LANGUAGE INNOVATIONS OF CONTEMPORARY ARCHITECTURE: FROM KINETICISM TO KINETIC ARCHISCUPTURE

A B S T R A C T

This text provides a brief essay on the development and emergence of kinetic archisculpture with reference to the history of artistic practice and kinetic development through art and architecture over a period of 18th century to date. Special emphasis is given to the consideration of kinetic incidence of archisculpture objects as more and more present phenomenon of innovative language of contemporary architecture from the end of last and the beginning of this century. It also points to the long historical path of the earliest experiences of movement in art to the modern study of the kinetics value which increasingly manifests now certain interactive archisculpture of modern kinetic architectural structure .

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INTRODUCTION

The fundamental *notions of architecture* and almost every serious inquiry into the topic tend to always refer us back to history, to those inevitable elements of the entire language of architecture (movement and how much man craved it, openings, floors, ceilings, and so on) that every architect has used, everywhere and at all times through the evolution of the thousand-year old experience. One of the key parts of this basic list of essential elements of the language of architecture is *movement*, together with its properties. It has been a long journey through history from analyzing the meaning and function of the movement of man (as the main user of space), to those modern studies on the value of kinetic properties of movement that increasingly define and express the interactive archisculptural nature of the contemporary language of architecture. The richness of this basic architectural repertoire in which the phenomenon of movement, as a symbol of life, occupies perhaps the central position, even today, has obviously not been exhausted if we manage – through coordinated creativity – to focus and position the recognizable value of arts and culture in the language of contemporary architecture. Relying on this fundamental parameter of the value of kinetic movement, the emergence of archisculptures primarily defines the creativity of a future time which will, by means of the opportunities offered by new technologies, cherish and develop the beauty of expression of these phenomena in ways that are unimaginable to us. This is why artistic practice might become a unique stage upon which modern architecture, as well as the architecture of the future, will be able to tell its story in a more profound way, and where life will meet society in all its very specific needs and with newly defined determinants of meaning.

ARTISTIC PRACTICE AND ITS RELATION TO KINETICISM

Artistic practice, from the earliest days of its existence and development, has maintained and cherished acts of motion, as a dynamic and aesthetically important segment in defining artwork. Various cultural and historical circumstances contributed to developing a rich variety of parameters for *observation* and *evaluation* within the wide possibilities of art and its developmental paths. The kinetic property of movement remains something of a *meta-linguistic* element present in conceptual art, whether dealing with its removal from works of art or its introduction into them, in the field of this emerging artistic practice.

In addition to the observed relationship between artistic practice and the kinetic property of movement, it is clear that the concept of kinetic art had its own physical acknowledgement and significance in early cultures, as can be seen

in the countries of the Far East or in the influences of the ancient world which are still easily recognizable today. If we are to study the distinctive history and origin of the concept of kinetic art in relation to the experience of sculptural practice, we have to examine not just the period of the ancient civilizations, but also its early development stages within the framework of the modern European art scene. In the context of the emergence of these relationships during the 20th century, it is important to consider the first, Duchamp's mobile kinetic sculptures, which were made in now distant 1913, from which we observe that this creation may even be a more important parameter than the inception of kinetic sculpture, by which Duchamp 'discovered' *readymade*¹ art, which subsequently produced a broad impact on the entirety of contemporary art. As an introduction to the analysis of the origin and structure of the term "kinetic sculpture", we will look at the context of its influence on the development of contemporary sculpture. Even today, almost a century after Duchamp's bicycle, kinetic art remains vibrant, while its most important representatives are increasingly using open space, alongside the Dada principles of recycling and re-using old materials or objects for new purposes. Contemporary sculptural practitioners are developing this principle by introducing environmental themes including the protection of particular natural assets or animals, as well as by creating active art that identifies, provokes and creates a new natural and urban space outside the traditional boundaries of museums and galleries.

KINETIC ART AND ITS RELATION TO ARCHITECTURE

Around the 1920s, exactly this kind of contemporary kinetic sculptural plasticity started overcoming the traditional static nature of monumental sculptures in the ways that it displayed, by means of mechanical, magnetic, electrical (and, increasingly, digital) tools and cybernetic structures, a certain movement and dynamic change in the object. Since the beginning of the 1950s, kinetics has taken many different directions, which have been successfully explored by many of the artists we will examine here: the main representative of mechanical kinetics was Alexander Calder; as well as Takis who rendered the movement of magnetic fields into the visible part of a structure; Otto Piene, artist and co-founder of Group ZERO², showed the behavior patterns of floating, transparent and translucent bodies in the atmosphere; while the grotesque poetic apparatuses of Jean Tinguely deconstructed the absurdity of the machine world, by creating kinetic contraptions out of abandoned objects, whose fascinating intensity underlined their useless empty performances. Even during the first light experiments of the Russian Constructivist Naum Gabo, Pevsner and Moholy-Nagy, kinetic art was associated with scientific practices and architecture. This

paved the way for light-kinetic architecture, and specifically for the aesthetic light experiments of spatialized and plastic op-art – which explored the common specificities of artificial and natural lighting representing it as the model for kinetic apparatuses. Some of the main representatives of these optical-spatial sculptures are: Group ZERO, the Nul Group formed around the Dutch artist Nicolas Schöffer, Henk Peeters with his cybernetic light towers and Adolph Luther with his translucent light locks and focusing rooms.

