

The development trend of new media Art and Its relationship with technology

1. Introduction

In the 1960s, with the development of mass TV networks, electronic media and computer technology, new media art emerged in the Europe and America. But what exactly is new media? And what is new media art? (Lev Manovich raised the same question in the <new Media from Borges to HTML¹>). Is it new media art to touch an object and then make a sound? Is that new media art all about sound, light and electrics? From the beginning of the industrial revolution, the great change in human cognition of nature opens a Pandora's box for art creation. The material and media on which the artist's creation relied also went towards the future full of unknown possibilities.

And then, the most influential art form in the world, new media arts, which are derived from the most convincing medium, image, electronic and digital technology, has already spread like a wildfire. The trend is to subvert the public cognition of traditional art creation. Maybe, nowadays, medium plays a more and more important role in our daily lives, which cannot be easily ignored any more.

2. Definition and background

2.1 The birth of new media art

When new media art is mentioned, the conception of »new media« should be explained firstly.

»The translation of all existing media into numerical data accessible for computers. The result is new media: Graphics, moving images, sounds, shapes, spaces and text which become computable, i.e. simply another set of computer data.«²

New media art is based on new media and refers to artworks created with new media technologies, including digital art, computer graphics, computer animation, virtual art, Internet art, interactive art video games, computer robotics, 3D printing, cyborg art and art as biotechnology³. Every Technical achievement in human history has brought

¹ <New Media from Borges to HTML> Introduction to The New Media Reader, Lev Manovich, edited by Noah Wardrip-Fruin and Nick Montfort, The MIT Press, 2003.

² <The language of New Media> Lev Manovich, The MIT Press 2001,44/ 11

³ https://en.wikipedia.org/wiki/New_media_art

about a great change in art. Before computer technology really comes into the public's view, TV sets have penetrated into all aspects of social life. At the same time, a group of video artists like NamJune Paik cut a figure. »Hallo, elephant«(1) is one of NamJune Paik's Buddha series artworks. From his works, it is obvious that the new media has had a tremendous impact on life、culture、religion and art at that time. Whether artists want to criticize new media through works or spread a new mode of thinking, it is undeniable that new media and new media technologies are becoming to be an important way for artists to create.



1 Hallo, elephant



2. Oscillon7 (Ben F. Laposky)

Later, when the first computer »ENIAC« was invented in 1946 USA, which represents the advent of information's age, creating the condition for the further development of new media arts, especially database arts.

Then, America scientist and artist Ben F. Laposky started his first try in »digital art« and created a black-white computer graphic work named Oscillon(2), which was the first computer artistic work in the world. Behind his »digital art« work, there is somehow both improvisation and inevitability, which is the beauty of integration between science and arts. Ben F. Laposky used a cathode ray oscilloscope and other electronic circuits to create the abstract art, without specific creative intention, and the track of the motion could be very different time after time. After that, various artistic creations and attempts to take use of new media and new technologies have sprung up, from graphic design、sound art、video art to sculpture、installation. New media art has begun to spread to various art design fields.

2.2 Background

2.2.1 The influence of Postmodernism

At the beginning of 20th century, “less is more” was regarded as the standard of good design and modernism, which emphasizes that the function above all was occupying the mainstream of design and art field. Then people began to get bored with the icy industrial design, claiming that “less is bored”, and called for humanity and diversity. In the mid to late 20th century, Postmodernism developed across philosophy、arts、architecture, and criticism and that marked a departure from modernism.⁴ A group of rebel artists appeared, like Marcel Duchamp. Duchamp’s urinal artwork »Fountain« questions the boundary of art, making people reconsider art and artworks with a brand new perspective.

»The creative act is not performed by the artist alone; the spectator brings the work in contact with external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act.«⁵

Postmodernism tries to challenge the limit of modernism and show a tolerance and recognition of diversity, such as feminism, deconstructivism, materialism and so on. These terms all emphasize that artistic appreciation and creation has no single、absolute standard、and author、audience、curator、environment are all participant elements of artworks. As a result, artistic creation and appreciation are becoming more and more diverse, which promotes the creation of new media art.

2.2.2 The development of computer technology

The development of technology is the driving force behind the new media art.

After the second industrial revolution, radio and TV were created. When the TV appeared, artists began to use TV to create. This new medium was incorporated into new creation form. After the third industrial revolution, the information age is coming. Thus Media and Message play an essential role in society. After the computer appeared, people started to explore Computer Graphics. Then, the first batch of scientific artists began to create digital art. Ken Knowlton experimented with photomosaic, using letters and logos to simulate gray scale and intensity of a photo.

