



Uncovering Lynn's Theory of Architecture: The Role of the Concept of Time for Dynamic Form Creation

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ABSTRACT

Greg Lynn is one of the pioneers of digital architecture. His usage of digital software is based on his effort to integrate the concept of time into architectural design processes. Lynn grounds his form based architectural production into a theoretical basis, which aims creating living, breathing and interacting organisms. Studies related to Lynn and his projects mostly refer to his form generation concerns employing digital software. However, Lynn's approach is not merely a form-focused approach. While Lynn's form creation studies could exist as a narrative independent from the concept of time, all the studies are actually products of an integrated architectural discourse. Different from the studies that focus on form generation, this study focuses on the formation of Lynn's time-based architectural design approach, and analyses Lynn's architectural theory. It expresses a different conceptual narrative and perspective. It clarifies and discusses the mechanisms that Lynn uses to express time in the digital environment. In this way, the instrumental relation between time and Lynn's architectural design is addressed.

Keywords: dynamism, form, motion, parameter, time, topology.

1. INTRODUCTION

Greg Lynn is one of the pioneers of digital architecture by embracing a non-Cartesian approach. He is also an advocate of the dramatic change in the design and discourse of architecture during the early 1990s, which was the cause of the employment of interactive animation software in architectural design processes. Previously used in industries such as movie industry, animation software introduced smooth, continuous and non-Cartesian forms into architecture different from polygonal and rectilinear forms (Rocker, 2004; Rakatansky, 1999). Lynn's usage of animation software is based on his effort to integrate the concept of time into architectural design processes. He grounds his form based architectural production into a theoretical basis, which aims creating living, breathing and interacting organisms. Time's temporality and variability are expressed through varying force fields and motion in design field, and integrated into architectural design processes for creating dynamic processes and forms. While revealing and legitimating his assertion of dynamic architecture, Lynn refers to time as the motion in the design field. Form grows in interaction with the forces, which creates responsive and dynamic architectural designs. Lynn (1999a: 11) addresses in the book "Animate Form," "rather than as a frame through which time and space pass, architecture can be modeled as a participant immersed within dynamical flows." The relation of Lynn's architecture to dynamic forces in the design field is one of the basic arguments in his architectural theory. According to Lynn, architectural design develops in relation with its context through time as he (1999b: 269) expresses, "the process of developing in time involves an internally constrained organism unfolding in complexity within a contextual field of influences." Delalex also (2006) relates Lynn's architectural approach to simulation and manipulation of dynamic moving forces through time situated in context.

Form creation studies of Lynn have been continuing since 1992 when Lynn's office "Greg Lynn FORM" was launched. Lynn focuses on form creation and discusses questions of form in his studies as he states: "I felt like the field was losing its claims and discourse on form.



So I decided to throw down a gauntlet for myself and claim form" (Rocker, 2004: 89). Lynn's focus on form creation is related to his teacher and mentor Peter Eisenman, who also worked on form generation processes since the early 1970s (Rocker, 2004) and is also emphasized in many architects' and designers' discourses. For example, in his essay of "Towards a New Architecture," architectural theorist Jeffrey Kipnis (1993) emphasizes that architecture theorists like Greg Lynn started to focus more on transformation of space and geometry and the generation of new form. In her interview with Greg Lynn on *Calculus Based Forms*, architect Ingeborg M. Rocker (2004) discusses Lynn's focus on form generation and search for ways of producing architectural forms.

Lynn expresses and identifies his form creations that were generated in digital medium using complexity, smoothness, pliancy and curvilinearity. Complexity is related to the dialogue between a building and its context and the reaction of the building to its environment. Smoothness and pliancy mean incorporating differences and free intensities in the field and thus being dependent on contextual influences for self-definition. As contextual influences are the external forces which are on the move continuously (Lynn, 1993a), it is possible to draw a parallelism between Lynn's scope of using smoothness for a continuous change of dialogue between context and form with philosopher Gilles Deleuze's description of smoothness which is described as "the continuous development of form" in his book titled "A Thousand Plateaus: Capitalism and Schizophrenia" (Deleuze, 1987: 478). On the other hand, curvilinearity defines geometry of form, which is generated in a close relation with the site and the field forces in that site. Lynn (1993a) calls curvilinear geometries inexact geometries and states that it is impossible to generate the same geometry on another site because of the unique and specific context where form is situated. In relation to the new form creation language where concepts of complexity, smoothness, pliancy and curvilinearity come to the fore, Lynn focuses on form-site integration in his studies and defines motion in the context as a generative force for his architectural design approach.

