

The animated soul of the machine
The development of kinetic elements in installation art,
eastern and western positions

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ABSTRACT

Machines and robotic structures are questioning existential bases of human beings. They influence our way of thinking and transform our social philosophies and value systems. The same time they keep their fascination ever since. Mechanical technique and skills are symbols for development and hazard at the same time. The attraction of this ambivalence is reviewed in this thesis by having a look at kinetic elements in modern sculpture. The author is focusing on classical sculptural positions that use machines or machinery within sculptural artworks. The historical development is examined and certain examples from the classical modern era are discussed as role models during their time. On this scenario, the portraits of two young contemporary outstanding positions in the field of kinetic art and installation are analyzed and explained. One of the goals was to investigate the eastern and the western language of two artists that are doing artworks in the same field and compare the works and the cultural expressions to each other. Different cultural positions and visual languages become visible due to the research. And the author's final conclusions is, that even in a globalized world there will always be significant local distinguishes remaining.

Key Word: Kinetics, movement, perspective, animation, installation, sculpture, soul

I . Introduction: The animated soul of the machine

The meaning of animation is derived from the Latin verb “animare” , which means bringing to live, giving spirit or soul.¹⁾ Exactly this context will be the research bases of the thesis, trying to investigate how modern artist give soul to their works by the means of machines or the use of complex apparatus as strategies of artist in the modern era of art until now.

The visual phenomenon of the movement was an existential question in terms of the perception for the human being. For our ancestors the perception of the movement was important for their survivals. Hunters have to be sensitive for the slightest movement in their surroundings. Their sensitivity was an existential question. But also in our times hunting information and ideas, visual and intellectual sensitivity could become a crucial point someday. In the fine arts as we know it nowadays the use of the movement was restricted to more or less physically moving installations such as fountains, flags and wind games. With the development in the sixties of the understanding of the terminus “art” the understanding of the idea of “kinetic” appears.²⁾ After that the physical movement was interpreted rather in units of quality then in the physical understanding of quantity.

Independent from the arts the attraction of the machine and the soul of the machine have been from the beginning of

* This research was supported by the Chung-Ang University Research Scholarship Grants in 2016

1) Oxford dictionary: Late Middle English: from the verb animare, from anima ‘life, soul’ .

2) Battcock, Gregory *Minimal art : A critical Anthology* (1995) p.182

human being a main topic in the cultural context. Before mankind developed its skills in the use of tools actually animals also had the ability of using tools to find solutions for problems that were not solvable by hands or normal physical strength only. The human species started to combine the skills of using tools with research and created inventions to build new materials and forms. Through these combinations finally it found a way to build more and more complex machineries. That is actually the starting point where the origin of kinetic art as I want to discuss it in this thesis starts.

II. Historical development of machines and movement in cultural context

1. The Antikythera mechanism

When I started to develop this thesis one initial question for me was: What is the oldest complex computer-like machinery that we know nowadays? During my research I found several historical samples and one of them, the Antikythera mechanism belongs to the oldest analog computers on earth whose physical existence is proved. After the recovery in 1901 and the following reconstruction and profound researches they dated it back to 150-100 BC. Perceptive mathematics and complex construction capabilities led to the result of this mechanism enabling it to follow the movements of the moon and the sun, to predict eclipses and model irregular orbits of the moon.³⁾ In such a case the

3) https://en.wikipedia.org/wiki/Antikythera_mechanism (River

spirit of the machine is not aiming to touch artistic level, but nevertheless the construction itself seems to approach miraculous skills.



Figure 1. *Antikythera Mechanism*

2. The artist and the engineer

During Renaissance in the era of Leonardo Da Vinci (1452 - 1519) the understanding of culture and art created a unique closeness between science and art. Leonardo was famous for his multitalented spirit ranging from painting, architecture, music, mathematics to astronomy and engineering.⁴⁾ This universal genius created countless designs of machines and constructions that can be observed in his Codexes and manuscripts, a collection of drawings and writings that consists of single notes and notebooks and were afterwards gathered and put together by collectors all over the world. Some inspiring samples are in the Codex Forster about perpetual motions. The Perpetuum Mobile is a

Charles, Editors C.)