⁴ <https://en.wikipedia.org/wiki/Postmodernism>

⁵ Marcel Duchamp, from Session on the Creative Act, Convention of the American Federation of Arts, Houston, April 1957.

»Statue of Liberty«(3) is one of his representative works. At that time, most digital artists are mainly scientists.

The NEW COLOSSUS (BY EDWARD LARAZUS)
 Not like the brazen giant of Greek fame,
 With conquering limbs astride from land to land; Here at
 our sea-washed sunset gates shall stand
 A mighty woman with a torch
 whose flame is the imprisoned lightning, and her
 left arm is a bust of freedom; and
 her right hand holds a patterned orb
 which tells world-wide welcome; her
 mild eyes command the airbridged harbor that twin cities frame.
 "Keep ancient lands your storied dome,
 pomp! " cries she with silent lips,
 "Give me your tired, your poor;
 Your huddled masses yearning to
 breathe free; " The wretched refuse
 of your teeming shore, send
 these to me, till out of your tempest
 to me you bring your huddled masses
 here. I too once trod your pow' rous shore
 when I came over in 1883 by American post
 Emma Lazarus, and in 1903 it was inscribed
 on a bronze plaque in the
 pedestal of the statue of Liberty,
 a gift of the French people to the
 United States, designed by Fred-
 eric-Auguste Bartholdi, using an
 iron framework by Gustave Eiffel,
 dedicated in 1886 by US President
 Grover Cleveland on Liberty (then
 Bedloe's) Island, New York Harbor.
 An effort has been made to
 make this plaque harmonize with
 its 1986 Centennial celebration
 © 1986 KEN KNOWLTON SUNNYVALE CA



3. Statue of Liberty. 1986

4. Apple Lisa's Graphic User Interface

Later, with the invention of graphic software, artists who don't have advanced program skills can also participate in digital media art. Until the rise of Apple, PC began to popular. With the maturity of graphic image and multimedia technology, the field of DTP⁶ has begun to rise. The first personal computer with graphical interface »Lisa«(4) was born. Following, a variety of professional software for images, sounds and videos, such as computer graphics、audio-visual editing、interactive technology and virtual reality programs have provided new media artists a wider creative space. Nowadays, hardware and software like processing, vvvv⁷, arduino⁸ leapmotion⁹, kinect¹⁰, VR provide new media artists a more convenient creative environment and pay more attention to creation work instead of the implement method. So, the development of computer and other technology are the precondition for new media art.

3 The development trend of new media art

3.1 The extension of human body

New media art emphasizes »the extension of human body«. As Marshall McLuhan said:

⁶ Desktop publishing

⁷ vvvv is a visual programming interface for rapid prototype and developing.

⁸ Arduino is a microcontroller board for building digital devices and interactive objects that can sense and control both physically and digitally.

⁹ Leap motion is a sensor device that supports hand and finger motions as input.

¹⁰ Kinect is a line of motion sensing input devices produced by Microsoft.

»As an extension and expeditor of the sense life, any medium at once affects the entire field of the senses.«¹¹

He considered Radio as an extension of auditory sense, TV as an extension of visual sense. The computer can be seen as an extension of human nerve center. And new media art can stimulate maximum human senses, and extend the cognitions. Gradually, new media art extends from visual sense to auditory sense and blends with each other. »Test pattern« is an example, which is made by Ryoji Ikeda, who is an Electronic musician and an artist. His work »Test pattern« is an audiovisual installation. This is a huge ground video projection. With disturbing high and low frequency sounds, some crazy light strips and particle strobe images will slide under feet. Even if it is watched through screen, a feeling of being transmitted to abyss by cold data rises in the mind. Sound and Patterns also change with visitors. When you are immersed in this scene, all senses are stimulated to communicate with the artwork and human themselves. Therefore, New media art is interactive and multi-sensory, and it differs from other traditional art forms in that it can arouse viewers' senses, and make viewers go deeper into artworks and even integrate with artworks. In the process of interaction with artworks, viewers no longer stay passively outside the work, but utilize the various senses to control and participate the works. So, viewers are somehow an important part of new media artworks.



