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Author	张, 语欣(Zhang, Yuxin) 稲蔭, 正彦(Inakage, Masahiko)
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Master's Thesis
Academic Year 2021

Breathe: An Interactive Artistic Installation
Providing an Immersive Experience to Emphasize
the Relationship between Daydreaming and
Creativity

Keio University
Graduate School of Media Design

Yuxin Zhang

Yuxin Zhang

Master's Thesis Advisory Committee:

Professor Masa Inakage   (Main Research Supervisor)

Senior Assistant Professor

Junichi Yamaoka   (Sub Research Supervisor)

Master's Thesis Review Committee:

Professor Masa Inakage   (Chair)

Senior Assistant Professor

Junichi Yamaoka   (Co-Reviewer)

Professor Kazunori Sugiura   (Co-Reviewer)

Abstract of Master's Thesis of Academic Year 2021

Breathe: An Interactive Artistic Installation Providing an Immersive Experience to Emphasize the Relationship between Daydreaming and Creativity

Category: Design

Summary

The era of AI may become a reality in the upcoming future. As we are so eager to look for what more AI can do for benefits, it is necessary that we should also consider the unseen dangers. What if AI continues to take over our abilities as human beings? Where could we find our unique creativity that AI is not able to generate?

In this research, daydreaming is viewed as a great way to find the uniqueness of human creativity. The design is based on the idea of daydreaming, which is associated with human creativity and imagination. Breathe, as a speculative design, looks into the future and try to find a way to increase human creativity by daydreaming.

Keywords:

speculative design, creativity, daydreaming, imagination, interactive installation

Keio University Graduate School of Media Design

Yuxin Zhang

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Chapter 1
Introduction

As an artistic installation, Breathe provides an opportunity for people to experience visualized daydreams. This is necessary because daydreaming is positively associated with imagination and creativity. This idea considers a possible future where many adults will lack creativity due to the development of Artificial Intelligence (AI). Breathe starts from the idea of a speculative design to sending a message that we should enjoy our rights to daydream and cherishing our creative abilities.

1.1. Background

1.1.1 Challenges

In this modern society, human life depends on the high-speed development of science and technology. An era where AI dominates may become a reality soon. Although we are excited about the benefits of AI, we must also consider the downsides. The risks of increased reliance on technology are technological addiction, a decreased willingness to struggle, a weaker connection to nature, a diminished sense of competence and free will, and the degradation of automated skills(Castelo et al. 2019). It is not obvious to recognize these potential risks while carrying out easy tasks, such as calculating a simple mathematical equation, but what if AI continues to take over our ability to function as human beings?

In the past 50 years, scientists and artists have been working together to develop a computer program that can generate arts(Mazzone and Elgammal 2019). The AI process developed for making art (AICAN) has moved towards creating autonomous artificial beings by exploring their potential for creativity(Erden 2010). This development may lead to a future where creations are mass-produced us-

ing AI. The initial purpose of AICAN was not to replace human creativity but rather to seek cooperation between artists and AI systems. However, by learning from past experiences, when human minds tend to hand over tasks and associated responsibilities to technologies, this mental handover could reduce vigilance(Grissinger 2019). Creativity and imagination could be stymied if artificial beings continue to do the work for us.

Creativity is our last refuge, or the 'final frontier' of which no machine can conquer(Colton et al. 2012). Nowadays, our refuge is under threat. In the future, if not only artists but also ordinary human beings lack creativity due to a reliance on AI creations, then where we could find our unique creativity that AI is unable to generate? This design considers the idea of daydreaming, which is associated with human creativity and imagination.

1.1.2 The Definition of Daydreaming

Daydreaming, also known as mind-wandering, is an activity where thoughts and imagination arise when attention drifts away from external tasks and perceptual input to a more personal or internal steam of consciousness(McMillan et al. 2013). In past generations, daydreaming was often considered a negative state of mind or a waste of time. This concept is despite psychological research showing that participants spent about 47 percent of their time daydreaming while awake(Killingsworth and Gilbert 2010). Thus, many people daydream very frequently. However, we are often told to avoid daydreaming and ignore thoughts that appear in our daydreams. Children are usually told to "get your head out of the clouds." Adults are told to stop fantasying and instead focus on their work. Many people are unaware of the one big advantage of mind-wandering: its relationship with imagination and creativity.

