2020

# EXPLORING THE CREATION OF IMMERSIVE AND RESPONSIVE SPACES FOR INTERRELATIONSHIP THROUGH THE CONCEPT OF PLAYFULNESS

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Exploring the creation of immersive and responsive spaces for interrelationship through the concept of playfulness.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Fine Arts at Virginia Commonwealth University.

by

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May, 2020

# Acknowledgment

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Abstract

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The COVID-19 pandemic that began in early 2020 is causing serious damage to
many countries. As of May, the number of confirmed patients worldwide is at 3.35 million
and the death toll stands at 239,000 people. As a way to prevent the pandemic, most countries
encourage people to keep social or physical distance and self-quarantine. According to the
U.S. Centers for Disease Control and Prevention, they recommend that people stay at least
six feet away from each other and the South Korean government also recommend keeping
their distance from each other at least two meters.

Because of the current situation, the places where people can interact with each
other, such as schools, businesses, restaurants, etc., are not able to function properly because
of the prevention of people's physical contact with each other and the need to 'social
distance' and this is causing continued economic deterioration. Through this pandemic, I
have realized once again how important interrelationships are in the society we belong to, and
at the same time, how the society we live in has been changed by modern technologies.

With the development of automobiles, machinery and technology day by day, these modern technologies have become a natural convergence of our society. But as a result, teenagers, in particular, were exposed too much to the information technology, such as mobile phones and computers, and such developments have caused a lack of thinking, creativity and physical abilities, resulting in a cut-off in communication with each other, and making it a non-face-to-face and isolated society.

People in various fields, such as philosophy, sociology, and art, talk about how important each other's interrelationship plays a role in shaping the framework of society. While the development of technology is increasing the number of people who are becoming isolated from society, the development of these technologies now helps people engaging in constant exchanges to escape the isolated environment by allowing them to see and communicate with each other at a time when they have to maintain a distance of more than six feet or be isolated at home by the COVID-19 pandemic. An important difference in the impact of technology on well-being lies in other aspects of technology, how it is used, and with other users and situations.

Just as the technological developments exemplify the potential to have a positive impact on people's lives, I also aim to apply a positive use of technology to create a virtual interactive space where people can once again feel how important interrelationships are in our society through experiences. I have so far emphasized two things, the concept of playfulness and designing a virtual interactive space optimized for engagement and play, for the past two years to create the virtual space based on my experience. The goal of my thesis work, based on the two things that I have emphasized greatly above, is to build an environment in which audiences can share various movements through cooperation without

being restricted by their actions or aware of the surrounding environment, to enhance their thinking, creativity, and engaged living by using the design I envisioned through instilling positive emotions. Unfortunately, my thesis work could not be installed due to the current pandemic and it is also unclear that if the design I structured for people was successful. It greatly affected the development of work, and made it impossible to install and interact with various "players" in that it is necessary to return to South Korea due to the closure of the studio and the pandemic.

Vita

Yonghun Jung was born on March 04, 1993, in Goyang-Si, Gyeonggi Province, and is a citizen of Republic of Korea. He graduated from Indianhead International School, Uijeongbu-Si, Gyeonggi Province in 2011. He received his Bachelor of Fine Arts from Alfred University, Alfred, New York in 2017.

Exhibitions

2020 – Fine Arts Building Gallery "Acid Waste" Richmond, VA, USA.

2019 – The Highpoint "Forever Young" Richmond, VA, USA.

2018 – Anderson Gallery "Sponge Bob" Richmond, VA, USA.

In my studio research as a graduate student, my goal has been to create interactive environments that appeal to people and whose main function is to provide a visual experience that inspires audiences to physically engage with colorful, moving graphics and perhaps with each other. I was a ceramic artist in my BFA program prior to VCUarts' graduate school. While studying ceramics, I was interested in making the texture or color of glazes, but in my senior year, I wanted to add more vitality to ceramic objects instead of glaze that felt done and no more room to explore. Professor Andrew Deutsche, then my academic adviser and head of the Expanded Media program at Alfred University, advised me to use video and sound as collaborative elements with ceramic objects. Once I experienced the dynamic motion and numerous color changes in video and electroacoustic sound, I became deeply interested in new media more than ceramics. Then, during my video class, I happened to see the works, *"Bosphorus: Data Sculpture"* and *"Black Sea: Data Sculpture"*, by Refik Anadol, which led me to apply for graduate school for media arts. His works still give me a lot of inspiration, both visually and his conceptual ideas. The depth, color, movement and image quality of his works slowly sucked my consciousness into them like a black hole, and I was blown away and though I know he made the work it seems incredible that a person could make work that is so impactful.