1.1. Aim

Studies related to Lynn and his projects mostly refer to his form generation concerns using digital software. Lynn is mentioned with a focus on digital design and production processes rather than his theoretical thinking and architectural approach. For example, Delalex (2006) addresses Lynn's form generation concern considering the relationship between form and field forces. Jencks (1999) discusses Lynn's evolution processes of form through his H2 House project and his design approach, which includes responsive form generation based on force fields. Bird & LaBelle (2010) examines Lynn's form generation processes through Lynn's Embryological house project. Rocker (2004) talks about Lynn and his projects focusing on the ways of integration of movement in context into form generation process using digital software. Kipnis (1993) addresses Lynn's studies of transformation of space with the aim of producing new architectural forms.

While Lynn's form creation studies that were mentioned above could exist as a narrative independent from the concept of time, all these studies are actually products of an integrated architectural discourse. Lynn's approach is not merely a form-focused approach. His aim of using digital tools is not just for form creation as he states: "to try to understand the appearance of these tools in a more sophisticated way than as simply a new set of shapes" (Lynn, 1999a: 17). Different from the studies that focus on form generation and context relations, this study focuses on the formation of Lynn's dynamic architectural design language by examining his references to time. It expresses a different conceptual narrative and perspective. It uncovers how Lynn grounds his form generation focused discourse based on time. In other words, the article aims to understand Lynn's architectural theory to uncover the instrumentalisation of time concept for grounding his form creation studies.



1.2. Methodology

For understanding the formation of Lynn's time-based architecture, the article analyses Lynn's architectural theory. It clarifies and discusses the mechanisms that Lynn uses to express time in the digital environment which are analogy, re-conception and construction of a metaphorical relationship. In accordance with this aim, Lynn's written, drawn and verbal productions are analyzed, rather than his architectural productions. Lynn's architectural productions are used only for some conditions; the basis proofs for instrumental relation with the concept of time are gained from Lynn's own productions. So, images in the article are selected from Lynn's studies for supporting his new architectural approach and explaining the tools that Lynn uses for materializing his time-based theory. This kind of an analysis brings about a discussion of the relation between the time concept and Lynn's architectural design. In order to prepare a conceptual background and do this discussion, the paper is organized under three headings by aiming to explain the main mechanisms that Lynn uses to realize his architectural approach. Under these headings, time is discussed as temporality of design field, parameter and topology. Temporality of design field is discussed in relation with the motion in the design field, which transforms continuously during the architectural creation process, referring to the notion of time. Parameters are studied for understanding how Lynn turns time into something numerable by recording the temporality of time into the design process. Topology is studied to reveal how time is realized and materialized in the form of buildings. Lynn assigns meaning to time as a creative force for his architecture and shapes dynamic images of form as topology in his architecture.

For the discussion that tries to reveal the background thinking of Lynn's time-based productions, Lynn's different discourses and texts about Lynn are compared and combined. The relations between the texts and the visuals are revealed. In this way, different from the readings related to Lynn's form based concern, a new perspective is proposed towards Lynn's architectural theory that focuses on time. Lynn's embodiment of time in digital context over the mechanisms he uses are discussed. In this way, the instrumental relation between time and Lynn's architectural design is addressed and revealed.

2. TIME AS TEMPORALITY OF DESIGN FIELD

In Lynn's design approach, design context is a dynamic space of communicating forces. Lynn explains the changing dynamic motion in the context by referring to the concept of time. Indeed, an analogy can be said to exist between the concept of time and Lynn's theory of architecture, as they share similarities in their underlying structure including temporariness, dynamism, movement and continuous change. Lynn transfers temporariness of time into his design approach. Time is a reference to the unstable relationship between architecture and the temporary character of the design field that is the result of the continuously changing motion and field forces. Hence, an analogy mechanism is constructed between time and the dynamism/variability of Lynn's design process where architectural form is in a continuous interaction with the field forces. Lynn integrates these field forces into architectural design process, which he defines as animate. Animate design is a combination of architecture and external context forces varying over time. Lynn (1993a: 15) defines his animate approach as "a complex system into which external particularities are already found to be plied." The design field is considered as a dynamic space of interactions rather than having an inert and a static character. Time-architecture relation changes during the whole design process because of the changing intensity and location of force fields and motion in context.