5. test pattern 2008



6. Say Superstrings

In addition to human senses, new media artworks can even combine supersense. In Ars Electronica, Ouchhh¹² created a cognitive performance »Say Superstrings«, which visualizes the change in musicians' brain waves in real-time. Musicians wear a brain sensor, which detects the emotional transformation during the performance. Then it is interpreted into dynamic images. It seems like computer Algorithm enhance human's

¹¹ <Understanding media---Extensions of Man> Marshall McLuhan, The MIT Press, 55/25

¹² Ouchhh is independent new media art group in Istanbul.

body, transfer human senses to different forms of art. In this way, a better communication between musicians and viewers are set up.

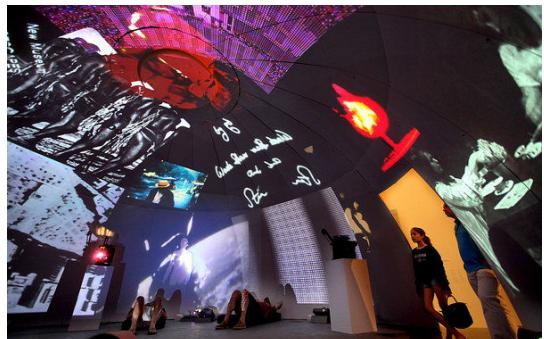
3.2 The integration of time and space

New media art emphasizes the integration of time and space. Whether sound, picture or interaction in new media artworks, an unfolding time and space is indispensable. Artists sometimes create virtual space. Two German artists Florian Ortakrass and Hannes Koch who graduated from Royal Collage of art, founded Random international studio Random International explores and thinks about the new feelings, which are brought by technology intervention in art through the sensory interaction between the viewer and the installation. The most popular work is called »rain room«(7), which creates an immersive »rain space«. It is an installation, which is built in a darkened room where rain pours from the ceiling. But when visitor walk through, the sensor will detect people and the area where visitor stands will stop raining, which offers a surreal feeling and an interaction with water. Probably, most visitors are attracted by its playfulness. However, in the place of art installation, we seem to be in another time and space, listening the prophetic teachings and the meanings behind that.

From the perspective of installation art and performance art, rain room is an “unpleasant” work, completely opposite to real space-time. It somehow limits human’s ability to feel, to feel the moment that raindrops falling on the skin, to feel the power of nature, to feel that we really live in this world. At this moment, the audiences interact with the »virtual space« through interactive sensor, and obtain the real feeling and immersive experience, which is beyond the limitation of time and space.



7. Rain Room 2012



8. Movie-Drome

New media art are time-based, which means time becomes an important part of the

work.

»Contemporary artworks that include video, film, slide, audio, or computer-based technologies are referred to as time-based media works because they have duration as a dimension and unfold to the viewer over time.«¹³

Stan VanDerBeek¹⁴ created an artwork named Movie-Drome, which can explain how new media art or time-based art integrates time and space. He built a dome-like building in the suburbs, with a stream of images, which was similar to today's 3D cinema, including the universe, humans, technology and art. In human civilization's initial stage, primitive people used stone to depict symbols and characters in caves, which was the earliest medium of humanity. In Stan's cave the flowing images seems like to convey that digital has become a new language and medium for mankind. In this space, as time goes by, viewers will also travel to the past time and space, thinking about the changes time after time.

3.3 Cultural Reflection

New media art emphasizes cultural reflection, which also means reflection and examination of human beings themselves.

»New media field is facing a danger of becoming a ghetto whose participants would be united by their fetishism of latest computer technology, rather than by any deeper conceptual, ideological or aesthetic issues«¹⁵

Cultural reflection is somehow the deeper conceptual and ideological issues. And Teamlab's artworks usually reflect this. Teamlab is a Tokyo based new media art studio, established by Toshiyuki in Tokyo in 2001. Most of the works emphasize the inspiration、future、the willing to change the world, aiming to bring people an immersing feeling with a brand new artistic expression. »Crows are chased and the Chasing Crows are destined to be chased as well , Transcending Space«¹⁶(4) is one of teamlab's works, which can resonate with people. It's an immerse environment, which is rendered in real time by a computer program. At the early beginning, crows perch on the light track, then they start to chase each other and be chased. If they