Kinetic art, in a very clear and demonstrable way, incorporates, shows or reveals movement [Greek: *kīnēsis*, movement, *kinetikos*, mobile], though it is necessary to point out that not all art which includes movement may be defined as kinetic, in the sense usually conveyed by the term *kinetic art*. Since earliest times, people have been intent on representing the movement of humans, animals or natural phenomena: bird flight, charging or prancing horses, warriors fighting, running or jumping wild animals, waves, storms and so on. In fact, they tried to represent movement, or more accurately, to represent an object moving inside it, especially when the movement was seen as particularly expressive, longed after or still unattainable, such as in the case of movements that were linked to the faculty of flying, or the jump as its constituent and symbol.

Kinetic art is not concerned simply with the representation of movement within a certain form or medium in which it is expressed as such. It also deals with movement as a concept, with its essence and *latent dynamism*³, as well as with movement as a constituent of a particular work of art. The difference between the actual and the represented movement is not sufficient in itself to discriminate kinetic art from other art forms which include movement. Not all artworks that move are kinetic, nor do all kinetic works literally move.

Figure 1. The first kinetic sculpture by Marcel Duchamp (1913.) was his readymade "Bicycle Wheel". Source: <https://s-media-cache-ak0.pinimg.com/736x/bb/60/75/bb60756ae27c39d9ffa02d79bd44b335.jpg>

Figure 2. Laszlo Moholy-Nagy "Licht-Raum Modulator" Light-Space Modulator, (1930.). Source: <http://www.xn--thomasneubcker-motiondesign-kkc.de>

According to the precise meaning of the term, a product of kinetic art must also have other specific qualities in addition to movement: the movement has to produce a special effect which will be instantly noticeable. Nonetheless, it is not essential that the work moves. The effects that correspond to kinetic art may be produced by the viewers, who move in front of it or manipulate the work itself. There are cases in which neither the work nor the viewer move, and yet a kinetic effect is produced. It is important to recall, for example, that a work of *op-art*, whether considered a form of kinetic art or not, does not show movement: what it does is create the impression of actual movement; in kinetic art, therefore, real movement occurs; in *op-art* the very work appears to move; in the representation of a moving object it appears that the represented object moves. These differences are more clearly observed when we take into account the genesis of kinetic art. The 1912 Futurist *Manifesto*⁴ already contains the nucleus of the idea of kinetic art: “One must not forget that [...] the frenzy of a fly-wheel, the whirl of a propeller, all these are plastic and pictorial elements of which Futurist sculptural work must make use” (Boccioni). The 1910 Manifesto states that “the movement and light destroy the materiality of bodies”⁵. The idea of kinetic art was realized for the first time in Russia immediately after WWI, when a group of artists (Tatlin, Rodchenko, Gabo and Pevsner) started exploring the idea of simultaneity, though its clearest and strongest expression was in the “Realistic Manifesto”⁶, printed in August 1920 by Gabo and Pevsner: “We affirm in these arts a new element the kinetic rhythms as the basic forms of our perceptions of real time”⁷. What Gabo and Pevsner were referring to was a form of sculpture in which movement had the same significance as structure or space, but not a dominant position. They did not aim to replace traditional sculpture with a kind of mechanical ballet. They did not wish to renounce the essential feature of sculpture – it being a construction in space. Mobile works of kinetic art create forms in space by means of movement. It is not relevant that an actual form appears: it is enough that the moving object delineates and defines a certain area in space so that a form or an image appears as a result of its movement. The earliest work that complied with these requirements is Gabo’s “Kinetic Construction” from 1920; it consists of a vibrating metal tube driven by a motor which creates simple waves. Less than a decade after it was constructed, another important work appeared – the Moholy-Nagy’s “Light Machine” (“The Light-Space-Modulator”)⁸. Although Gabo did not pay special attention to it, light effectively played an important role in producing the sculptural effects of “Kinetic Construction”, because the light reflecting off its metal surface created the impression of solidity. Moholy-Nagy on the other hand was fully aware of this fact. Light was important not only for the metal parts of the machine; it added a new “sculptural” element by including the surroundings

in the work itself. The notion of a sculptural use of light and environmental art was one of the most prolific ones in kinetic art and is the one most widely used today. Moholy-Nagy's contribution was also important at the theoretical level. In the Manifesto he published in 1922 with Alfred Kemeny, he discusses the impact of kinetic art on the observer. While up until then the viewer had passively accepted the work of art, now s/he became an active participant with control of his/her faculties. In kinetic art, the composition is not presented all at once. The observers construct it for themselves. This position of Moholy-Nagy anticipated one of the most topical achievements of contemporary art – the participation of the viewing audience.