In his time-based approach, Lynn reads the architectural design process as a dynamic process and integrates the field forces in the dynamic context into form creation. Lynn creates an analogy between the dynamic cycle of nature and his architectural design approach. He aims to create a design process similar to how natural processes are produced. He uses the natural processes as guide to himself to create an architecture that corresponds to the dynamic and temporary character of the design field. Nature is in a



constant state of change, and architecture must keep up with this temporality. Form should grow and evolve with its shaping forces and respond to its context. It is possible to find Lynn's concern of dynamic process and time relation in his expression of "time-based forms" in his declaration of "Geometry in Time." Similar to Lynn's dynamic design approach, architectural theorist Charles Jencks (1999) also advocates that events should be captured in architecture in order to achieve a sense of time.

Lynn expresses that architecture has still a static character, but the animate approach can lead to dynamic architectural designs (Lynn, 1999a: 10). Hence, Lynn tries to create a dynamic architecture and refers to the concept of time for legitimizing his search for dynamism. Delalex (2006) defines Lynn's dynamic design approach as a field-focused approach, and according to him, this approach indicates a shift to a new model that embraces the complexity of urban contexts, multiplicity and collectivity. There is a shift from neutral space where there are only internal forces for self-definition to dynamic space of interactions, as Lynn (1999a: 11) states there is "a move from autonomous purity to contextual specificity." With the shift of emphasis from static objects to living dynamic fields, Lynn redefines the design space. The result is a design that is formed by the invisible environmental forces that change over time as Delalex (2006: 36) states: "it gives the illusion that the complex field of forces that Lynn simulates around his buildings was suddenly materialising, turning into the building itself."

Architectural theorist Sanford Kwinter also sees the world as a dynamic and complex system where the world cannot be understood only by its inner spatial configuration. In his book "Architectures of Time," Kwinter (2001: 24) emphasizes the effect of the theory of time by asserting that, "if time is real, then the world represents a complex, infinitely entailed, dynamical system of fluid manifold." Such as in Lynn's dynamic design approach, the world can be understood only with the integration of time and through the affects produced by the motion and force fields that pass through. The world transforms because of the energy and information flow over time. Volatility of time is captured from events through the form of the building and time is spatialized in Lynn's architecture because of the information exchange between the building and its context (Kwinter, 2001).

2.1. Biological Models

There is an analogy between biological models that explain natural/evolutionary processes and Lynn's architectural design process. As organisms change, live and evolve through time, Lynn's animate design process also evolve as a result of the changes in the design field through time. Considering this parallelism, Lynn refers to natural/evolutionary processes for creating a dynamic architecture and claims that the theory of evolution can be an explanatory feature of his dynamic architectural design processes. For example, in his "Bio Time" declaration, Lynn relates his ideas of growing, interacting and developing forms over time in dynamic design processes to biological systems. Living organisms take genetic algorithm and biological growth as the bases for form generation. As living organisms have DNA where humans' genes are encoded in, Lynn reads architectural design process also as a DNA structure where design information are encoded as parameters. As the way living organisms including animals, plants and human body grow, interact and develop through time and achieve an adult form, Lynn reads design process also as a developing and growing process through bio-time. There is a beginning and an end. The elements of the process are in interaction with each other and the end product embraces the signs of the chaos and differences coming from the dynamic creation process. Form is an evolving and developing construct within developmental time rather than having a static characteristic through which time passes (Lynn, 1999b).

The water drops are other biological structures that Lynn refers as an inspirational starting point for his dynamic design approach. Like when two water drops come closer and relate with a cohesion force, isomorphic polysurfaces (blobs) having influence fields also relate with each other and the context. As blobs come together and interact with each other,

surfaces of the blobs deform and constitute a single surface at the end of a fusion process. (Fig. 1). Lynn (1999a: 30) defines the involvement of external and internal forces into the design process as “the fusion of multiple elements into an assemblage” in his book “Animate Form.”