Later, I found out that his work had a lot to do with video works using generated coding, and as I studied Processing, a programming language in which I learned about the visual phenomena that are randomly created within the program. They brought me great interest in the present and the past. Most of the phenomena had been generated by digitally programmed random processes under the algorithm. This has inspired me to also create visual patterns generated by the algorithm that I wrote in the program. As I focused more on creating visual phenomena that are randomly generated, I wanted something more dynamic and energetic in

both color and movement in real time instead of generating an iteration of them, and in reading the book of Katja Kwastek, *"Aesthetic of interaction in Digital Arts"*, for the first time I was introduced to unpredictability in interactive work.

According to her book, the graphic images using algorithmic operations were often in constant motion, the incorporation of random operators allowing for variability in their form and sequences of movement, but these processes were only in the form of an intrasystem interaction between program components.[i] Myron Krueger emphasized the analogies between random operators built into systems and the unpredictability of the actions of recipients. In interactive media, the participants are the source of the unpredictability.[ii] Based on the content of this book which includes Krueger's argument, the idea of unpredictability led me to produce the unexpected beauty that changes in real time due to people's interaction, extending beyond the random visual phenomena created by the early programmed codes. The unpredictable gestures of audiences were converted into random numbers in the program, and then those converted numbers generated remarkably diverse colors, shapes, and scales of shape on the screen in real time.

I believed that the great advantage and attraction of media art was in the visual images shown on the screen, and I was so absorbed in creating such images that I could not meet the conditions of creating a truly interactive work. Krueger said, "The visual responses should not be judged as art nor the sounds as music … the "degree of physical involvement" is far more important than "illusion" or "3D scenery."[iii] While I was looking for ways to induce a variety of unpredictable behaviors of audiences in my work, I found that all actions were derived from reactions and that I had to adjust the environment in which I could naturally elicit such reactions from audiences in my work space.

The reactions that I hope to produce were playfulness and curiosity. Although curious at first, most people became immersed by the experience of physical interaction with images of visually rich and intense colors and motions. Maybe it was because of their childlike fascinations for pleasure of cause and effect processes? As Jay Bolter and Diane Gromala observe, "They ask us to react playfully and to wonder whether it is appropriate to play in an art gallery" as we "see ourselves as participants in the dance of our culture."[iv]

Most important thing in interactive work for me was to create a place that invokes the participant's curiosity and encourages playfulness. Allan Kaprow emphasized the importance of creating the space by saying "in the present exhibition we do not come to look at things. We simply enter, are surrounded, and become part of what surrounds us, passively or actively, according to our talents for 'engagement.' …"[v], so I manipulated the environment of the exhibition space to elicit those reactions and strengthen an engagement between my interactive works and audiences.

In my previous work, *"Tooniverse"*, various sensors were used to create such a space where audiences wanted to interact with my work without losing interest and curiosity and made visual phenomena on the screen constantly respond to their movements. First off, I attached a proximity sensor, which measures the distance, to the backpack in order to detect the presence of audiences. Once the audience entered the area I set up, instructions appeared on the screen to tell them how and what to do step by step, while the sound score filled the space engaging the visitors to the space to put on the backpack and interact with my work. The accelerometer sensor, attached to the backpack, was a speed sensor that measured a velocity of audience member's movements, and it allowed audience members to generate the visual phenomenon when they move actively using the capacitive sensor attached to the right hand. The data received from the

accelerometer sensor also enabled the participant to change the color, shape, and size of visual

phenomenon using the speed that constantly changed in real time, which aroused interest from

audience members. Another capacity sensor, attached to the left hand, also used the speed of the

accelerometer sensor to change the color or pattern of the background when people move the