4) Galluzzi, P.; *Leonardo da Vinci, Engineer and Architect*, Fine Arts, Montreal Museum (1987)

counterpart of the machines which we can see nowadays in art installations. The perpetual motion machine gets its spiritual strength by the endless motion. The drawings embody a spirit that tells in an absolute convincing speech about the technical details of the machineries, although they will practically never work. But Leonardo also designed functioning apparatus that could not be realized by this time due to technical difficulties and innocence, but they were also credentials for the soul in the machine as it was seen by artist decades before our presence.⁵⁾ The two most extensive documents are the Codex Atlanticus that is represented in the Pinacoteca Ambrosiana, Milano and the second one is the Codex Leicester, part of the private collection of Bill Gates.⁶⁾

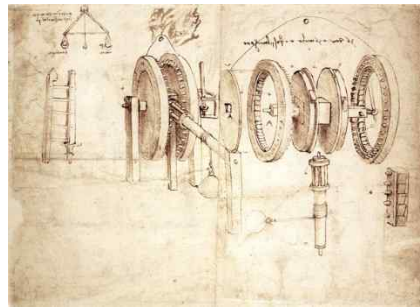


Figure 2. Leonardo Da Vinci, *drawing from the Codex Atlanticus*

3. The ghost in the machine

This part should describe the philosophical background

5) Zoellner, Frank, Nathan J. *Leonardo Da Vinci, 1452-1519: The Graphic Work* (2011) p.33

6) https://en.wikipedia.org/wiki/Leonardo_da_Vinci

of society and machine that took influence on the way we are thinking nowadays about kinetic and art.

There is a spiritual part of the machine, which keep philosophers thinking on this question. If we talk about the spirituality of machines we have to take a slight view on the term “mind-body dualism” that was set up by Rene Descartes (1596-1650). In his idea the human body works like a machine, in a way like of materialistic systems that follows the rules of the law of nature and on the other hand there is the soul, hence the spiritual side that doesn't follow this rules. “I think, therefore I am” is his most well known statement and in context of machineries and robots although nowadays in the age of artificial intelligence these statement seems not to be very up to date. In the days of AI and MI this discourse went up to a new level of argumentations. Still it is interesting to see the long-term development of this philosophical issue starting with Ramon Llull (1232-1315) as a pioneer of computation theory,⁷⁾ who influenced later Gottfried Leibniz (1646-1716) and his mechanical calculators.⁸⁾

Based on critical doctrine towards Descartes the British Philosopher Gilbert Ryle (1900-1976) wrote a book with the title “The Concept of Mind” , where for the first time the expression “the ghost in the machine” appeared.⁹⁾ In this book he critically arguments a new way of thinking about “Descartes' Myth” as a misunderstanding of categories,

7) Bonner, A. The Art and Logic of Ramon Llull: A User's Guide (2007)

8) https://en.wikipedia.org/wiki/Mechanical_calculator

9) Ryle, Gilbert The Concept of Mind. London, Hutchinson' s University Library (1949) ChapterII.

presuming that they belong to different logical types.

Following on this Arthur Koestler (1905–1983) wrote a book with the title: *The Ghost in the Machine* in 1967. In this book he dealt with Gilbert Ryle's idea of the ghost in the machine, focusing on the mankind's character and tendency towards self-destruction, especially in the field of nuclear arms. In his theory the brain is developed on archaically behavior patterns, that are overwritten during our cultural development, but they can be triggered again and even overpower higher logical functions. So the final output could be destructive impulses like anger and fear.

III. Classic modern positions of kinetics in fine art

To complete the understanding of the kinetic art in our presence I want to quote some examples of the classic modern era.

1. The first wave

To define a forerunner in the race of the first kinetic artist in the modern classic isn't easy, but one of the most influential characters is surely Marcel Duchamps (1887–1968). With his artworks the "Rotary Glass Plate" (1920), the "Rotary Demisphere" (1925) and the "Rotorelief" (1935) he prepared and directed the mind of the upcoming artists in the direction of kinetic arts.¹⁰⁾ Duchamp also had several cooperation with Man Ray (1890–1976), which

10) Battcock, Gregory *Minimal Art: A Critical Anthology*.(1995)
p.354

additionally strengthened the influence of these artists.