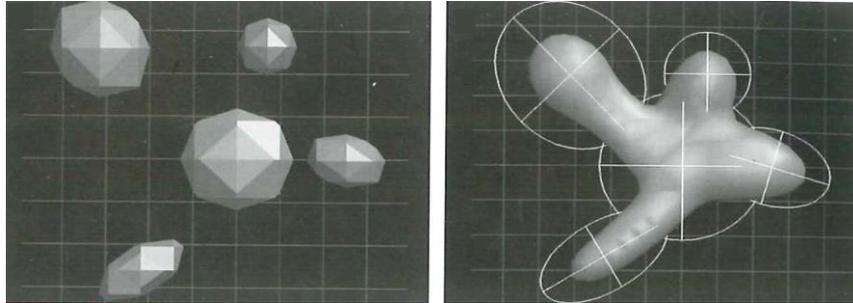


Figure 1. Curvilinear surface constructed from blobs under the influence of the attractive forces in field (Lynn, 1999a: 31)

Lynn also adopts the idea of moving and flowing water as an inspiration for his dynamic architectural approach. Such as the way movement of water, properties of flow, turbulence, viscosity, and drag are considered in naval design for the creation of a convenient and running form that is responsive to context; Lynn also interprets the context forces as dynamic and variable forces whose intensity and direction can change as time passes. In naval design, multiple points of sail are calculated and resolved in the surface of the form and the way these vectors are experienced is based on performance; how sail information is turned into mathematical definitions cannot be understood, calculated and stored on the surface just from outside. The vector flows can be unfolded through analyses and use (Lynn, 1999a). On the other hand, integration of time does not mean that the shape of the hull form will also change as it moves, as Lynn (1999a: 10) states; “an ethics of motion neither implies nor precludes literal motion.” While form has static coordinates, movement in the active context contributes to the design of the form. Based on the interaction between the hull and its context during design process, the hull can perform under various conditions of sail such as sailing downwind or sailing into the wind. Thus, form can adapt to various conditions continuously without any need for changing its shape (Lynn, 1999a).

2.2. Role of Computer Technology

The developing software technology has a crucial role in Lynn’s approach as Lynn benefits from computers for integrating motion and constructing an architecture that has a dynamic and animate character. Lynn also integrates changing density, direction and movement of the field forces into design process using computers and turns the invisible constraints of the site into visible force flows. Computers act as the media for managing shaping forces of the cities and integrating them in description of form through time. By using advanced computer technologies, it is possible for architects to engage time and motion in design (Lynn, 1997). Constructing a dynamic architecture takes place through a process of interaction between the designer and the computer (Franken, 2003). By referring to mathematics and physics, historian Maria Luisa Palumbo (2000: 60) states that the virtual world of computers enables architects to visualize time as the physical forces in the context. By the animation and special effects software tools that were already being used by animation and special effect industries; Lynn materializes time, simulates architectural design and time interaction, and deals with time as a generative force for the architectural design process. As various force fields move around the surfaces of the form in animate design, architectural design also has a dynamic shape. Change in geometry of form is a sign of change in force fields (Lynn, 2013).

Interaction between various industries and disciplines such as mathematics, geometry, biology, genetics and architecture have crucial importance for constructing Lynn’s time-based approach. Lynn uses the technologies and knowledge used in science in his



architectural design approach. For example, with the advent of computer-aided design, architects including Lynn (1999a) started to use calculus more frequently and efficiently for recording numerical time data into dynamic design process and for creating time-based forms. Moreover, for creating the formal expression of dynamic architecture, tools such as NURBS curves, genetic algorithms, parameters and topology are transferred into architecture from disciplines of mathematics, geometry, biology, genetics (Altun & Örgülü, 2014). This integration contributes to dynamic architectural creation studies of Lynn. For example, Lynn (1999b) refers to calculus from the mathematics discipline for representing time as a continuous sequence and for measuring varying intensities of contextual forces, thus notion of time, as he (1993b: 11) asserts, it is calculus that “continues to drive the field in terms of formal and constructed complexity.” Considering the generation of time-based forms, Lynn (1998: 166) emphasizes the necessity of technical knowledge for constructing his architectural approach as he states, “we need to become more advanced in our technical knowledge of time-based forms and to develop at least a working understanding of topological surfaces and their underlying mathematics.”

While Lynn refers dynamic design processes and the temporary motion in field for expressing time during architectural creation, parameter and topology are the other relational mechanisms that Lynn uses to construct and integrate the notion of time into his architectural productions. Parameters are the mechanisms that Lynn use for redefining the concept of time and transforming the temporality of time into permanent information, whereas topology is another mechanism for constructing and creating the formal expression of dynamic architecture and hence, materializing the notion of time.