capacitive sensor as they press it.
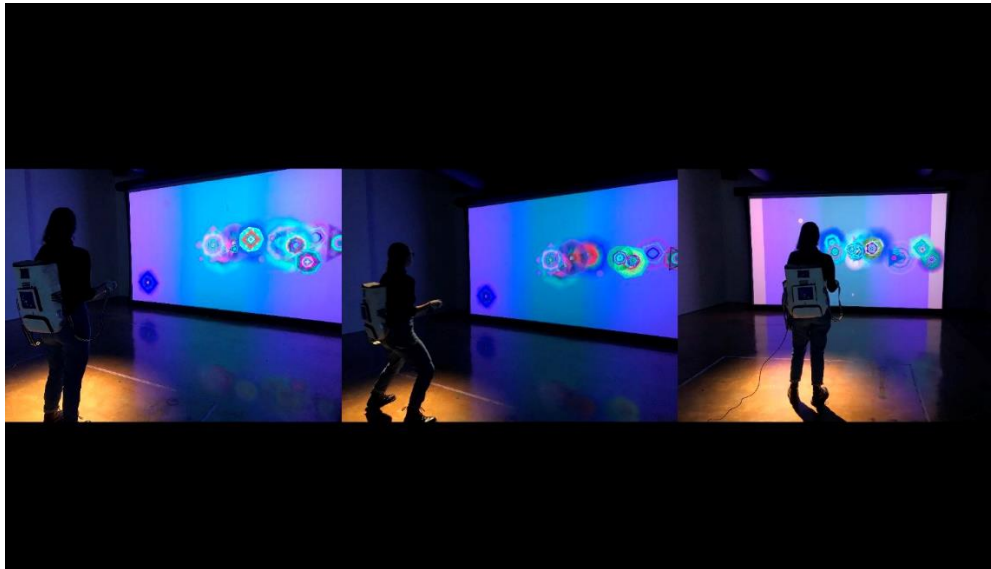


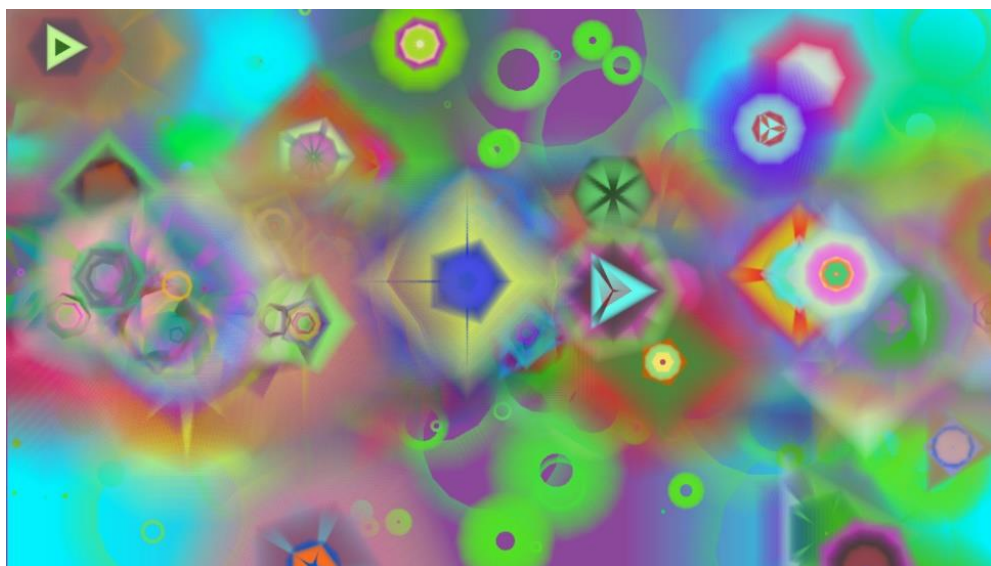*Documentation of audience member with Tooniverse.*