Some of the fundamental mental bases for the kinetic art were also constructed by the approach of the Russian constructivism around artists like Vladimir Tatlin (1885-1953) and this movement had his origin in the “Vkhutemas” the Russian state art and technical school founded by Lenin in 1920 in Moscow.¹¹⁾

Laszlo Moholy-Nagy (1895-1946), Naum Gabo (1890-1977) and the Bauhaus made further efforts to ensure that the positive attitude towards technique and machinery also ends up in a line which represents this feeling in their modern society.¹²⁾

The well known and worldwide respected artwork of Alexander Calder (1898-1976) stands somehow for the popular dawn of the kinetic artworks in the classic modern era, his charming childish approach stands forms a new tolerance and understanding in modern art. His contemporary Marcel Duchamp coined the expression “mobiles” and helped this way to open this artistic attitude to surrender the critics and academic resentments towards the movement.¹³⁾ Calder expresses in his artwork the new understanding of sculpture that creates by its movements and lightness a childish but the same time radical position of modern sculpture. This ambivalence position helped to popularize his artwork through wide range of art lovers up to the critics,

11) Margolin, V. *The Struggle for Utopia: Rodchenko, Lissitzky, Moholy-Nagy, 1917-1946*, (1997) University of Chicago Press, p.124

12) Borchardt-Hume, A. *Albers and Moholy-Nagy: From the Bauhaus to the New World*, (2007) Yale University Press p.95

13) Kuenzli, R. E.; Naumann, F. M. *Marcel Duchamp: Artist of the Century*, (1991) MIT Press p.119

attracted by the sympathetic manifestation of this new position as kinetic art.

2. Breaking columns

George Rickey (1907-2002), educated as a painter, is another one of the famous representatives of kinetic art. His work is based on a traditional understanding of sculpture as 3 dimensional structures, but they were extended with 4th dimension by including the element of movement. Still this motion is not an autonomous movement like later developed by contemporary artist as Jeppe Hein. The sculptures move independently by the energy of wind similar to the poetic mobiles of Alexander Calder, but their approach is much more sculptural, using the classical terms of size and volume, based on the manifestations of constructivism. This can be studied in his book "Constructivism: Origins and Evolution" .¹⁴⁾

The artist had several participations at the documenta in Kassel (documenta 3,4,6) and due to his intension to make big volumes moveable, he was one of the predecessor in using aluminum as an artistic material in a wide range. His sophisticated and complicated technical approach prepared a visual understanding that is familiar with positions of many contemporary artists.¹⁵⁾

14) Rickey, G. *Constructivism: Origins and Evolution*, G. Braziller (1995) p.78

15) *Two rectangles, vertical gyratory up*, stainless steel, 3.5x8.2x12.2m, (1987)



Figure 3. Georg Rickey, Two Turning Vertical Rectangles

3. Self-destruction

Jean Tinguely (1925-1991) was using, before starting his career as an artist, wire figures as show window decorations, that was somehow similar to the language of Calder and became later a part of his visual language in his installations. But in Tinguely's work there is big different to Calder's oeuvre. While Calder remains still in the narrative and sculptural space, Tinguely moves forward to existential question. On behalf of Jean Tinguely's works there should be two influential persons mentioned for the understanding of his artistic position. One is Gustav Metzger with his "Manifest of auto destructive art" .¹⁶⁾ The other one is Umberto Boccioni with his "Manifesto of Futurist Sculpture" .¹⁷⁾ Both of them don't make a claim to

16) Metzger, Gustav *Auto-destructive Art: Demonstration* (1961) South Bank London

17) Chipp, H.; Selz, P.; Taylor, J. *Theories of Modern Art: A Source Book by Artists and Critics*, (1984) University of California Press

be the basement of the art work concept, but there is an obvious connection. Within the power of destruction and transience in his work the kinetic art grew to a new horizon.¹⁸⁾ His artwork was not so much about beauty of the movement as a physical phenomenon, but much more a witness of the destructive character of machinery, the power and its fascination of ending up in self-destructing machines and aggregates that reflect the dualism of the good and the evil in one character. This way Tinguely is pointing to unstoppable process of time and mortality. In 1960 he installed a gigantic machine in the garden of the Museum of Modern Art in New York, which was able to self-destruct itself. A new understanding of durability of sculpture was coined.¹⁹⁾

4. Zero Group

The Zero group was loose international group of artist' s in the 60th that try to give an alternative answer for art toward Abstract Expressionism, aiming to avoid emotional colorful gestures, and individual expressions. Within the Zero group in Germany, led by the artists Heinz Mack (1931-), Otto Piene (1928-2014) and Guenther Uecker (1930-), the research of the movement is broadening the understanding of kinetics in several direction.