3. TIME AS PARAMETERS IN VIRTUAL DESIGN ENVIRONMENT

Lynn transfers the notion of time into his architectural design approach also by using a different mechanism, which is re-conception. Lynn’s approach indicates a marked change in the meaning of time. With the help of computational design tools, Lynn turns time into something numerable and transforms the temporality of time into permanent information that is recorded as numerical parameters into digital design process. Hence, Lynn creates a semantic shift on the real meaning of time. Lynn interprets time as something real and captures it as a creative force in his dynamic design processes; as Bernard Tschumi (1999: 173) states, “time is not a thing of the past but is appropriated as an act, with its creative or unpredictable dimension.” Lynn handles time in virtual design environment numerically and records the numerical data into architectural design process as parameters. Parameters stand for the motion in the context, and the interaction of multiple parameters form the shape. They are the tools that Lynn benefits from for materializing the intangible notion of time in virtual design environment. Lynn (1999a) makes an analogy of his architectural design approach with a study of Scottish zoologist Sir D’Arcy Thompson for emphasizing how configuration of parameters of field force affect the shape of the final product. For explaining this analogic relation, Lynn refers to Thompson’s study of the transformation of morphology of animals through the deformation of a flexible grid in his book “Animate Form” (Fig. 2). Temperature, force of gravity, wind force, intensity of pedestrian movement, and intensity of car traffic are some of the parameters as numerical fields of deformative force that stand for the notion of time within the dynamic design process. Deformation does not indicate any loss in the structure; it is the change that form undergoes because of the changing design inputs during the design process. Hence, as field forces change through time, the form also deforms and transforms during the design process in Lynn’s architectural approach. Palumbo (2000: 60) reads Lynn’s approach as “the deconstruction of the architectural organism” for creating a fluid, flexible and living form. The form deforms, folds and stretches until it dissolves in its environment and becomes a part of it because of the interaction between building and the ground, architecture and the site.

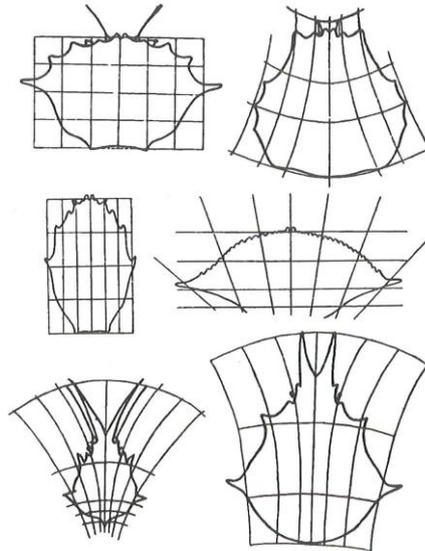


Figure 2. Transformation of morphology through deformation in shape by D'Arcy Thompson from Thompson, *On Growth and Form* (Lynn, 1999a: 27)

Time is the generative force fields in context and for Lynn, there are various interacting forces in design field that transform over time. Environmental forces like wind, sun, gravity, pedestrian movement and car traffic correspond to the motion in the context. There can be also conceptual attractive or repulsive forces that affect the entities in design fields. These context forces have changing density, direction and movement through time. In his animate approach, Lynn records these field forces into the computational design process digitally by using parameters. While one specific parameter stands for time, more than one parameter can also stand for time and rule the dynamic design process. In addition, selection of which forces to integrate as time is based on the project's conceptual approach. While pedestrian and car movement in the site can stand for time, wind force can be the only force in another project. Identifying which field forces are to be used as numerical data during the design process has an impact on the forms that result. Even though field forces have an effect on the final form, the surfaces that emerge at the end of a design process like the one Lynn adopts can have unpredictable forms. The architect identifies the design criteria and organizes the input parameters and their relations; however, the design process can end in a way that the architect could never imagine. Jane and Mark Burry (2010: 56) assert in their book titled "The New Mathematics of Architecture" that, "the key idea of emergence is that it gives something new, more than that which is put into it." Hence, although planning and organizing the developing and growing process through time is important in Lynn's approach, there is a possibility of form to emerge indeterminately in digital medium.