*Image created by audience interaction with Tooniverse.*

As I researched people's behaviors and reactions, and as the interaction between them and my work became my main concern, I wondered if I could do art that has a purpose, extending beyond just presenting visual aspects. My current work is inspired by the research of Jim Blascovich and Jeremy Bailenson on Edward T. Hall's study on proxemic behavior on interpersonal communication. Based on Hall's research, there are four types of distances people keep: intimate (0 to 18 inches), personal (18 inches to 4 feet), social (4 to 10 feet), and public (over 10 feet). The interpersonal distance rules in American culture tend to involve greater distances than those in other countries. The United States is a country that likes its space. People have different proxemic distances because of different cultures that they grew up and experienced. Balscovich and Bailenson experimented with whether proxemic distance exists between people and avatars through designing the virtual space, and as in reality, the distance still applies equally between them. Not only this, but also in their other experiments, I can easily find that people's actual psychological states and behaviors are consistent with real space while in the virtual space. The idea that I had here was that if people's behaviors were reflected in virtual space as well as real life, wouldn't it be possible to make life better during the current issue we are living in, a pandemic?

The effects of today's Covid-19 pandemic on the world helps make clear to me what I have been wanting to express to people. Many countries are suffering severe damage from the COVID-19, starting in early 2020. As of now, in May, the number of confirmed cases worldwide is 3.35 million and the death toll is 239,000 people. It causes respiratory problems, which is similar to the flu, accompanied by symptoms such as coughing and fever, and in severe cases, breathing difficulties. Since the COVID-19 is usually transmitted through coughs or sneezes, it

can be prevented by washing hands, not touching faces, and avoiding contact with people through keeping the social distance. According to the U.S. Centers for Disease Control and Prevention, they recommend that people stay at least six feet away from each other and the South Korean government also recommend keeping their distance from each other at least two meters. Governments in each country strongly recommend people to stay home and do not go to the places where people are congregated. As a result, most schools are turning classes into Internet lectures, many office workers work four days a week or at home, and many restaurants are temporarily closed.

What I want to emphasize here through my work is that because of the current situation, the places where people can interact with each other, such as schools, businesses, restaurants, etc., are not able to function properly because of the prevention of people's physical contact with each other and the need to 'social distance' and this is causing continued economic deterioration. Through this unprecedented event, I also see how useful the work I want to make could be for people in the future.

For example, I felt how communication technologies such as mobile phones have become a natural part of our society, an extension of our self, acknowledged by my service provider, as I received a message from AT&T that I would be temporarily added 10GB of data for 60 days and felt how communication technologies such as mobile phones naturally permeated our society. In another example, in South Korea, a game called "Animal Crossing" was seeing sales surge in March as much as masks, gloves and hand sanitizers. When the game first came out, the price was $64, but when I checked a few days ago, the price went up to $140 and is currently out of stock, so those who want to buy the game have to wait until April. Then why is this game so famous at this time of the pandemic? It is a game in which two people, NPC

and user, move to an uninhabited island to carve out the place. Users can make furniture and clothes as they want and decorate villages inside their islands. They can also catch bees, butterflies, insects, and even tuna and sharks and donate them to museums for display. The reason why this game is so popular with people now is that even if they stay far away due to the pandemic, they can connect Wi-Fi to cooperate and decorate the villages together. Various activities such as fishing, insect collecting, and crop cultivation can be shared with others in the gaming world. As difficult situations like the pandemic approaches today, it clearly shows how many more people rely on modern technologies to overcome difficult situation like the COVID-19, and how much they miss the relationship between people.

We have so far adapted for granted to the living environment created by new technologies that develop day by day, and the current situation once again highlighted how these technologies have assimilated into our society. In Everett M. Roger's essay, *The Extensions of Men: The Correspondence of Marshall McLuhan and Edward T. Hall*, I became aware of Edward T. Hall's research, and the idea of extensions of man in the essay. The impact of this essay guides my investigation on what I want to create for people. As McLuhan's ideas became apparent throughout his discussion with Hall from 1950 to 1960, technology has been the main cause of social changes in society, and the mass media and other communication technologies have shaped society of today.[vi] One of the most important ideas attributed to McLuhan is that the mass media are extensions of man, with new communication technologies allowing individuals to be exposed to news events from afar, and to exchange messages with others at long distances.[vii] Here, McLuhan's "extensions of man" eventually developed scalability for everything people do with their bodies. McLuhan stated, "All media, from the phonetic alphabet

to the computer, are extensions of man that cause deep and lasting changes in him and transform his environment".[viii]