Kinetic art as we know it today originates with Alexander Calder rather than with Gabo or Moholy-Nagy. Calder solved the issue of the driving force in the simplest and most elegant way, by using the movement of wind (natural elements). For this reason, he did not need to hide the power source or to try and incorporate it in the work itself. In the early 1930s, he started creating works he named *mobiles*, made of thin metal "plate-like" shapes, in black and white or in primary colours red, yellow, blue (Mondrian colors, while the metal plates recall the playful spirit of Miro's "mobiles"). Calder had long been the only artist who consistently worked with kinetic sculptures. He was considered an eccentric; after all, according to the preconceptions of the times, kinetic sculpture was neither painting nor sculpture. It was not considered serious enough, almost as if it was a plaything. However, starting from World War Two, and particularly since the 1950s, kinetic art has increasingly attracted the attention of serious artists.

If we see kinetic art as a contemporary movement in the visual arts which is based on the mechanical or accidental movement of the work of art, or on the impression of its movement, then kinetic art has achieved a specific synthesis which became mutable by the introduction of the variable of time – a work that had been static now became dynamic. Notions related to modernism – such as technical mutability and the aestheticization of the world – were more or less literally translated in the artistic aesthetics. "The history of kinetic art should not be traced only in the ideas of the avant-gardes, but also in certain earlier aesthetics: back to the 18th century, in the "luminism" of Louis Bertrand Castel's light organ, or Alexander Scriabin's *Gesamtkunstwerks* from the early 20th century⁹, in which he tries to integrate light, sound and theatre, using a light piano which connected certain sound structures with parts of the visible light spectrum."¹⁰

THE HISTORY OF KINETICISM, KINETIC SCULPTURE AND ARCHISCUPTURE

In order to better understand the history of kineticism, kinetic sculpture and archisculpture, first, we need to see the concept formation of movement and the appearance of kineticism itself. According to the earliest known definition of kineticism, attributed to Franz Cizek¹¹ (born in the Czech Republic in 1865), the term is derived from the Greek words *kinesis* and *kinein* (movement, to move) and denotes that direction in art which represents a sequence of movements resolved and analyzed through their rhythmic elements. Cizek and his disciples aimed to thematize the driving forces of modern discourse, the *movens* of our existence, and, more generally, the energy flows of life as a manifestation of this. Conceptually, such a goal was not a new one. Since the postulation on the conservation of power by the physicist and physiologist Hermann von Helmholtz¹² in 1847, the German-speaking world had been increasingly debating issues of energy, transmission and the creation of power. Between 1890 and 1920, attempts were made to introduce rhythm into art theory, as the driving force of artistic creativity. The idea of rhythm determining form remains valid and applies to all art, regardless of whether it relates to creating physical space, stanzas in a verse, plays or musical pieces. Even set designers and playwrights have drawn inspiration from a number of artistic concepts that seek limitation to basic shapes, colors and essential patterns of movement. This idea was in direct correlation with the experiments conducted at the Bauhaus in Weimar and Dessau. Within these, it is especially important to mention Oscar Schlemmer and his highly creative work on the development of costumes with specific kinetic properties¹³. The artistic practice of conceptualizing the idea of the living space of a building, when it comes to architecture, can clearly be seen in light of his sculptural kinetic installations-costumes, which are inhabited by people who are its users. Schlemmer's 1916 studies on costumes (which become *living machines*)¹⁴ clearly constitute an architectural sculptural language that was already readable at that time, and is still applicable today in the spirit of the increasingly relevant contemporary kinetic archisculptures.

In the spirit of Schlemmer's research, it is important to note the work of the prominent Croatian academic Andrija Mutnjaković, who offers a unique example of a creative and visionary approach through his engagement with kineticism in architecture, notably in terms of the development of self-sustaining housing as a kind of "machines for living"¹⁵. His Domobila project of 1964 is significant as a matrix for many later solutions which can be observed in the work on modern bridge building of Santiago Calatrava and his followers. Of his work, Mutnjaković stated in the early 1950s: "Why does architectural

design typically wear itself out on statically treated constructions (columns, beams, wall), and systematically exclude the kinetic properties of the machine (movement, mutability, control)?”¹⁶

This issue is one we can clearly address, at least in terms of the increasing relevance of *responsive and interactive*¹⁷ kinetic architecture of the present, which is almost guaranteed to be important in the future. Significant, too, is his conception of energy efficiency and ecology as part of the development process of kinetic architecture, stating both the terms of energy aesthetics and energy architecture; however, his work in the field of Domobile is essentially characterized by kinetic and mechanical properties that anticipate and develop a clearly defined relationship with bionic principles, according to the experience of artistic practice. Knowing this, we can conclude that his work is recognizable as some of the earliest to involve kinetic ideas of archisculpture, particularly in terms of the Balkans, where there are very few other examples of this practice.

After a significant historical break, this idea once again started resonating in contemporary architecture and sculpture by the end of the 20th and the beginning of the 21st century. Properties of latent dynamism and the kineticism of the represented archisculptural forms which have dominantly shaped the most important works of this period have strengthened the need for the introduction of the term Kinetic Archisculpture. This term classifies and adequately directs our experience of the visual properties and polysemous processes established by various works of contemporary archisculptural praxis. In order to better understand this term, it is necessary to give an overview of the concepts and process of contemporary kinetic sculptural praxis.