The force and motion in the field is also not static and change continuously. The change of force and motion fields in the design field also causes unpredictable results as Jabi, Soe, Theobald, Aish, & Lannon (2017: 99) state, "Humans cannot possibly predict the effect of change of parameter values. The finetuning of parameters may not be done with the aim to create a familiar pattern, but to follow an unexplored route that can take the designer into new and unexpected regions of the design solution space." However, unpredictability does not mean that the final form is arbitrary because the form emerges based on determined constraints and borders. Information is recorded on building surfaces and thus, every detail on form has a rationale behind it.

Integration of field forces into the design process, interaction of design with its environment and thus, the emergence of time-based forms can be traced in many projects of Lynn. For example, in Lynn's protective roof and a lighting scheme for the bus terminal in New York for Port Authority Gateway Competition Project, Lynn expressed time by using the

pedestrian, car and bus movement and invisible field of attraction that were present on site (Fig. 3). In Lynn's House Prototype in Long Island project, Lynn interpreted spheres of influence of obstacles and attractors in site as time. In Henie Onstad Kunstsenter Installation Design project, gravity in the site was integrated into the design process. In Lynn's Artists Space Installation Design project, conceptual nodes were created and their interaction through time resulted in a main form (Lynn, 1999a). In Hydrogen House Project, the angle of the sun stands for time (Lynn, 2013).

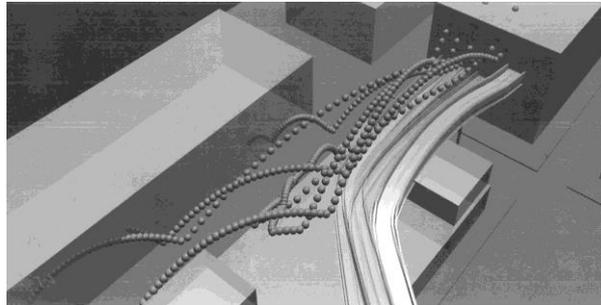


Figure 3. Geometric particles changing location based on influence of the field forces during design process, Port Authority Gateway Competition Project, Greg Lynn (Lynn, 1999a: 108)

Accordingly, Lynn uses re-conception to express the concept of time in the digital environment and use parameters for recording the time data in virtual design environment numerically as if it is something tangible. By using parameters, Lynn grounds his digitizing of dynamic design process to a rationale.

4. TIME AS TOPOLOGY IN LYNN'S ARCHITECTURE

Lynn uses topology as an instrument for materializing the notion of time. He aims to provide this materialization by establishing a metaphorical relationship between time and topology. He materializes the animate design process and constructs various geometries with the usage of topology. He creates a time-based architecture and what is meant as time-based architecture is the effort of architecture to keep up with the variability of time. Hence, the use of topology exemplifies the relationship between time and form. Each form is a frozen moment of a process and represents a point in the way of becoming.

Lynn constructs form's dynamic image and expresses surface-based formal expression by use of topology. He builds dynamism and integrates time into static form through topology. Topological entities are the timed geometries (Lynn, 1998: 165). Topology has surfaces where numerical time data is stored as parameters; thus, every curve and contour on the surface has a meaning and response to the context. It is a flexible surface composed of splines. By splines, multiple forces in site are structured and stored. Ability to store multiple parameters, embodying serial flow of these parameters within the same continuous form, featuring vectorial attributes and thus, time and motion are the reasons why Lynn uses splines for constructing topology, rather than lines and points of the Cartesian system (Lynn, 1999a).

In a dynamic design space, there are various changing field forces; thus, parameters. As new parameters are recorded into the design process, shape of the form changes and transforms while remaining continuous. Form responds to its changing context like a viscous fluid deforming in the direction of exerting external pressures (Lynn, 1993). Thus, Lynn's architecture interacts with the environment by its curved surface and time is the exerting external pressure. Lynn captures time using topology and defines his designs as "the frozen moments of a temporal sequence" (Kwinter, 2001: 173). He asserts that the formal expression of time and motion can be achieved through the usage of splines and topological surfaces (Fig. 4a-b).

