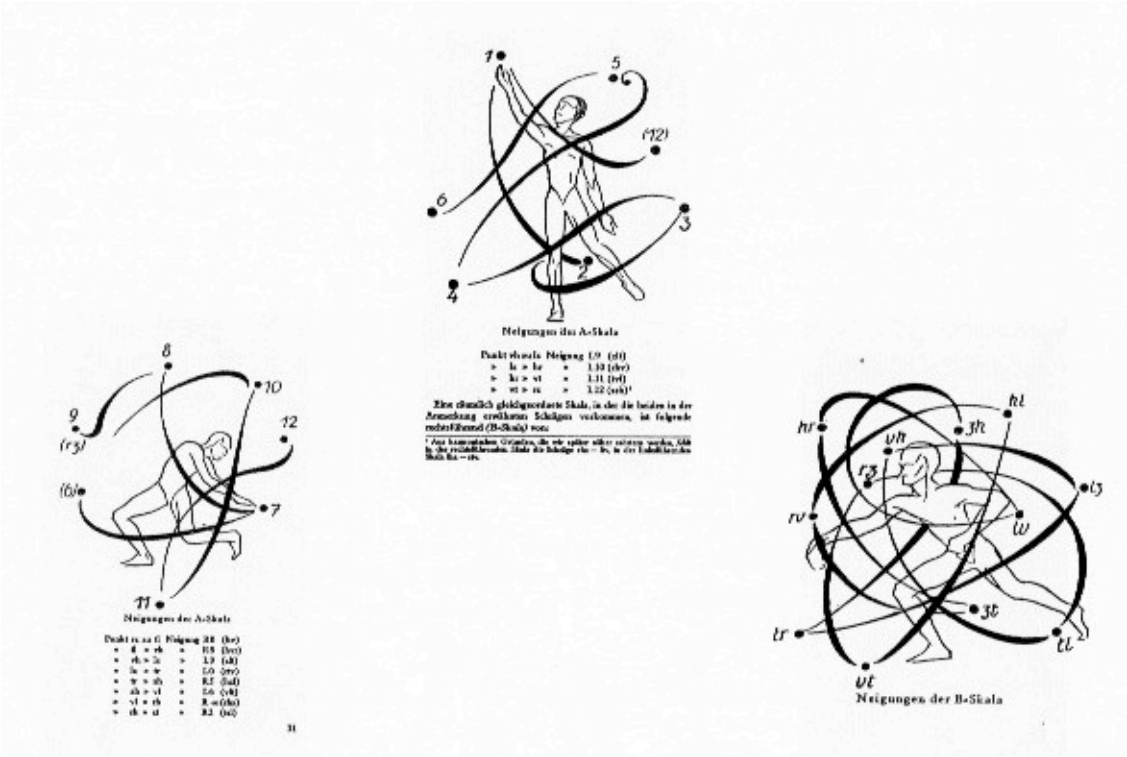

Figure 6: Laban, The "Kinesphere", Possible movement of a human subject (Nijenhuis, 2004).

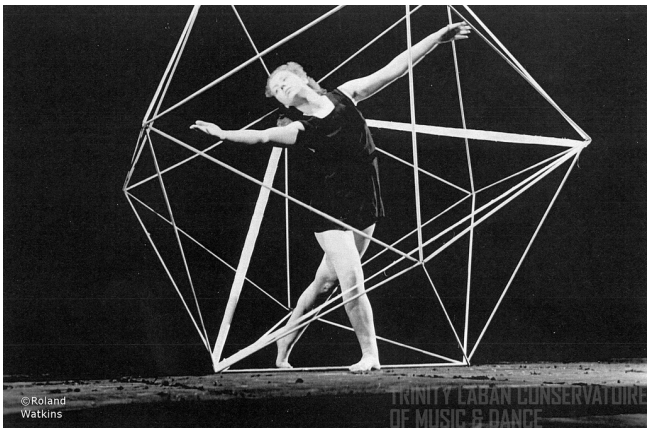

Figure 7: Laban, Gammes Dynamosphériques, Movement Sequence, Photograph of Valerie Preston-Dunlop in an icosahedron at the Art of Movement Studio, Manchester, 1947-1949 (Laban Archive, 2013).

There is an aspect of Shape that interacts very closely with Space, called Spatial Pathways and Tensions. The Spatial Pathways act on the Body, and the Body acts on them, influenced by the various Spatial Tensions. These Spatial Pathways and Tensions have been described in LMA as *Central, Peripheral,* and *Transverse* Pathways or Tensions. The Body will move through Space Centrally or Peripherally, or take a more circuitous Transverse Pathway to its destination.

Laban began to formulate the notion that there is no such thing as "empty" space. He believed that Space has a Life, and that life is movement. To develop a practical application for his theories on "spatial pulls," Laban developed movement sequences called Scales. As the body moves through a Scale, it passes through points in space that describe one of the following platonic solids: Cube, Octahedron or Icosahedron (Penfield, 2005).

"Dimensional planes lead to the construction of an icosahedral - shaped kinespheric net. Laban's theories of space harmony" (Longstaff, 2014b) (Figure 8).