As all these technologies are advanced from our bodies, they are continuously creating a new environment for us to live with. Over time, we have merged with the technologies and gradually reduced the need of using our bodies, creating a rapid decline in physical activity. As reported by ICSSPE, the International Council of Sport Science and Physical Education, *"In less than two generations, physical activity has dropped by 20% in the U.K. and 32% in the U.S. In China, the drop is 45% in less than one generation. Vehicles, machines and technology now do our moving for us ..."[ix]* Not only this, but also in my country, Korea, the physical activity of Korean teenagers is the lowest in the world. Starting from 2016, the WHO, World Health Organization, surveyed the physical activity of students aged 11 to 17 in 146 countries, and 94.2 percent of the students were classified as lacking exercise in Korea, the highest among the surveyed countries[x]. The problem of lack of exercise in the youth is not only the issue in Korea, but in the world, and experts say the development of information technology, especially computers and mobile phones, is fueling youth lack of exercise. From the talk of Jane McGonigal, *"Gaming can make a better world"*, the average young person today in a country with a strong gamer culture will have spent 10,000 hours playing online games by the age of 21. For children in the United States, 10,080 hours is the exact amount of time they will spend in school, from fifth grade to high school graduation if they have perfect attendance.[xi]

What will happen to society and culture in the future if teenagers focus on their own personal time through machines or technologies without interacting with each other? The work of Scott Snibbe offers insight in many ways while working on social interactive work. He believes that 'human mental structures and processes, including languages, ideas, memories, and

preferences, all emerge from our interactions with other individuals and society,' and he hopes to 'portray this interdependence of individuals with their environments and with each other through bodily interactions'.[xii] Like the interdependence of individuals, he said, the world we live in is made up of a community, everyone including myself have had or will have many experiences in our lives, but everything big or small cannot be accomplished without mutual cooperation. According to the theory of Merleau-Ponty, *"Intercorporeality"*, the culture has been constructed through interactions with others. While humans are engaging with each other, they form social rules together, and at some point, they all follow the social rules without mediation or thought. That creates the movements we practice in and with society every day. Nick Crossley, British sociologist, also said that we collaboratively make the societies we interact in, as we are acting in them, and societies are always already intercorporeal, are 'hives of on-going, situated actions, and these actions constitute and reproduce those spaces and that world'.[xiii]

However, I am not saying that it is bad just because people spend a lot of time on electronics or rely a lot on them. What we must know is that the world never stops advancing. Important differences in technology's impact on well-being lie in other aspects of technology, the way it is used, and other users and situations.[xiv] For example, a videogame can be both good and bad for wellbeing (even simultaneously) because different aspects of it can foster prosocial behavior, while other aspects of it desensitize to violence.[xv] Meaningful gameplay is also becoming more common, with games for change that tackle real-world problems- such as the Facebook game *Half the Sky*, which empowers players to make donations to schools for girls in developing regions, or *FoldIt*, which helps players team up with scientists to research new cures for cancer.[xvi] Looking at remote communications technologies such as Zoom and Skype today, while current pandemic is rapidly reducing the direct interaction between people because of

maintaining a distance of more than six feet or being isolated at home, the technologies help them engaging in constant exchanges to escape the isolated environment by allowing them to see and communicate with each other wherever they are.

Perhaps this time we feel a great deal about the importance of relationships between people in our lives through social distance and self-quarantine because of the COVID-19 pandemic. Like the example above, I aim to apply a positive use of technology to help people live a better life. Just as video games and other remote communication technologies exemplify the potential to have a positive impact on people's lives, I also want to use the positive aspects of technology to create a virtual interactive space where people can once again feel how important interrelationships are in our society through experiences. Unfortunately, my thesis work could not be installed due to the current pandemic and it is also unclear whether the design created for people was successful. The closure of the studio and my subsequent need to return to South Korea have had a great impact on the development of work, making it impossible to install and interact with multiple "players." Nevertheless, my goal is to build an experimental space in which audiences can share various movements through cooperation without being restricted by their actions or aware of the surrounding environment, to enhance their thinking, creativity, and engaged living by using the design I envisioned. There are two things that I have emphasized over the past two years to build a space where people can learn based on their own experiences.