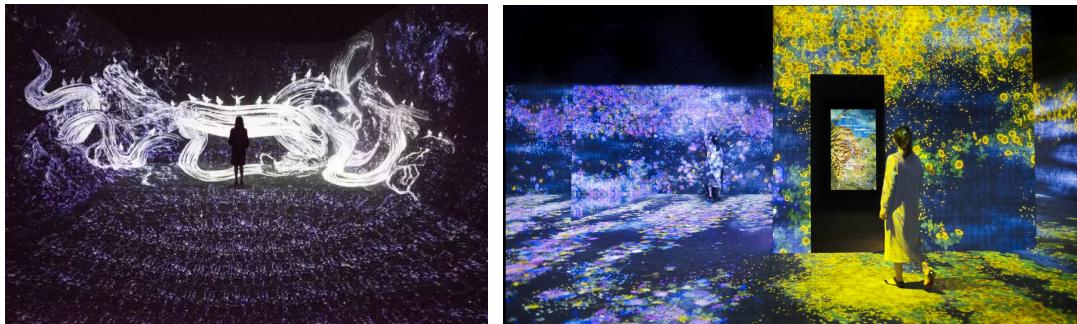
¹³ Joanna Phillips, Guggenheim Conservator,2014

¹⁴ Stan VanDerBeek(1937-1984) was an American experimental filmmaker.

¹⁵ <New Media from Borges to HTML> Introduction to The New Media Reader, Lev Manovich, edited by Noah Wardrip-Fruin and Nick Montfort, The MIT Press, 2003, 5/10

¹⁶ MORI Building DIGITAL ART MUSEUM EPSON teamLab Borderless, Odaiba, Tokyo, Japan, Jun 21, 2018 – permanent

crash into one another or into viewer, these crows will scatter into flowers. There are a thousand Hamlets in a thousand people's eyes, as long as it does touch the deepest heart. Along with the music, which created by Hideaki Takahashi, this artwork makes audiences to think about the world, the life, and the people. These crows can be considered as human beings. As a human, we were born to chase something, some people for fame、money、status, some for ideal、truth. However, it may be the time to reconsider about all the things that people are chasing for day and night, when they immerse themselves to this scene, watching out those crows and the light tracking lines. Then ask why people grasp on to things desperately? It brings a spiritual swimming and thinking, which helps people not to lose themselves, not to forget why we started, especially for people who lives in rapid-developing metropolis. Maybe it is what make new media art become one of the most meaningful art forms today.



9 Forest of Flowers and People: Lost, Immersed and Reborn

10.crows are chased and the chasing crows are destined to be chased as well

Additionally, teamlab's works inherit the philosophical thought of Japan and even Asia. »mono no aware«¹⁷ is an aesthetic trend that has existed in ancient Japan. It is not only deeply immersed in Japanese literature, but also dominates many aspects of Japanese spiritual life. So many teamlab's works also reflect this trend of aesthetics thought which is a kind of »instantaneous beauty« aesthetic consciousness, that is, admire »the shortness of beauty«. Therefore, the installations they made and the interactive visual effect as a whole are in constant change and previous states will never be repeated and can never be seen again. Similarly, in teamlab's another work »Forest of Flowers and People: Lost, Immersed and Reborn«(9), viewer can also feel »mono no awareness« philosophical concept. The flowers bud、grow、blossom、fade away, just like people's life, having season's change. Cherish every instant in life and

¹⁷ literally »the pathos of things«, a Japanese term for the awareness of impermanence, which comes from Japanese cultural scholar Motoori Norinaga's literary criticism of <The Tale of Genji>.

every instant has its own beauty.

As far as I am concerned, teamlab has successfully integrated Japanese scholar culture and philosophy into new media art and developed a unique art style. The audience was informed of the original intention of the new media art team and thinking about the world. By connecting technology and art, it may be possible to make people's lives more positive and active, and explore cultural reflection behind it. Technology is humanitarian, and digitization itself expands human's expression. With new media technology, viewers can interact with art works, which blurs the boundaries between science and art.

4. The Relationship between Technology and Art

4.1 Technology and art

During the history, art and technology are inseparable, influencing on each other. On the one hand, the development of technology offers more possibilities for art. On the other hand, it urges art to make changes. A French artist Louis Daguerre¹⁸ invented the earliest camera. And through physical optics and chemistry, humans can finally capture the fleeting time, no longer to imitate and depict the objects, liberated from »reproduction art«. Then Impressionism、Post-Impression、 Fauvism、Dadaism、Abstraction came into being. Similarly, the information technology is of most importance for the improvement of new media art.

Based on Information technology, different forms of media art and media technology have been connected. Sound artists also use laser projection technology、programing techniques、electronic music synthesis and various sensors to create interactive scenes. VR and other kinetic technique enable Graphic designers break the boundaries between disciplines and have more creation methods. Gradually, in the new media art and other art and design fields, technique was considered even more important than art and design.