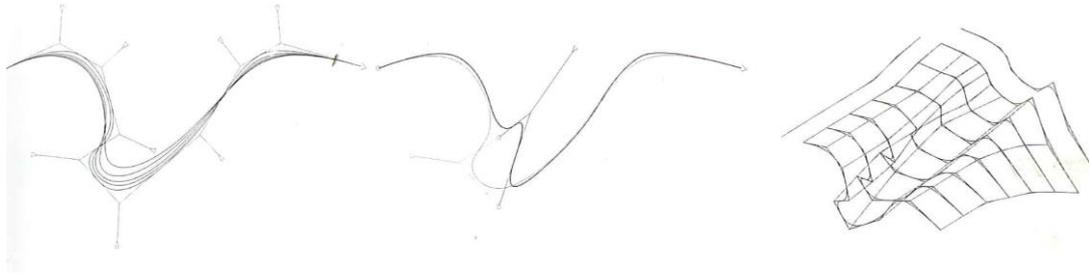


Figure 4a. Lynn's topological surface studies (Lynn, 1999a: 25)

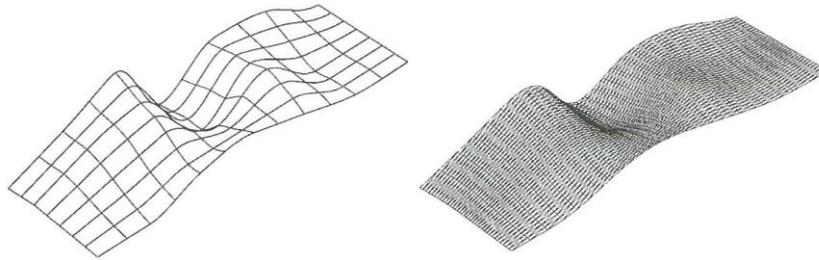


Figure 4b. Lynn's topological surface studies (Lynn, 1999a: 18)

Combination of motion, parameters and topology allow Lynn to design in an animate rather than a static medium as Lynn (1999a: 32) expresses, "rather than an entity being shaped only by its own internal definition, these topological surfaces are inflected by the field in which they are modelled." As a result, if a topological surface is moved in space, its shape changes in respect to the force field in the context. As Bernhard Franken (2003: 125) states, "form follows force;" form evolves with integration of time into design process. However, Lynn does not suggest that buildings should physically move or be movable. According to him, designs respond to external forces just by embodying them as design information in their topological surfaces. Lynn tries to engage his projects with the urban context through the surface of his designs. While form does not actually move, it is thought to be in a space of virtual movement and force in digital design medium (Lynn, 1998).

Just as the meaning of a sentence varies according to who says it, when it is told, why it is said, and what is the intent and the aim, topological structure also varies according to its field and time. It is not possible to think of a building independent from its context as Kwinter (2001: 14) expresses in his book "Architectures of Time;" "an element is inseparable from and in constant interface with the world of force, will, action, and history." For Lynn, the nature of the context, its characteristics and the factors in the context are representations of time in his dynamic design approach.

Accordingly, topology is the tool for constructing form's dynamic image according to Lynn. Lynn expresses movable formal expression with topology where time is recorded numerically as parameters. He constructs an architectural theoretical background for his time-based architectural approach.

5. DISCUSSION AND CONCLUSION

In the whole of the 20th century, it is seen that the concept of time has been applied in the way of expressing an architecture defined by the concepts of dynamism, form, movement and living process. For instance, at the beginning of the century, Kupka, Duchamp, and Boccioni's studies related to motion, Malevich, Lissitzky, and Van Doesburg's abstract art, and Fuller's and Van Doesburg's architecture can be given as examples where time and its dynamism and temporariness were studied (Henderson, 1983). Considering integration of the notion of time into architecture, geometry and form has importance. It was Sigfried Giedion in his "Mechanization Takes Command" and "Space, Time, and Architecture" who emphasized the new geometries as the primary



concern of the 20th-century architectural theory and design (Lynn, 1999a: 11). Non-Euclidean geometry uses of mathematicians such as Riemann, Lobachevsky and Poincaré have been applied by architects and theoreticians for achieving new expression of reality in Cubist, Futurist, Suprematist and Neoplasticist art theories. In architectural discourses, it has been advocated that new reality is a dynamic reality and thus, new architecture should also have a dynamic character. Herein the space-time continuum, which is identical to the concept of movement, gained importance (İnceköse, 2006).