First is the concept of playfulness. While I am creating works, others often asked me why they should be playful. I still cannot give a definite answer, but perhaps I value playfulness due to my childhood. As I said above, I also had few opportunities to interact with the people around me like any other Korean teenagers and spent too much of time alone in my childhood. In the past few years, South Korea has been measured as the country with the highest suicide rate

among OECD countries. Of course, as everyone knows, stress is the biggest factor, but anyone in any society can be under stress. Then why does Korea have the highest suicide rate? It is because we do not know how to express or share our feelings or thoughts to the people around us. We have not had a proper education at an early age on the importance of interrelationship with others. Since I grew up in this Korean society, I might unconsciously want to include positive emotions and activities with others in my works. Of course, there is other evidence by other researchers that reveal how positive emotions from playful environments, such as I aspire to create, can be beneficial to people. Barbara Fredrickson argues that while negative emotions narrow our options in order to facilitate quick survivalist decision making, positive emotions do the opposite. "The positive emotions of joy, interest, contentment, pride, and love appear to have a complementary effect: They broaden people's momentary thought– action repertoires, widening the array of the thoughts and actions that come to mind,"[xvii] and her findings show that just as negative emotions can spiral into depression, positive emotions can spiral into flourishing, positive emotions are evidently worth cultivating not only for their own sake, but also because they generate stable mental health.[xviii] Alice Isen suggests that positive affect leads to "broad, flexible cognitive organization and ability to integrate diverse material," and her studies clearly show how happy moods lead to more open-ended thinking and effective problem solving.[xix] Moreover, Sonja Lyubomirsky, Laura King, and Ed Diener (2005), for example, show how positive moods facilitate a variety of positive outcomes.[xx]

The second is to design a virtual interactive space optimized for engagement and play. From my experience in making interactive work so far, it is important to think about how to invite people to the play space, hold them in the space for long enough for them to fully engage with the space and other people in it, and make a strong impression on them. In considering what

determines the type of space and experience I am working to create, I turn to Don Norman's peak-end rule. It shows that our memories of events are not aggregations of our moment-by-moment experience, but rather a *reconstruction* based on what we felt at the *peak* of the experience and what we felt at the *end* of it.[xxi] Rather than focusing on the moment by moment experience, I want to design for better memory that led to greater wellbeing and repetitive visits in the long term. Norman believes that seeking a good remembered experience is more important than seeking a perfect moment-by-moment user experience, and in his article for the journal *Interactions of the ACM*, "Memory Is More Important Than Actuality" (2009), he points out that "[when we remember] events, some things fade from the mind faster than others. Details fall away faster than higher-level constructs. Emotions fade faster than cognitions."[xxii] Our reflective ideas about an experience will last longer than the fleeting frustrations that form part of that experience at the time.[xxiii] Therefore, the peak-end plays an important role here. Applying this rule can inform me as I summon delightful experiences that can accentuate the positive and overwhelm the negative.

While I am making the interactive work based on the two things I emphasized above, there is something important I want to mention besides these two, and that is how to bring out people's surprises and curiosities in the beginning. The Norman's peak end rule is crucial since it would lead people to my intended response without breaking the flow in my work, but what would lead them to the end if I cannot extract these positive emotions from people before everything? The things that keep people engaged are wonder and awe. Without these emotions, people will be confused, and eventually leave my work behind. In order to summon the people's curiosities and surprises, I need to show them clearly what effects their gestures can create and display on the screen.

That led me to use the skeleton detection of the PoseNet for my thesis work. It can catch audiences' entire movements easily and quickly convert into the data that can create a generative sound and visual in the generative program. The visual phenomena will be created and seen as interrelationships. I am structuring it in a way that motivates people to play, collaborating to generate the visual phenomena and more actively participate in play. I do not want a system that is like many existing games where immediate reward is given based on circumstances, but I hope people once again instinctively realize how attractive the visuals are that they create together as they move their bodies together, and how relationships between people are important. As people narrow the distance between each other, they will be able to create complex forms and the colors that match them so that can continuously encourage them to interact with each other. Moreover, I am also working on generative sounds that change according to their distances to be constantly curious about their interactions.

