

Mechanical Life: Expression of Artificial Life Shown in Kinetic Art

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Abstract

The use of various media as well as development of technique led to much attention to artistic expression of artificial life. In particular, development of motor to which high technique is applied, application of sensor which plays a role like a human sensory system as well as research on new type of system to which object is combined that reacts to external environment contribute to artistic creation. In addition, application of characteristics that lives have enabled classification as mechanical life unlike simple mechanical system. Existing kinetic art produced artworks considering only movement as important concept. However, application of research which simulates process of life by using computer or other media helped express mechanical life. This study analyzes kinetic artworks which were created based on theories on artificial life. This study covers artistic value of artificial life in kinetic art by making mechanical life that can expand communication with spectators.

Keywords: kinetic art, interaction, artificial life, mechanical life, concept of life

1 Introduction

Kinetic art which expresses art based on movement of artwork originated from Marcel Duchamp who used wheel of bicycle in his artwork. Thereafter Alexander Calder created free drawing in space by using mobile and expressed variation of visual perception by simple and repetitive movement [9].

Technological development helped analyze and apply characteristics that lives have. For example, hereditary algorithm was applied to computer which enabled computer to have its own capability or to react to external environment based on sensor or physical system. Such expression appears similar to interaction which is simulated in concept of life which is considered application of perceptual ability to moving machine. Perceptual ability is based on external environment or judgment. Kinetic art contributes to aesthetic appreciation of artistic value along with technological development based on system which is similar to life. Such artistic activity led to mechanical life which deserves being studied continuously along with development of related field.

2 Artificial life art

Christopher Langton imagined life and advocated research on new system to reproduce life and founded a term called artificial life.[7] Research of reproduction of life gained a foothold by technological development.[8] Such technique is applied to art. Michell White classified artificial life art into four areas as follows. The first is artwork which is cultivated in a computer. The second is artwork which interacts with external environment. The third is artwork which moves on its own in actual space. The fourth is artwork which produces abstract image [9]. Aforementioned four areas are classified in results after technique is combined in artificial expression about life. The four areas regard realization of reproduction of live through technological supplementation as meaningful [1].

3 Cases of related artworks

Study analyzes realization of reproduction of life by selecting artworks to which concept of life was applied among artworks of kinetic art. Theo Jansen produced strandbeest series. Theo Jansen produced machines which move under influence of natural elements. Strandbeest series which were produced by Theo Jansen were installed along the beach. Strandbeest series have joints made of plastic pipe and vinyl and power system which uses wind.



Figure 1. Animaris currens ventosa, Theo Jansen, 1944

Animaris currens ventosa which is shown in [Figure 1] was produced in 1994 which is subject to wind power with two wings which are located in upper side. Theo Jansen has produced a number of strandbeest artworks. Theo Jansen used reaction to wind and water to create organisms that live on the beach. Theo Jansen gave a role which grows wild in actual space to reproduce lives.