Lev Manovich even pointed out that *»the computer scientists who invented these technologies- J.C Licklider, Douglas Engelbart,and others –are the important artists of our time-maybe the only artists who are truly important and who will be*

¹⁸ Louis Daguerre was a French artist and photographer, recognized for his invention of Daguerreotype process of photography.

remembered from this historical period.«¹⁹

And when technology is considered to be more important than art, artists usually start to question about the blind pursuit of high technology. Is new media art gradually integrated into new media technologies, and new media artists are also becoming technologists and even replaced by scientist? Can new media art live alone with new media technology?

The contradiction and conflict between art and technology ran through the process of the new media art's development. Originally, new media art derived from the doubt about new media's (such as TV) right of speech. After that, artists like NamJune Paik started new media art creation. During the process of new media art's development, artists pursue technique in order to support art creations. Meanwhile the problems that digital development brings to society are considered, and that cycle repeats.

4.2 Reconciliation between Technology and art

How to achieve a balance between technology and art in artistic creation? It is an eternal argument. It is undeniable that new media technology is the cornerstone of the development of new media art, but as a new media artist, it should be flexibly used instead of under its constraints, just like the relationship between artistic theory and art creation.

Peter Behrens begins to think about the relationship between art and technology during the period of functionalism. Although he emphasizes the importance of the industrial production, his works still show the unity of art and technology.

»Our most serious task, therefore, is to help technology to achieve artistic quality, at the same time helping art to great achievements though contact with technology.«²⁰
-Peter Behrens

Nowadays, Many new media art labs or institutions are beginning to explore the possibilities of integrating technology with art, rather than simply treat one as supreme, such as NTT InterCommunication Center(ICC) in Japan, ARS Electronica Center in Austria, MIT media lab in America, ZKM(Karlsruhe) in Germany,

»The task envisaged for the ZKM is the sounding out of the creative possibilities between the

¹⁹ Lev Manovich, <New Media from Borges to HTML> Introduction to The New Media Reader, edited by Noah Wardrip-Fruin and Nick Montfort, The MIT Press, 2003, 6/20

²⁰ <https://seymakcan.files.wordpress.com/2017/10/arch222presentation-week5-c59feyma-akcan.pdf>

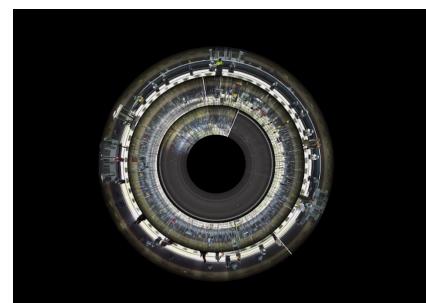
traditional arts and media technologies for the purpose of achieving innovative results. The objective is the enrichment of the arts , not their technical amputation. For this reason both traditional and media arts must compete with one another. At the ZKM either aspect – each for itself and with one another – are given a voice. The Bauhaus, founded in Weimar in 1919, may serve as a model.«²¹

– Heinrich Klotz²²

ZKM seems to be the first cultural institution in Europe and even the world to try to explore the boundaries between art and technology. Since its establishment in 1997, ZKM has held various forms of exhibitions and events, which involve experimental artworks in digital technology and natural sciences. Moreover, ZKM and CyberForum founded AppArtAward to encourage artists to use APP as a medium to create artworks. »Flow clock«(12) won the praise of 2014. It uses technology to unfold people's time stream of the daily life on the screen in an aesthetic way. Because of the efforts of these new media art institution, more and more scientists and artists are working together to explore how to integrate art and technology.



11. ZKM



12. Flow clock

These new media art institutions also try to help artists and influence more people from technical aspects. For instance, Ben Fry and Casey Reas, who come from MIT media lab, have developed a program language »Processing« and provided it as open source, which enables more artists and art students to have access to digital art and creative programming. They each found their own ways to develop artistic vision and discovered new methods to integrate technology and art, creating new ideas and spaces for artists.