Heinz Mack was one of the leading pioneers in researching the possibilities of light and kinetic

18) Popper, F. *Origins and development of kinetic art*. New York Graphic Society, 1968.p.131

19) Schavemaker, Til and Wismer *Tinguely META-MATIC*, (2016) Verlag der Buchhandlung Walter Koenig, Koeln

structures. He represented Germany in the German pavilion in Venice 1970 and took part multiple time at the Documenta in Kassel. From 1960 on he was working on rotors and “Lichtmuehlen”²⁰⁾, kinetic objects that use light and movement to encounter the exhibition space and create a spatial installation form. Still this was somehow an esthetic approach referring to the classical understanding of installation art.

Gunter Uecker used the attractive moment of kinetic within several examples like “the sand mill“(1968) exhibited first time in the Guggenheim Museum in New York. The art work is a circular shaped installation, where a long wooden bar, in the center fixed on a slowly turning motor is endlessly engraving circles in sand. The infinite motion speaks about the non-visible that reaches perceptible level in the existence. His aim is to understand the works in its universal kinetic context, “which makes him feel happy”^{.21)} He stays rather on a spiritual level than using the expressive power of movement.

Otto Piene was entering as the first Fellow to the MIT Center for Advanced Visual Studies (CAVS), founded by György Kepes.²²⁾ From 1974–1993 he was director of the CAVS at the Massachusetts Institute of Technology. So he was a key figure that linked the scientific field with the art. In that sense his way of understanding kinetic is unique, combining scientific understanding with the freedom of art.

Within the Zero group there were different positions of

20) English translation: *light mill*

21) Interview with Guenter Uecker about his work.
https://youtu.be/omTBdbXo_dc

22) <http://act.mit.edu/collections/cavs/history/>

kinetic art, from the light and space related installations of Heinz Mack, the social and symbolist metaphors of Guenter Ucker to the scientific related installation of Otto Piene. They were all influencing the kinetic understanding that we share nowadays.

IV. Contemporary Western and Eastern Positions

For me as a researcher based in Korea, but origin in the western art world, it was an interesting question how far there could be differences between the eastern and western art worlds. So I picked from both sides two outstanding contemporary artist to observe their positions.

1. Choe U-Ram (1970-)

Choe U-Ram was educated as a sculptor in Korea and after his graduation he started to learn programming and controller techniques in a firm. His work is based on his personal interest in robots and machinery since his childhood. From early age on he was interested and fascinated by the machinery of robots. He was fascinated by the automatism of the machinery. This childish curiosity was later transformed to serious research and development of complex machineries.²³⁾ This is documented various times with his drawings of a robot as a kid.²⁴⁾ The motivation from his childhood should lead him to his actual works. He was interested in creating autonomous organism that communicates

23) Personal Interview in September 2017

24) Catalog of Choe U-ram, Taiwan, 2017, Robot drawing

and interacts between each other. Though the autonomy is restricted due to energy dependency of electricity, the decision of powering on the machinery is still on the side of a person who is in charge of the artwork. But as soon as the power switch is triggered the organism is deflating its own “anima” that is finally an independent self-deciding process.

In 2002 he started his series of works that simulate living organism, not that far that they were independent living organism structure, but somehow mimicking the structures of live and creating a soul for the works. All these works are named additionally with Latin titles, and also escorted with narrative framework that seems to be based on scientific research.

1) Ultima Mudfox

The “Ultima Mudfox” was one of his first artworks that founded his approach of uniting scientific content and storytelling writings in a field where rumors and fairy tale are shared.

Choe U-Ram founded a research unit that is called: U.R.A.M. (United Research of Animated Machines) as a part of its story-telling framework. So he is constructing a spider net of science based strings, where the viewer is caught by the seemingly truth of the sciences. In this work he used sensors to activate the motion of the body mimicking a species that looks and moves like a fish, but is said to be able to move in mud. There starts a point where the reality and fiction all of a sudden breaks apart. The motion is like a quote of the scientific truth, proofing the existence of

the Ultima Mudfox.²⁵⁾ He gave him also the scientific name “Anmoropral Delphinus delphis Uram” .



Figure 4. Choe U-ram, *Ultima Mudfox*

2) Una Lumino Callidus-Spiritus

The Jet Hiatus from 2004 is another sample of his apparatus that represents a conception of an organism. The scientific name is Anmorosta Cetorhinus maximus Uram.²⁶⁾ Also in this concept he is wrapping the soul of the machineries in a narrative skin, so it pretends a scientific background, but due to the content as an obviously untrue story.