Lynn is one of the architects that embraced dynamism in his design approach. Even though some theoreticians (Delalex, 2006; Jencks, 1999; Bird & LaBelle, 2010; Rocker, 2004; Kipnis, 1993) indicate that this is a form based effort, there is a theoretical thinking behind. The designs of Lynn are actually products of an integrated architectural discourse. Lynn tries to integrate variability and temporality of time into the design process for creating dynamic, growing, interacting and developing designs. Hence, rather than creation of an output; designing the process, thinking of how the form will adapt to the changing forces in the field and then grow and evolve with its shaping forces are important in Lynn's animate approach. This kind of a process based approach is also explained by Erdine and Kallegias (2017: 217) as, "this condition can reformulate the role of the architect away from getting involved with creating an end product according to rules/ parameters, towards becoming the system designer whose task is to observe the outcomes of the system as it is continuously adapted on a multitude of interdependent levels." Hence, different from the studies that focus on Lynn's form generation concerns, this study focused on the formation of Lynn's dynamic architectural design language.

In this study, Lynn's architectural design language is understood through examining his references to the concept of time. The way Lynn grounds his time-based architectural approach and relates the concept of time with his architecture are discussed and revealed. This study uncovered how Lynn grounds his form generation focused discourse based on time by clarifying the mechanisms that Lynn uses to express time in the digital environment. First mechanism is constructing an analogy between the concept of time and the dynamism/variability of the design process where architectural form is in a continuous interaction with the field forces. As well as nature is in a constant change, the design field also do not have a static character and the architecture should correspond to the dynamic character of the design field. Hence, Lynn creates an analogy between the dynamic cycle of nature and his architectural design approach. Re-conception is another mechanism that Lynn applies for indicating the change in the meaning of time. He turns the temporality of time into permanent information using numerical parameters and computational design tools. The last mechanism that Lynn uses is the metaphorical relationship. By using a metaphorical relationship between time and topology, Lynn aims to build time with topology and topology is the way of constructing the notion of time. Hence, Lynn is able to materialize the animate design process and create a time-based architecture.

It is possible to draw a parallelism between Lynn's consideration of field forces for his architectural production with Peter Eisenman's early concerns on destabilizing architecture and replacing self-referentiality with a focus on space. Eisenman (1998) looks at the relationship between solid and void, figure and ground, and structure and space and asserts that this relationship is represented within the building form. In his discourse, Eisenman refers to external factors for shaping architecture and forces the architect to deal with them (Corbo, 2016). Motion and force fields are opposed to the static and timeless character of architecture. Like in Lynn's architecture, the ground does not only frame the figure, but becomes a part of it (Eisenman, 1998).

Beyond the theoretical relations, the effect of computer technologies to Lynn's time-based architecture cannot be ignored. Lynn integrates dynamism, movement and temporariness of time in his architectural approach, using the advantages of digital technology. Computers give the ability to Lynn to deform and transform form and to think about the



design space as a dynamic space. Lynn visualizes the relation of motion with the architectural creation process in site using digital tools. He records time into the design process as numerical data using parameters, and shapes dynamic images of form as topology in his architecture using digital technology. The computational tools enable to take real-world constraints into account and enable modelling the diversity and complexity in the dynamic field. In the absence of computers, time-related studies reduced into static set of coordinates where experiential effects add the notion of time into form (Lynn, 1999b). The observer was the one who added motion to the object. Increasing embrace of technological advancements in architecture enabled designing time-based forms, which would have been impossible to dream of without digital technology. Currently, there is a shift from static objects to dynamic fields and Lynn is the one who adds motion to the object using digital software. With the integration of the forces into the architecture, form becomes a part of the site rather than a boundary that constrains motion and force flows in the site. Lynn's architectural productions are animate that live within time.

While Lynn's form creation concern can exist as a narrative independent from the concept of time, his studies are actually products of an integrated architectural discourse. He grounds his form based architectural production into a theoretical basis, which includes creating living, breathing and interacting organisms. Lynn's approach is not merely a form-focused approach. Indeed, Lynn's architectural discourse is an example of the instrumental way of thinking of architecture. Therefore, understanding Lynn's architecture requires understanding how this instrumentality is generated through the concept of time. Thus, for the discussion that aims to reveal the background thinking of time-based productions, a new perspective is proposed towards Lynn's architectural theory that focuses on time, different from the readings focused on Lynn's form based concern.

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