Figure 3. Santiago Calatrava, Valencia: City of Arts and Sciences (1998), Hemispheric by night.
Source: <http://www.flickr.com/photos/capreoara/7857043364>

The history of contemporary kinetic sculpture must necessarily refer to the metamechanical sculptures of the Swiss Dadaist Jean Tinguely¹⁸, who in the mid-1940s incorporates motors into his sculptures, experimenting with movement, rhythm and their effects. Tinguely refused to accept the cyclical and predictable movement of his sculptures, so he constructed his installations using non-linear mechanisms which make some of his so-called *self-destroying sculptures* unpredictable because of the ways in which their detonation occurred. The direction that the machine would adopt also depended on the circumstance of its activation.

All this often made Tinguely's sculptures unpredictable, and one of the best known ones – *Homage to New York* – became notorious precisely because of the fact that it did not explode when expected, which initiated its repurposing as a performance and a form of art which also functions outside of its kinetic properties. This had a particular influence on the direction of future archisculptures and their development in mixed-media, from static and kinetic towards dynamic, unpredictable, and even virtual forms of archisculpture.

Arthur Ganson¹⁹, who was often compared to Beckett, worked on moving (kinetic) sculptures for more than 25 years, and his oeuvre has a similar metaphysical aspect to Jansen's and Pisaturo's, though in an entirely theoretical sense. He does not try to create a new race or robots which will produce art. Some of his moving machines exist only to lubricate themselves with oil, while others, in spite of the complexity of their mechanisms, have absolutely no function at all. Ganson, both an engineer and a choreographer, uses the roughest and the most delicate materials: from the most finely-drawn wires to rougher blocks of concrete and steel. Some of his sculptures are powered by electrical motors, but most of them have been designed in such a way that they are moved by those spectators who chose to do so. Unlike many of his contemporaries, Ganson does not resort to technological advancements – his art is completely devoid of computer aid, complicated software, lasers or solar sensors, and his sculptures are referred to as *retrotechnological*. Ganson is known also for his interest in *Rube Goldberg* machines²⁰ – extremely over-engineered and often cumbersome contraptions, with a great number of mechanisms which indirectly achieve a very simple end task. These contraptions are named after the famous American illustrator who first started drawing them, though he never made them himself. Goldberg believed that every task could be accomplished in two ways – using either a simple or a more complicated method, and that a surprisingly high number of people would inexplicably resort to the more difficult approach. His illustrations feature contraptions assembled from dozens of handles, wheels,

cups, balls, ladles, parrot cages, boots, toys and similar objects, which create the minor effect of closing a window or squeezing one orange.

Another important author in this context is Theo Jansen²¹. Set apart by an extraordinary sculptural conceptuality, he is recognizable both as the creator of the future and a man drawing his ideas from the earliest times. He creates incredible works of kinetic archisculptural practice which incorporate inklings of correctly perceived symbols of nature, its pulsations, impulses and rhythms. Jansen's bionic designs result in sculptural beings of large dimensions, surreally moving in empty areas (e.g. beaches) thanks to the wind. Not only do the kinetic sculptures of his later oeuvre move, but they are also able to avoid obstacles, and even protect themselves by hiding inside loose material or sand if they sense the onset of adverse weather conditions. Such sculptural artistic practices may be considered particularly important for the potential development of the climatically interactive kinetic and dynamic values of the archisculptural forms of the future. For this reason and due to the dimensions of sculptures and the possibility of people inhabiting them, it is necessary to mention a part of Jansen's research which focuses on machine animals: one of them, intended for transportation, called *Animaris Rhinoceros Transport*, despite weighing 2t, can be activated with little effort by one person alone, while the cockpit can house up to four people. The work was sublimated and expanded in content in Jansen's latest effort *Mammoth*, a 12-ton residential monster whose insides contain several rooms, and which opens up the possibility of a new concept of dwelling. Jansen hopes that his virtual sculptural race would one day be provided with pneumatic nerves, muscles, the sense of touch, and an at least rudimentary decision making capacity, while his ultimate goal is to leave his work to live autonomously on the beach. Unlike Jansen, who does not resort to contemporary technological achievements in his art, Carl Pisaturo²¹ started out with robotics, integrating it with the ideas of kinetic sculpture. His robots have the most bizarre functions, which are often so complex in practice that the artist, for the time being, makes do with imperfect prototypes. However, Pisaturo is a sculptor, not an engineer, because his robots are not intended for serialized production: Pisaturo imagines a human scale robot with a fluidity of movement, who could roll over, fall and continuously turn in space, akin to a dancer moving in a zero gravity field.

In the given descriptions and analysis of individual artists, it is possible to see that contemporary kinetic sculpture clearly implements almost all the existing and applicable technological means and media of the modern day. The structure of possibilities that these technologies allow shows that their application in

contemporary architecture is becoming more and more necessary. If we take into account the need for the actualization of the visual and dynamic property through which contemporary architecture expresses itself in its language and practices, the context of the aforementioned issue becomes clearer. The properties of kinetic sculpture represent some of the strongest visual and dynamic features expressing the forms of human creativity. It is precisely for this reason that it is important to identify the ways in which its increasingly relevant sculptural practices can be applied in contemporary archisculptures.