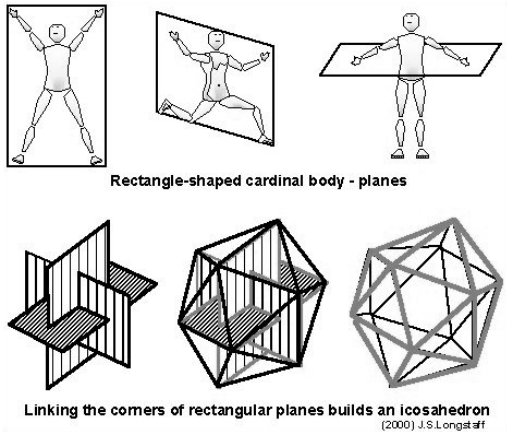

Figure 8: Laban's theory of "dimensional planes" (cardinal body-planes elongated along one of the dimensions) leads to the construction of an icosahedral - shaped kinespheric net (Longstaff, 2014b).

3 Tracing corporeality: Haptic skin

Laban's four categories of body movement analysis can be used to evaluate abstraction of movements, analysing corporeal movements that take place on the urban waterfront in İstanbul. Therefore, we can suggest a haptic skin or a choreographic surface for variable uses in urban environments based on Laban's movement analysis. This article investigates a multifunctional space that embodies corporeal movements between Platonic solid and smooth spaces. Based upon Laban's theory of corporeal movements and solids, our design approach depends on the abstraction of corporeal movement that follows the traces of choreography in various sequences. These sequences of movements can be

analyzed either as the steps of a person running to catch the train or a skater's curvilinear traces in the air, which displays experiences of embodiment of space.

Our design offers possibilities for increased engagement between the body and architecture and can be generated through free form-finding and fabrication methods. The fabricated product can be used in urban contexts for various uses, such as sitting, laying, eating and parking bicycles. We can summarize the relationships on the waterfront in İstanbul as follows: Sand beach, no border, border with landfill and mostly concrete, or floating and sloped with restricted entrance (non-urbanized green areas). From these, activities that take place on the sand beach and in the landfill are taken into account, although the latter can also be observed as corporeal, with respect to the topographical condition. Besides, it aims to revitalize the daily rituals and interactions between citizens and the street tradesmen of the past. The urban structure/surface allows them to be embodied and involved in the space.

1. Visualizing various movement sequences arbitrarily, as in Etienne-Jules Marey's fragmentary scenes of movement through video and photography.

2. Modelling these sequences as three-dimensional, wire-frame, digital and real models.

3. Producing sections of these sequences with digital fabrication methods in a CNC laser cutter; the joint elements will be fabricated in a 3D prototyping machine.

Within these categories, our design involves a suggestion for landfill areas. The first step of the design process is to visualize various movement sequences arbitrarily, as in the works of Etienne-Jules Marey through video and photography. Etienne documented series of images of human and animal movements, such as walking, running and jumping, to study their exact positions in space at determined moments, and then ordered them according to the development of the movement, which was called chronophotographie. Marey's photographs gave visible extension to the present, virtually representing the passage of time (Braun, 1992, xviii) (Figure 9).

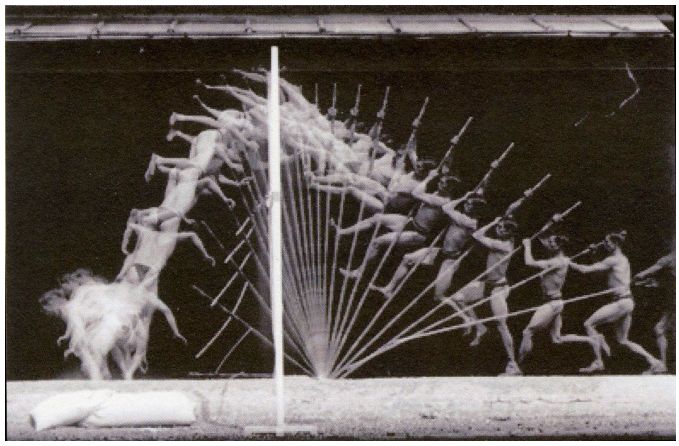

Figure 9: Étienne-Jules Marey, Chronophotography of movement (The Red List, 2014).

Marey thought of "the body as an animate machine." He documented up-and down movements of legs, oscillation of parts of the body and shifts in the body's center of gravity (Braun, 1992, pp. xvii). "He captured ongoing phases of movements and spread them over the photographic plate in an undulating pattern of overlapping segments" (Braun, 1992, xviii).