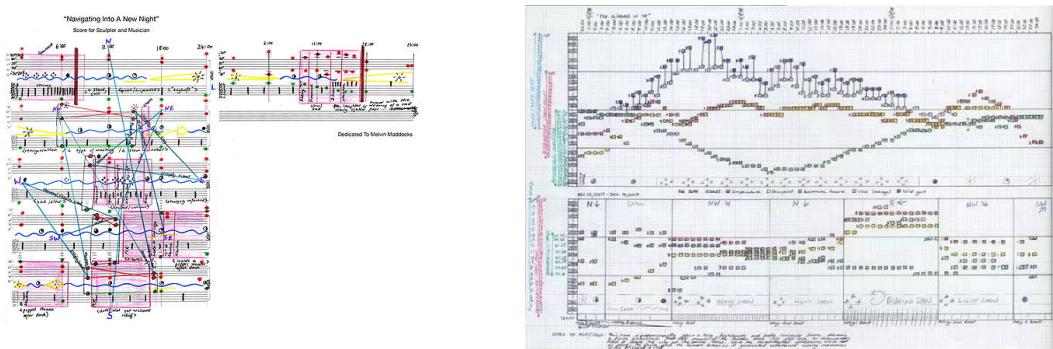
As a digital-interactive art creator or designer, it's worth thinking about that how can we create and learn to appreciate the attachment with objects, enabling visitor to

²¹ https://en.wikipedia.org/wiki/ZKM_Center_for_Art_and_Media_Karlsruhe

²² Heinrich Klotz (1935-1999), the founder of ZKM/Zentrum für Kunst und Medientechnologie in Karlsruhe.

transcend literal and formalistic forms of interaction, entering into an intimate, emotional and infinite space, where people can actually face with the heart.

The only tool is artistic imagination. Without artistic imagination and creation, technology will be like a human has no soul, and every art form will be like that people are blind when walking. Only when we truly merge the technology and art creation together, can we define our position in the future. New media art's future is the same. From my perspective, the future development trend of new media art is »Gesamtkunstwerk«²³, which means a synthesis and unification of all kinds of arts, breaking the boundary.



13、14. Navigating into A New Light

Nathalie Miebach is a climatic artist, who cooperated with musicians, translated meteorological conditions' changes into music, in order to wake up as many people as possible to build a sacrifice ecosystem. It is »Gesamtkunstwerk« thinking way, which combines different fields, presented in an artistic creation, depending on curiosity, imagination, creativity to expand horizon, break the old thinking pattern, and gain or wake up people's believes. So, New media art and new technologies continue to develop and will eventually meet at the top of the mountain, reshaping people's lifestyle and concepts.

5. Conclusion

No matter how the society will develop in the future, no matter how many new technologies are produced, our era is such a restless time, full of the unknown. New media art was born with the responsibility to reflect on the past, to challenge the

²³ »Gesamtkunstwerk« is a work of art that makes use of all or many art forms or strives to do so. The term was first used by the German writer and philosopher K.F.E. Trahndorff in an essay in 1827.

present, to create the future. And new media artists are always seemed to be the explorers of discipline boundaries, and express doubts and reflections on culture, society, nature and so on. So, new media art is the mirror, which reflects the humanity, the society and the age, which helps People to understand the world and communicate with the time and themselves.

Appendix:

Abb.1: Hallo, elephant.

<https://www.mutualart.com/Artist/Nam-June-Paik/BC44AEA7A8F9403E/Artworks>

Abb.2: Oscillon7 (Ben F. Laposky).

Frank, Herbert W. 1971. Computergraphik Computerkunst. Munich:Bruckmann

Abb.3: Statue of Liberty. 1986.

<http://www.knowltonmosaics.com/pages/LibLaz.htm>

Abb.4: Apple Lisa's Graphic User Interface.

https://www.mprove.de/visionreality/text/3.1.8_lisa.html

Abb.5: test pattern 2008.

<http://www.ryojiikeda.com/project/testpattern/>

Abb.6: Say Superstrings.

<http://www.ouchhh.tv/>

Abb.7: Rain Room 2012.

<https://art.team-lab.cn/w/iwa-waterparticles/>

Abb.8 : Movie-Drome.

<http://www.stanvanderbeek.com/>

Abb.9 : Forest of Flowers and People: Lost, Immersed and Reborn.

https://www.teamlab.art/w/crows_flying/

Abb.10: crows are chased and the chasing crows are destined to be chased as well.

<https://art.team-lab.cn/w/flowerforest/>

Abb.11:

<https://zkm.de/de>

Abb.12: Flow clock

<http://www.app-art-award.org/rueckblick/>

Abb.13、14: Navigating into A New Light.

<http://nathaliemiebach.com/musical.html>