THE BEGINNINGS AND HISTORY OF THE DEVELOPMENT OF ARCHISCUPTURE

The very phenomenon of the formation of archisculptures, their impact and development can be seen through the numerous edifices which were constructed after the Guggenheim Bilbao Museum, confirming the increasingly more visible presence of *archisculpture*²³ and its advent in the language of contemporary architecture – Jean Nouvel's Torre Agbar and Herzog & de Meuron's Forum building in Barcelona, or Zaha Hadid's Phaeno Science Centre in Wolfsburg, Germany, which is defined by the undulating cone forms of Futurist buildings. They recall the developed sculpture of Henry Moore, Jacques Lipchitz, or even Eduardo Chillida. Vast areas of creativity which today's architects can use thanks to the most recent technological innovations allow them to shape their buildings and suggest through these shapes that architecture as a whole has become a recognizable continuation of the history of sculpture in the form of archisculptural constructions. The well-thought out installations of the Eduardo Chillida, when compared to the model buildings of internationally renowned architects such as Steven Holl and Herzog & de Meuron, show just how important the paradigmatic function of modern sculpture is in today's conceptualization of space and in computer or even cybernetic -animated design.

This surprising development of contemporary architectural form and its language must not lead us to forget that archisculptures also existed at an earlier stage, i.e. that this contemporary phenomenon follows the long tradition of the interplay between architecture and sculpture. From the geometric perfection and expressive simplicity of the Egyptian pyramids, through the Constructivist aesthetics of the Eiffel Tower and the classic sculptural aesthetics of the Statue of Liberty, the close connection between architecture and sculpture became particularly significant in the 18th century, and continued from that time on so as to become one of the most interesting features of Modernism. Modernist sculpture, since its inception circa 1900, has absorbed the key impulses of the

history of architecture: the figures of Aristide Maillol reveal the strong influence of Classicism, while the Gothic style strongly marked the works of Rodin and almost all the works of Russian Constructivism. “Architecture is sculpture” was the statement of one of the greatest sculptors of all times, Constantin Brancusi²⁴, who defined the increasingly more probable, today even perhaps certain, direction of its development.

The clear distinction about sculpture dealing with “the shaping of bodies” and architecture with “the shaping of spaces” had become untenable by as early as 1910. (August Schmarsow)²⁵. In text about well-known world exhibition (for the Guggenheim Bilbao, October 28, 2005 – February 19, 2006) entitled *Archisculpture*, Markus Bruderlin quoted that Architecture become increasingly more plastic and physically oriented, while sculpture made stronger claims for dissolving the containment of the body, starting to open towards spaces. Sculpture became more constructive, establishing links with the geometric designs of the International Style represented in the work of architects such as Mies van der Rohe and Vantongerloo. At the same time, architecture grew to be more sculptural. Rudolf Steiner and Erich Mendelsohn defined the close connection between *anthropomorphous* architecture²⁶ and figurative sculpture, leaving some questions open until today, including the Blob architecture of Greg Lynn and Lars Spuybroek. Their soft, organic biomorphic expressiveness tried to create a dialogue between Expressionist and Rationalistic architecture, by contrasting the geometric modernism of Le Corbusier and Mies van der Rohe. These oppositions have survived to the present day, as seen in the debate between Box and Blob. The contrasts between a geometric one and an organic approach to designing forms, and between space and body are one of the leitmotifs in the definitions of the notion that is the subject of this text.²⁶

Figure 4. Theo Jansen Animaris Rhinoceros Transport (2005).
Source: <https://i.ytimg.com/vi/MYGJ9jrpbvg/maxresdefault.jpg>

In the middle of the last century, architecture turned into sculpture and sculpture into architecture. This is confirmed by the work of Le Corbusier and Frank Lloyd Wright, who introduced the so-called *sculptural style*²⁸ into the history of architecture, while almost at the same time Eduardo Chillida managed to open the body of the sculpture inside the space of architecture, by laying the foundations for a new chapter of sculptural architecture in the 1960s. Sculpture defined its historical method and position within architectural practices, on the long journey from the monument to the contemporary kinetic installation. For this reason, it is especially important to mention in this context the work of Alberto Giacometti. “Equally revolutionary were Alberto Giacometti’s experiments with the pedestal and his concept of the plaza, with which he launched a major expansion in the 1950s. Giacometti is considered the father of installation art, a form of expression that conquers space, penetrating the urban space and even, with Joseph Beuys²⁹, attempting to transform the social body into social sculpture.”³⁰

The end of the 20th century brought about completely new technological possibilities of juxtaposing and connecting architecture and sculpture. Blobmeister architecture³¹ has further strengthened the relationship between sculpture and architecture, bringing it to a higher level and opening it to new topics.

In her statement that “I feel that architecture more and more absorbs and sometimes even ‘devours’ sculpture”³¹, Rosalind Krauss opens up the field of interpretation of the future history of sculpture. There is no better example of the admonishing strength of these words than the Guggenheim Museum Bilbao by Frank O. Gehry, constructed in 1997. This architectural supersculpture indeed appears to be devouring everything that surrounds it. Given the creativity and the opportunity of using advanced technologies, perhaps contemporary architecture may indeed be considered the real continuation of the history of sculpture, expressed in a new language of giving dimensions to form and its movement.