25) Ultima Mudfox, metallic material, 65(h) x 150(w) x 55(d)cm, (2002)

26) Jet Hiatus, acrylic, machinery, synthetic resins, acrylic paint, electronic, Dimensions: 88(h) x 222(w) x 85(d)cm, (2004)



Figure 5. Choe U-ram, *Jet Hiatus*

“First observed at an airplane scrap site in the Mojave Desert, Jet Hiatus is presumably regarded as an inorganic creature that mutated from the microscopic machine found in a gas turbine engine. It is remarkably similar to the engine of a passenger plane in form.”²⁷⁾ This phrase is an excerpt of his homepage explaining his scientific contexts of the organism.

3) *Ala Aureus*

The *Una Lumino Callidus-Spiritus* is an example where Choe U-ram thematises the communication of machines underneath each other, which look like an accumulation of glowing blossoms,²⁸⁾ The flowers open and close slowly, also the light emission is dependent on the information that plants exchange with each other.

27) Copied from <http://www.uram.net/> as an explanation for his lyric strategy

28) *Una Lumino Callidus-Spiritus*, metallic material, machinery, electronic device (CPU board, motor, LED), polycarbonate, 776(w) x 263(h) x 43(d)cm. (2016)



Figure 6. Choe U-ram, *Una Lumino Callidus-Spiritus*

In his work *Ala Aureus* he also uses these interactive combination to create a federation of machines, which are communicating with each other. ²⁹⁾ They change their appearances controlled by small micro motors and within its organic shape the sculpture seems to be a living tree creature.



Figure 7. Choe U-Ram, *Ala Aureus*

When we watch these examples we can see to which extent the kinetic sculpture gives up the simple minded characters of moving machineries in favor of algorithms that decide

29) *Ala Aureus*, metallic material, resin, machinery, electronic device (CPU board, motor, LED)
460(w) x 190(d) x 330(h)cm, (2017)

about the action of the sculptures. The movement gets closer to a thinking process as to the physical movement. Hence the sculpture are getting closer to spiritual objects than physically moving plastic art.

1. Jeppe Hein (1974-)

1) On the trail

Jeppe Heins work touches the unspeakable link between technical miracles and visual sensations. In his work "on the trail" he plays with the feelings of constant instability and danger, combined with the physical miracle of balancing a mirrored stainless steel ball on a long white powder coated aluminum bar. In this instability the viewer find himself reflected on the steel ball as the main actor in this unpredictable drama. But like a heavenly miracle the ball always find it way on the thin white path. Attracted by the sensation und the eager to understand this miracle the viewer gets closer and closer to himself, waiting for the ball to fall down all of a sudden. But that never happens, even more the ball continues its instable journey on the other end of the bar. In his work the technical background and the mechanic stays hidden, that fact creates an even higher attraction of the mechanical structure. His attitude gets close to the art of a magician, who performs his hocus pocus. But without braking the spell of his visual message, he leaves the observer in tension field of uncertainty and knowledge. Unlike other artists, where the technical part is obvious and visible, he leaves a secret that creates its own attraction.³⁰⁾



Figure 8. Jeppe Hein, *On the trail*

2) Spinning Ball 50

Unlike to “on the trail” the next work is not that sensational in the first view, but it actually plays with the second view. The kinetic motion of the work is almost disappearing, hidden but present, only the viewer who gets closer can perceive this kind of fast spinning ball.³¹⁾



Figure 9. Jeppe Hein, *Spinning ball*

3) Invisible Moving Wall

30) *On the trail*, Material: high polished stainless steel ball, powder coated aluminum bar, motor, spindle drive wooden trestle, dimensions: ball: \varnothing 30 cm; Pedestal: 115 x 250 x 75 cm, (2008)

31) *Spinning Ball 50*, material: high polished stainless steel ball, motor, accumulators, magnet, white plate, dimensions: ball: \varnothing 50 cm, pedestal 80 x 80 x 2 cm, (2008)

The third artwork of Jeppe Hein is called invisible moving wall. The title itself is somehow goes without saying. It consists of one or more freestanding walls mover very, very slowly between the walls of the exhibition space. The visitor may not notice the motion of the work due to the slow speed of maximum 10cm per hour. It is a play with the perception of the audience and questioning spatial qualities.³²⁾

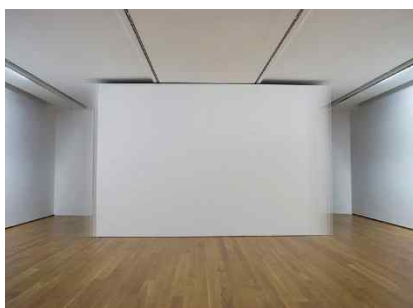


Figure 10. Jeppe Hein, Invisible moving wall

Jeppe Heins art work seems to be a kinetic game and it also plays with the spectator. He invites for a mind game which nobody can win, it is a discovery of our own perception. But not in terms of visual perception rather in terms of conceptual perception.