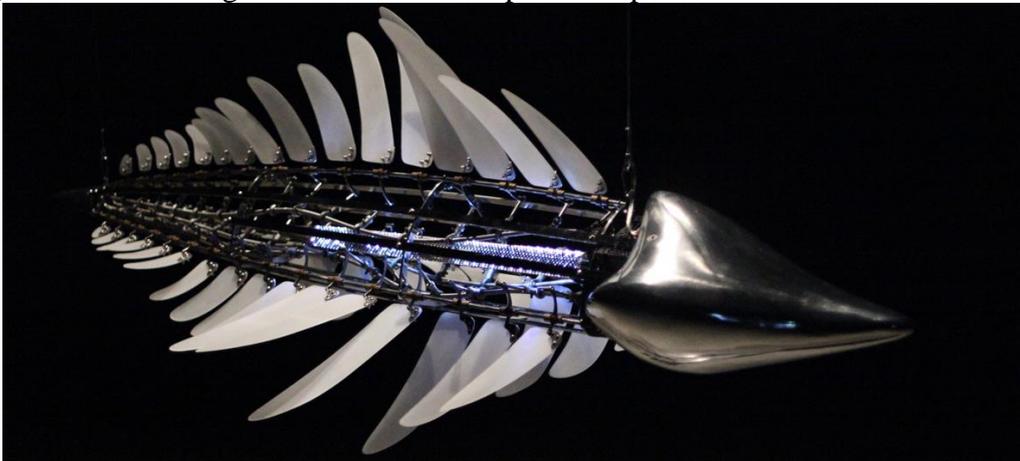


Figure 2. Ultima Mudfox, Uram Choi, 2002

[Figure 2] is ultima mudfox which was produced by Uram Choi in 2002. Ultima mudfox has been researched by many scientists after it was shot by accident in subway construction site. Materials of ultima mudfox are metal, acrylic and electronic device. Size of ultima mudfox is 160(h) x 350(w) x 160(d)cm. Uram

Choi continued to make a story which is related to lives in his various artworks. His artworks have their own movements. He realized reproduction of lives by making movement of artworks similar to movements of lives. [10]



Figure 3. Hylozoic, Philip Beesley and Rob Gorbet, 2007

[Figure 3] is hylozoic which was produced by Philip Beesley and Rob Gorbet in 2007. Hylozoic has transparent acrylic tile. Hylozoic shows movement that plants in water has which covers the whole exhibition space. Hylozoic reproduces lives of plants which humans feel in the woods which contributes to communicate with the whole life system.

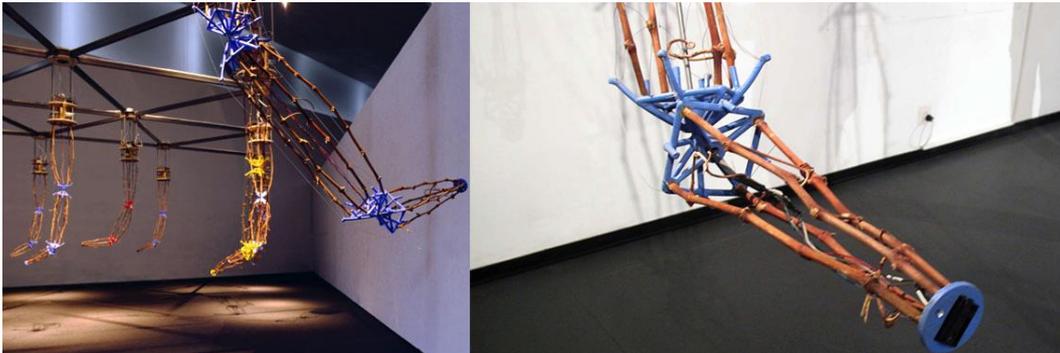


Figure 4. Autopoiesis, Kenneth Rinaldo, 2000

[Figure 4] is autopoiesis which was produced by Kenneth Rinaldo in 2000. Autopoiesis has 15 sound robot arm pieces which hang on the ceiling and 4

infrared sensors detect spectators. Autopoiesis has controllers which are separate each other but detects living activities of the whole system by interaction. Autopoiesis detects movements of each object and spectator and react to them with movement and sound.

4 Production of artworks and research

FUG which was produced based on reproduction of lives is mechanical life which lives in actual space and reacts by spectators that are external environment. FUG moves by sound of spectators which is energy source. FUG reproduces lives with movement of plants as motif and emits light at the same time. FUG emits light energy and kinetic energy at once expressing perception of spectators visually. Organic algorithm was applied in release of energy as part of plants. In FUG, the fact that light and sound play an important role in ecology was considered. Energy influences a change in individual being directly. System of creation and extinction in environmental change was formed. Energy which is applied by spectators gives feedback to spectators leading to experience of changed energy.