KINETIC ARCHISCUPTURES

Kinetic archisculptures and their features can be seen through the formation of contemporary archisculptures which almost completely erase all conceivable boundaries between the two disciplines – architecture and sculpture, which were actually never really separate, given their common medium of form, and, increasingly, also, the concept which they represent and through which they are re-established. Archisculptures have clearly shown that form is essential

and sometimes even more important than function, which had previously been considered the starting point in the determining priorities of architectural practice. In relation to form and its latent dynamic properties, modern architectural practice has started to represent form itself as the matrix for the development and establishment of the functional properties of certain objects. At a time when speed is triumphant, when Carl Honoré writes “*In Praise of Slow*”³³, the minimalism of the architecture of Santiago Calatrava highlights the special importance of the kinetic archisculptural properties of contemporary architecture. Just like Calatrava, who has included them in most of his works for almost two decades, Frank Gehry with his new mobile archisculptural forms, unambiguously reveals the future directions of this increasingly more important aesthetic and artistic property of the language of contemporary architecture. Compared to the materialized objects (Gehry’s Guggenheim Museum), form and its representation through sketches or drawings shows that there is no limitation that present-day materials cannot overcome, and this simulacrum of the feasibility of the function in the pre-determined form of a certain object has provided fertile terrain for the creation and development of archisculptures. As such, in their evolution they have quite naturally entered the domain of the kinetic properties of sculptural practice, giving birth to a clearly identifiable and irreplaceable concept of *Kinetic Archisculptures*.

The properties which allow for a certain object to be described as kinetic archisculpture entail all the features of kinetic sculpture, either as a reference in the materialization of the object itself or as the consideration of all the dynamic and kinetic properties which the object possesses in both the aesthetic and functional sense.

Most of the currently available technologies offer a wide spectrum of possibilities, which usually determine the kinetic and dynamic expression of the archisculptural features of facades, but which does not mean that in the near future we should not expect that whole parts of buildings may achieve new kinetic fields of action in their relationships with the complexity of form of the architectural object they belong to. It is important to note that, in a sculptural object, archisculpturality occurs when, during its creation, a space appears that is seen to belong to it, a space whose dimensions are enough to include people in the processes and functions which are have been defined by the very concepts of these sculptures. In addition, it is necessary to emphasize that archisculpturality in architecture can also occur when an architectural object (either in the process of its formation or in its later visual representation and realization) predominantly and distinctively integrates and reveals the values of sculptural artistic practice.

The design of specific architectural works includes the concept of movement as an integral part of the formal and spatial legibility of the object itself; some bridges and public buildings (such as those of Calatrava)³⁴ are, in the process of their opening, converted into kinetic sculptures whose open silhouettes highlight the newly-created structures of the space. By these and other similar processes in which movement is activated as a visual factor, an architectural object reveals all its constitutional values of kinetic archisculpture. As such, it represents an authentic manifestation of future archisculpture, which will possess kinetic features almost as a rule, both in the mechanical definition of its movements and the virtual properties of new technologies, which will increasingly convert architectural facades into variable visual displays in innovative 3D technology. The analysis of movement as a vital part of the creative oeuvres of some of the biggest names in contemporary architecture shows that their works reveal that architecture is capable of incorporating movement, resulting in an astonishing performance of the movement of mass which does not necessarily need to be static. Their work constantly questions the boundaries of the presence of movement in architecture, clearing the space for the interpretation of the values and the concept of *kinetic archisculptures*.

CONCLUSION

If we consider the symbol and the ontological idea of movement as one of the necessary factors for the definition of a work of art, then we can also say with certainty that the architectural work of the future, by its positioning in space and time, will be considered and developed according to the dynamism of movement, both through its constructive elements and its aesthetic and use values. Expanding on Heidegger's idea of being and the time which defines it, it is possible to reflect on the language of architecture through the architectural creations of the future, envisioned as works of increasingly more complex artistic expression which already in their conception integrate movement as a dynamic and kinetic property of life.

The aesthetics of an architectural work as a whole cannot be pinned down to one specific and knowable characteristic of its individual, aesthetically-shaped parts. It is almost always a combination, a harmony of lived experiences, which every work of architecture activates and preserves during its existence. For this reason, if we define a work of art in time on the basis of the reactions and possibilities of its appraisal, the method of determining the nature and extent of the necessary characteristics of a work of art is necessarily a complex one. The being of an architectural work, just like a person's, individuates itself by finding,

in the context of its material existence, an environment which either assimilates or accentuates it. This never-ending game of the possible relationships and variability of forms of an architectural object reveals an important factor of our experience and understanding of the aesthetics of architectural work – like any work of art, it is more and more associated with *movement*, as an increasingly essential determinant and the source of its visual and aesthetic development. Precisely such a development implies the existence of a paradigm for all further possibilities within artistic praxis, fostering the power of the language of contemporary architectural creativity in those aspects which inclines it both towards art and towards the function of human existence inside it. This is why only the truly great works of architecture find a way of reconciling the finite and the infinite in terms of time, two concepts which greatly determine the aesthetics and meaning of architecture seen as a work of art. Materialized architecture, as a work of art, best illustrates the integral experience of the world of a certain society, in accordance with the elements of reality with which it interacts.