*Testing my work using a human model in a magazine while isolating myself at a Korean house due to the COVID-19 pandemic.*
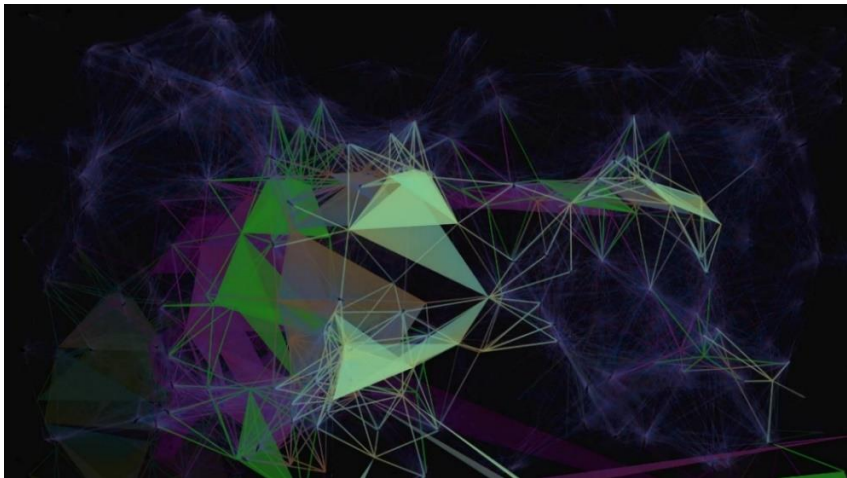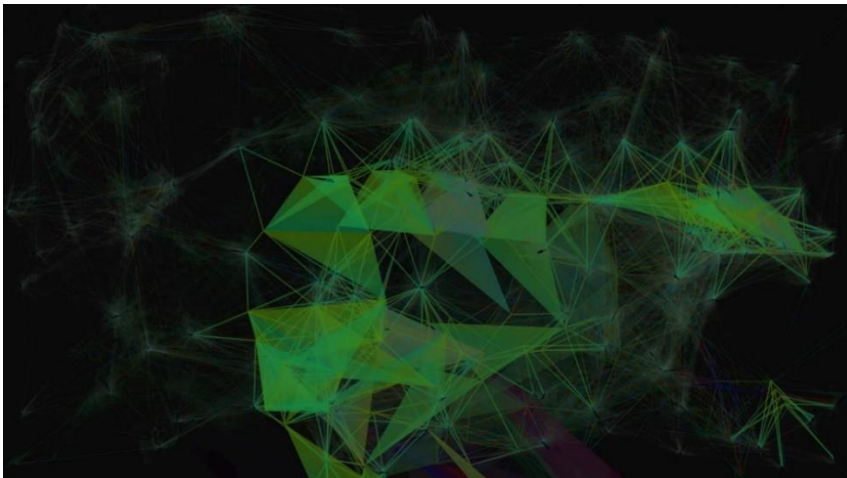
*Images created by the interaction between me and my family.*

I have not been honest enough with myself so far. Perhaps because of the culture that I have grown up in until now, it was very awkward to share what I wanted to do with others and thought I should make such work that could be recognized by them. After all, I suddenly thought that this was because I spent a lot of time on high-tech technologies such as cell phones and computers instead of having enough opportunities to interact with others during my adolescence. These developments have affected my personality, and seem to be trying to alienate me from relating to other people. I now want to create spaces and experiences that are playful, encouraging, and accepting through interaction with others. It is virtually impossible to bring great changes to people in a short time because of my lack of knowledge in using technology. But the time has passed for me to think about what the technology can do and show me, as it did in the past. Now I know for sure why I want to use them. As mentioned above, today's technology is always advancing. It might be a matter of time to have the products with better performance or new features, and no one can predict what adverse effects these technological advances will have on society. However, if improving the quality of life were the intention for the development of technology, as it is for my development of my artwork, then the emerging technology would be positive. I am motivated and passionate about working in that direction, to help people lead better lives adding opportunities for playfulness, not for escape but to remind the body and spirit of the importance of play and fun to maintain balance in life. Through my thesis research, I have realized that in order to create a truly meaningful space of interaction in people's lives, expertise such as sociology and psychology must be based above all, and I will continue to strive to create more complete works through these professional references, and the opinions and cooperation of experts in the future.

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xvii Ibid., 110.
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xx Ibid., 111.
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