FUG's Hardware is composed of parts that have shape of microphone and speaker. FUG's appearance looks like lotus. Stamen of lotus was expanded excessively to show effusion of energy and light emits which plays as expression of energy. FUG's materials are aluminium, stainless steel and PVC. This artwork has colorful pink which makes spectators on alert. There are five LEDs and microphones in the edge of stamen which is used to store sound. Stored sound is reproduced as new musical element after undergoing programming and drives motor which moves petals at the same time. Motor is installed on 10 outer covers which is equipped with speaker. Speaker does not reproduce sound and plays as visual element along with LED. FUG usually remains open and closes when there is sound which is beyond certain volume. Stored sound is reconstructed with background music and reproduced after it is interpreted musically. Reproduced sound is composed in accordance with beat of stored sound. Spectators' voice creates rhythm at random. Project mapping around such mechanical life shows release of energy through image. In FUG, media were used in reinterpreting the nature and new concept of life was applied.

Spectators input their sound into stamen of artwork which conveys feedback to spectators with LED, sound and movement. There is live flickering of LED. LED emits strong energy through interaction with spectators which makes spectators on alert. At the same time, spectators' sound is mixed and output by programming which FUG processed on its own [11].

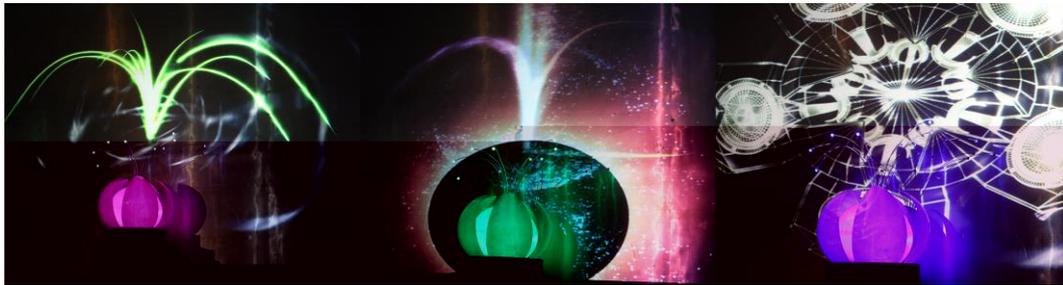


Figure 5. FUG_Showcase, Dongjo Kim, 2011

In FUG, concept of life which exists in the imagination of artist is actualized and expressed through reproduction with the help of technique. Technique which was used to give movement to the artwork can exist as if it has life independently. As research on artificial life with regard to art makes progress, approach toward life in art also advances. Combination of high tech and mechanical life led to convergence not opposition. Combination of high tech and mechanical life is used to supplement vitality which lacks in machines. Sensory organs which play as path of energy that is characteristics in organisms are associated with production of circuits. The artist makes artwork as energy flow of life beyond production of controllable media. For example, there are birth of artificial life which imitates natural ecology and structural and visual imitation of organisms. Virtual organism evolve themselves by interaction based on interruption of spectators and beings with creativity and autonomy repeating creation and evolution with possibility of organic connection to communication to humans. Spectators in virtual environment learn to contact artificially evolved technique communicating with new created organisms.

5 Conclusion

Kinetic art evolves gradually. Kinetic art considers concept of life very important. Since the first kinetic artwork was produced, technique continued to make progress and concept of life was applied to kinetic art. Artworks shown in actual space enhance immersion of spectators. Four areas in artificial life art are shown in today's kinetic artworks clearly. Energy from spectators gives vitality to artwork. Analysis of artworks reveal that characteristics of artificial life were applied in kinetic art and movement of objet aims to reproduce movement of actual life and kinetic artworks were produced with motif of life process or phenomena which are shown in organisms. This study proposed development direction of mechanical life by examining essential phenomena of organisms. This study revealed that overall activities of organisms ranging from creation of organism to evolution and extinction of organism are the result of reproduction as

mechanical life. This study realized reproduction of life by producing and researching FUG that is mechanical life and expanded concept of life into creation of ecology of virtual space. Energy from spectators and interaction of vitality of artwork enabled communication. This study found out that interaction with spectators evolve with artwork's own capability. Ecological symbiosis with humans which development of technique presented led to establishment of new relations at various levels. This study expects that production of mechanical life will lead to continuous research on artificial life art.

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Received: August 16, 2014