The relationship with the physical, social, cultural and other realities of the site in which and for which an architectural project is designed, is one of the major points of discussion in the context of the debate on the future of the language of contemporary architecture. Some of the most important research on the psychology of perception, when applied in the field of architecture as a profession, can establish even today that the observed architectural space and the dynamics of its forms are registered in human memory with the passage of time. It is quite likely that this fact could be further developed into a cognitive process which will be extensively used by the future language of the theory of architecture in the field of architectural practice.³⁵

The modern technology available today should not be understood as a goal, but as a means to foster the creative potential of the environment, which will satisfy not only the essential but also the cultural and aesthetic needs common to almost all human beings. Despite the almost unlimited possibilities that are already being realized, these technological resources should be used in a way that preserves core values. This does not actualize the question of whether modern building and settlement designs should reconstruct the language of the past. The diversity and associative potential between contemporary and past works is considered on the basis of the similarity of individual experiences and the sensations they produce, which directed the efforts of past creators, and which will certainly continue to direct every future culture and tradition. In this context, an effort should be made to derive certain universal rules which will allow the freedom of consideration of the physical and social contexts of the language of

contemporary architecture.³⁶ Kinetic archisculptures seem to generate in their facilities and projects a general spiritual experience common to past and present generations of men, despite the different cultures they come from.

The identification of these universal rules calls for Jung's view on creativity and creative acts: "The one who speaks in primordial images speaks in a thousand of voices, he reaches for the unrepeatable and the transient, he overpowers and at the same time raises in the sphere of the personal what he intends to signify, he elevates personal destiny to the level of the destiny of mankind and by doing so he frees in all of us the positive forces which had gradually enabled mankind to save itself from all danger and to overcome even the longest of nights... this is the secret of artistic action."³⁷

Discussing globally the topic of the future of architecture, twelve thousand members of the American Institute of Architects have sent the following message to the world: "The most we know about the future is that it pressures us and that it will push us towards *coordinated creativity*".³⁸ We could conclude that the key word for the future of knowledge and the development of the language of architecture will be "coordinated creativity," which is explained and established through the necessary promotion of the artistic and scientific components of the language of architecture, in order to better put it at the service of a humane society and hence man as its essential part. Coordinated creativity also puts forward the question of introducing and applying new terms in the language of contemporary architecture, which would best describe its development paradigms, in order to be able to study the issues of coordinated creativity and strengthen its position as a strategically chosen value of future architecture and the art of a new age. Thanks to the development of new technologies, the eclectics of the dynamically resolved forms has received its kinetic properties, expressed in the fusion and symbiosis of polyvalent approaches to the new rhythm of contemporary sculptural practice, which seems to find precisely in archisculpturality the key to the modern conception of successful creation and design.

Even in today's society, most things transform before our eyes, becoming something else, and therefore we ourselves have to change. This is very convincingly reflected in our behavior and experience. Sensations can no longer be easily molded or categorized. The changes in society and technologies also influence the boundaries of our perception of life. In this context, we should not forget that we ourselves change precisely with what we experience, and therefore we must constantly notice that almost all values of architectural and artistic works are transferred to the important organizational and existential

structures of our being. The power of the multivalent (polysemous) architectural language of today's global culture, which arises from the possibilities of engaging the creative forces of future viewers and users of its contemporary manifestations, is an important parameter that clearly indicates the advantages of the kinetic archisculptural form (in the process of designing and sublimation of coordinated creativity). If science and technology are experienced only as a support to artistic aspects and the lyricism of the language of contemporary architecture, and if our technical performance and technologies do not become the end goal but an already successfully applied tool which help create more poetic objects, *kinetic archisculpturality* will become the new aesthetic value of the future development factors of interactive architectural form. The true nature of the variability of form, and consequently of the symbols of motion as well, have shaped the global tendency which is oriented towards trying to create and explain architectural works which (through phenomenological constituents – kinetic features inherent in their archisculptural forms) show the increasing importance and potential of their inclusion in the contemporary and hyper-productive urban fabrics. The artistic events that can potentially occur in these kinetic archisculptures are unfathomable. They exist as accumulators of conscious intuitions which we use to awaken and sublimate our inner experiences. Hopefully, the coming period will adequately enhance and use their creative potential. The setting, in terms of time and space, is unquestionably offered by the major and most influential urban surroundings, such as Paris, London, New York, Tokyo, Moscow, and so on. Their development designs show that the historical centers of cities will be preserved in the best way possible in the language of traditional architecture, while on its margins new urban fabrics of the future will continue to grow. They will become stirred-up valleys with no flat surfaces which will contain a diversity of effects, inconceivable without the notion of *archi-technological metamorphosis*³⁹. The force of the virtuality of the term will dynamically and kinetically interpret the forms of future architecture through the values and functions of their motions and the symbolic-semantic characteristics of their meaning. The vivid images of the future will prevail over all of our current imaginations, creating a strong and rich content of public space, where the only place of solitude for the future user will be found within the virtual choices through which he will consume the simulacrum of reality in accordance with his desires. Imagine streets where you will be automatically log in, receiving from each individual advertisement the tailored image of the product adapted to your attitudes, desires and inclinations. The colour palette, forms, sounds and movements will be visible only to the viewer, and in the way that best complies with his desires. Life in such urban environments will become the application of the future which will, in the framework of our own

predispositions, make us look at the real surroundings through somebody else's eyes and commercially defined creative solutions.