V. Conclusion

When we observe the development of kinetic artworks, we

32) *Invisible Moving Wall*, materials: plywood, iron, wheels, electrical motors, technical apparatus, dimensions variable, (2001)

can testify that the works use more and more internal structures, which means they abandon the surface (the obvious and visible movements) and tend to be more sophisticated in sense of philosophical questions and conception approaches. It seems to become more spiritual than the material orientated precursors. Somehow we cannot generalize this conclusion on other existing examples, but during researching these cases, there were obvious characteristics inside the artworks which differ in its philosophical positions. E.g. in Choi Urams work the visual context tends to be much more in the foreground compared to Jeppe Heins work. That could indicate the favorite strategies in eastern and western approaches. Therefor the rationalism seems to be closer to the western style. But as I said it is difficult and also not my intention to generalize. Also we have to accept that the timeline of developments in the western and eastern cultures are not synchronous. The Modernism which the Western society knows started much earlier than Modernism in Asia. Also the timelines inner Asian regions are very different. While the technical development was pushed urgently, the philosophical settings leapt partly behind. But one of the most impressing characteristics of the Asian culture shows, that as soon as new basements are set, the restructuring and development is much faster than in the western hemisphere. When we refer to the given kinetic arts sample we can conclude, that while the eastern positions are rather spiritually based in terms of using the motion as a metaphor of life structure, the westerns part is much more based on rational and instinctual motives. In our times of global development the surfaces seems to become more and more similar. But as soon as we

question the deep soul in the center of the artwork, there are still characteristic differences. The distinctions in my opinion are not connected to “blood and soil” as many politicians like to pretend. It is rather a regional power, the soul of the local society that are still much differing from each other, and also will stay in future due to the rule: one location cannot be exactly identical to another physically different location. So following this discourse there could be an even more interesting question: whether souls (the spiritual basement) can be transferred from A to B without changing their essence of their philosophy.

As the final conclusion and prediction we can see the art follows the scientific and social tendency of specializations, so does the kinetic art works. They get more and more close to sophisticated and refined areas. But still they are somehow bound to the site where they grow, interact with the society and create their own unique blossoms.

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국문초록

기계의 움직임은 정서에 대한 조형 연구

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기계나 로봇은 인류의 실존적인 기반에 질문을 던진다. 기계들은 인간의 사고방식에 영향을 주었으며, 사회철학과 가치체계가 지 변화시켜왔다. 이와 동시에 기계들은 줄곧 다양하고, 매력적인 특징들을 함유해왔다. 기계기술의 발전은 인류의 발전이라는 상징적 의미와 동시에 인간 존재를 위협하는 위험성이라는 상징적 의미를 함께 가지고 있다. 이러한 기계의 양가적인 특징들을 현대 조각의 키네틱 요소에서도 발견할 수 있다. 필자는 조각적인 작품 중에서도 기계나 기계의 메커니즘을 활용하는 조각에 초점을 맞추었다. 이를 역사적인 발전과정을 통해 검토하였으며, 현대미술의 특정 예시들을 당대의 대표 모델로 논하였다. 본 연구는 키네틱 아트와 설치미술 분야에서 두각을 나타내는 두 명의 젊은 동시대 작가인, 최우람(Choe u-ram)과 예페 하인(Jeppe Hein)을 대표 모델로 선정하였다. 두 작가는 기계나 기계의 메커니즘을 사용하는 동양과 서양의 작가로서, 두 작가의 표현방식의 차이가 존재한다. 예시로 몇 가지 작품을 제시하고, 비교를 통하여 두 작가의 문화적 차이와 시각 언어의 차이가 나타나는 이유에 대하여 분석하였으며, 이를 바탕으로 글로벌화된 세계에서도 지역적 특징이 항상 남아있음을 결론으로 제시한다.

주제어: 키네틱, 움직임, 관점, 애니메이션, 설치, 조각, 영혼

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논문투고일 : 2017.10.31.

심사종료일 : 2017.11.26.

게재확정일 : 2017.11.26.