In İstanbul, as a poly-centric city, different kinds of movements and content occur at the same time. The city is rhizomatic by its nature, and in every part of the city, different ways of living exist. We can give Galata Bridge, a two-floor bridge, as an example of a polyvalent relationship. First of all, the bridge has historical importance, bridging the two distinct sides of the Golden Horn both culturally and socially. Secondly, it is important in the daily life of İstanbul residents. The upper floor is for traffic and pedestrian use, serving also as a vantage point for viewing the İstanbul cityscape. On the lower floor, just above the water level, there are fish restaurants, shops, meeting places and art exhibitions. It is the fishing activity that mixes these typical uses. The bridge is lined with fishermen on both the upper and lower floors. These activities are not planned beforehand, but have developed in a self-organized way over time. Fishermen, craftsmen (metal workers in Karaköy) and other forms of traditional workers still exist in some regions of the waterfront (Figure 10).

Figure 10: The Galata Bridge, fishing lines (Urban Vacation, 2014).

Our second step is to model these sequences as three-dimensional, wire-frame, digital and real models. The last step is to produce sections of these sequences with digital fabrication methods in a CNC laser cutter; the joint elements will be fabricated in a 3D prototyping machine (Figures 11, 12).

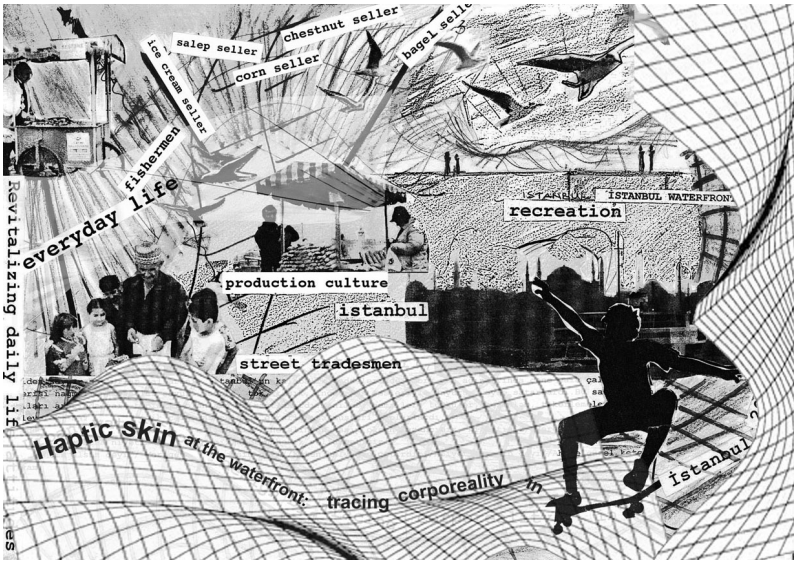

Figure 11: Section of everyday life in İstanbul waterfront.

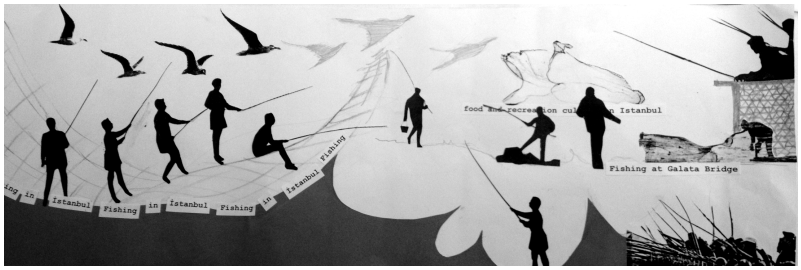

Figure 12: Section of everyday life in İstanbul waterfront.

Dance is a regarded as “simple combinations of directed energy,” as well as motion and stillness. Directed energy is vectorial: it has a length or magnitude and it can be a pathway or line of direction (Gleich, 2010, 79). Vectors exist in three-dimensional space.

Regarding İstanbul, our intention is to evaluate a form—a skin that triggers hapticity and kinesthetic perception of corporeal activities as multiple lines of direction. The design does not enclose self-organizing space that already arises in İstanbul, but goes beyond it in order embody the visible, the invisible and the traces of a potential movement on the waterfront (Figures 13, 14, 15).

Figure 13: Combining movement and daily activities

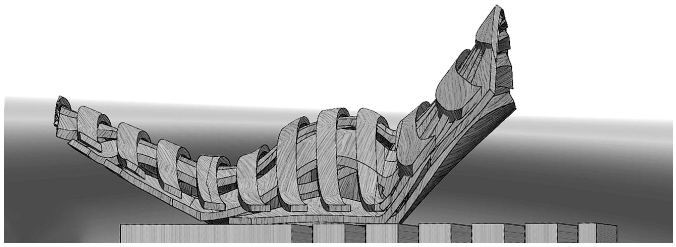

Figure 14: The haptic skin on the waterfront: A kinespheric movement

Conclusion

In Laban's vocabulary, a physical action is the equivalent of elevating a move from a functional approach—i.e., satisfying needs. Movement as an expressive form is regarded as interrelating inner intentions and outer form in the context of the juxtaposition between form and content. The relationship between corporeal movement and architecture has gained much more importance over the last few decades, both in architectural practice and education in free form-finding methods. For these purposes, new methods and opportunities are brought into view through the medium of digital fabrication and by fablabs in architecture, as well as in other professions. Fablabs have become an important bridge between design and manufacturing, enlarging the imaginative vision not only of architects and designers, but also bringing new tendencies into architectural education programs.

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