Therefore the advancements in the development of the language of contemporary architecture should not be seen only in the expansion of its boundaries, but also in their better understanding. Present and future generations of architects are facing a vast array of opportunities for change in the articulation of the core values of motion in the plethora of artistic practices used for the development of the urban and aesthetic values of architecture, which are already present and clearly recognizable in kinetic archisculptures. As already present elements of the new era, they announce a new stage of urban life which will be as taken aback by the static forms of the architecture of the past as we would be today faced with the omnipresent and interactive kinetic archisculptures of the future.

NOTES

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ATMOSFERSKE DIMENZIJE ARHITEKTURE

Andela Karabašević

U ovom radu predlažem četiri metodološka alata za naučno istraživanje arhitektonske atmosfere: objektivno iskustvo, holistička mera, kompjuterska simulacija i atmosferska vizualizacija. Ovi alati su proistekli iz šireg istraživačkog opsega zasnovanog na hipotezi da efemerni efekti – svetlosti, toplote, zvuka, mirisa - koji se manifestuju u vazduhu ili kroz vazduh, predstavljaju naučnu osnovu za precizno konstruisanje atmosfere u arhitekturi. Opisivanjem sopstvene istraživačke metodologije na primerima individualnih studija slučaja, braniću stav da se arhitektonska atmosfera može naučno istražiti i tačno konstruisati, i da atmosferski pristup arhitektonskom istraživanju i projektovanju nudi novo neprocenjivo saznanje o nevidljivim vazдушnim procesima koji određuju čovekov osnovni doživljaj prostora.

KLJUČNE REČI: ARHITEKTONSKA ATMOSFERA, ATMOSFERSKA METODOLOGIJA, OBJEKTIVNO ISKUSTVO, HOLISTIČKA MERA, KOMPJUTERSKA SIMULACIJA, ATMOSFERSKA VIZUALIZACIJA

KOSMOPOLITSKI PRIRUČNIK ZA DEKOLONIJALIZOVANU AFRIKU - TROPSKA ARHITEKTURA U SUVIM I VLAŽNIM ZONAMA PREMA FRIJU I DRUOVOJ

Jacopo Galli

Edvin Maksvel Fri (Edwin Maxwell Fry) i Džejn Dru (Jane Drew), iako su poznati po svojoj ulozi u izgradnji Čandigara zajedno sa Le Korbizjeom, njihovom indijanskom iskustvu prethodila je duga karijera u Zapadnoj Africi koja je započeta tokom Drugog svetskog rata i trajala je do kraja 50-ih godina. Fri i Druova bili su aktivni u Gani i Nigeriji u izgradnji velikog broja objekata: škola, univerziteta, kuća, sela, poslovnih zgrada i muzeja. Njihovo iskustvo na terenu pretočeno je u knjigu *Tropska arhitektura u suvim i vlažnim zonama* (Tropical Architecture in the Dry and Humid Zones) konačno objavljenu 1964. godine. Ovaj rad ima za cilj da analizira njihovo uputstvo kao pokušaj da se uspostavi kosmopolitski i savremeni sistem za projektovanje specifičan za tropske predele. Eksperimentalni i naučni pristup koji je klimatskim podacima pronašao alat za stvaranje nove zasnovanosti moderne arhitekture ne oslanja se na analizu kulture ili reinterpretaciju vernakularnog, već na složenu analizu lokalnih uslova kako bi se došlo do odgovarajućih projektantskih rešenja. *Tropska arhitektura u suvim i vlažnim zonama* predstavlja manifest regionalnog modernizma, dva naizgled suprotna koncepta koja su pomirena u projektantskom pristupu kojim se pokušava izgraditi nova kosmopolitska modernost.

KLJUČNE REČI: FRI&DRU, TROPSKA ARHITEKTURA, GANA, NIGERIJA, AFRIKA, KLIMATSKI ZASNOVANO PROJEKTOVANJE, KOSMOPOLITIZAM

OD KINETIZMA DO KINETIČKE ARHISKULPTURE

Nikola Marković

Ovaj tekst predstavlja kratak esej o razvoju i nastanku kinetičkih arhiskulptura uz osvrt na istorijat refleksija umetničke prakse i razvoja kinetizma kroz umetnost i arhitekturu (u periodu od XVIII veka do danas). Poseban akcenat dat je sagledavanju kinetičkih pojavnosti arhiskulpturalnih objekata kao sve prisutnijih pojava inovativnog jezika savremene arhitekture sa kraja prošlog i početka ovog veka. Rad takođe ukazuje i na dug istorijski put od najranijih iskustava pokreta u umetnosti do sadašnjeg proučavanja vrednosti kinetizma i arhiskulptoralnosti na polju razvoja savremene interaktivne kinetičke arhitekture.

KLJUČNE REČI: KINETIZAM, KINETIČKA SKULPTURA, ARHISKULPTURA, KINETIČKA ARHISKULPTURA I UMETNIČKA PRAKSA