1.1.3 Daydreaming and Creativity

Mind-wandering, or daydreaming, allows human beings to take a journey into the sub-consciousness level without the disturbance of electronics. Our minds naturally float everywhere we want. These daydreams are all different depending on who we are. First, imagination is the mother of creation, and they are in-

separable. According to Albert Einstein, "imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution(Reid 2000)." We can imagine a fantasy world that can never be found on earth in our daydreams, but AI obtains so-called wisdom only through analyzing and integrating existing big data. This idea means that it copies and understands the past better than anyone, but it cannot imagine the future because the future does not appear in the past. Second, human creativity relies on lived experience and cultural backgrounds that AI cannot replicate(Mazzone and Elgammal 2019). The content of our daydreams varies depending on our life experiences, desires, emotions, and cultural backgrounds. Therefore, daydreaming is an ideal place to find creativity and imagination, and this is something that AI can never achieve.

There have been many studies showing the positive relationship between daydreaming and creativity. The Unusual Users Test, which asks participants to think of as many uses as possible for a simple object, such as a brick, is run by the Department of Psychological and Brain Sciences at the University of California, Santa Barbara. This test has proved that mind-wandering caused by engaging in easy external tasks may facilitate creative problem solving(Baird et al. 2012). Mind-wandering allows various parts of the brain to 'communicate' and causes 'dialogue' to occur(Kolowich 2016). This is a helpful ability if we are capable of volitional daydreaming(McMillan et al. 2013).

1.2. Proposal

Breathing is the basic vital sign of life. If a person stops breathing, it represents the end of his or her life. This work introduces the concept of breathing and proposes that human beings need creativity just like we need fresh air. Daydreaming, a source of creative elements, is like "oxygen" that allows people to "breathe" to their heart's content. The theme of breathing implies that, as human beings, we are only alive in the truest sense if we maintain our unique creativity. In addition, deep breathing is a way to help people turn to daydreaming(Field 2021). Breathing is a natural and common behavior just like daydreaming, and both deep breathing and daydreaming make people relaxed. This project is inspired by

speculative design, a discursive practice based on critical thinking and dialogue, by putting forward the possibilities and problems of the future. In addition, it imagines a world flooded with artificial intelligence. As a result, many people will lose their ability to be creative. Daydreaming is used in this work to facilitate creativity and imagination. People have had prejudice toward daydreaming for centuries, and many are still not aware of the importance of daydreaming. This design reminds people of the importance of daydreaming by using it to make up for the creative ability that some will lack in the future. If we want more possibilities in the future, then we need to imagine and create by ourselves. At the same time, this installation raises doubts regarding the current lifestyle of humans by reminding people to cherish the ability to daydream and to look for creativity through imagining the future.

This artistic installation, Breathe, looks at people who have lost their creativity in the future world as the target group. This is done by capturing creative elements in daydreams from those who still have creativity, an active default mode network, to guide users into daydreaming by breathing into the creative elements, and these daydreams are visualized.

The installation uses the action of breathing to establish an interaction between the audiences and their visualized daydreams. This act thus questions whether the current human over-reliance on artificial intelligence is reasonable. It guides people to reflect on how humans and artificial intelligence can be better and how to use creativity and imagination to build a better future.

To sum up the three research questions:

- Q1: How to categorize the creative elements captured from daydreams?

- Q2: How to visualize daydreams?

- Q3: How to make the experience of daydreaming interactive?

1.3. Objective

The purpose of this research is to design an artistic installation that looks into the future and seeks a product that increases human creativity to avoid complete replacement by AI. The research also aims to emphasize the importance of

daydreaming and make people reconsider the validity of their current lifestyles. Should people live and work with such a reliance on technology to such a large degree? The design of the installation can capture pheromones from daydreams to facilitate people to improve their imagination and creativity in the future. It serves not only as a solution but also as a sign to help people question and think. With the potential exhaustion of human creativity in the future, the project informs people about the relationship between daydreaming and creativity. Therefore, this serves as a warning to people to reflect on whether it is ideal to work all day long without taking a rest for mind-wandering, leave the ability of creativity to AI, and immerse themselves in technology while ignoring the subconsciousness or any internal thoughts.

1.4. Contribution

This artistic installation, Breathe, will put forward possible problems by imagining the future and causing people to reflect on existing problems. It will provide three values for users, which are as follows:

The first value is the functional value. This solves the problem of a lack of human uniqueness of creativity in the future. By turning daydreaming into a product where people's imagination and creativity are used, it helps people to immerse themselves in a place where they can find unique creativity and imagination. This action sends a message that daydreaming is indeed a way to make up the lost creativity in the future. Besides causing people to question, the work also wants people to discover something inspirational through their daydreams.

The second value is the reflective function. Because human creativity may become a scarce resource due to an over-reliance on technology, this installation inspired by speculative design and reflective design serves as a reminder for people to put down their mobile phones and computers and cherish the opportunity to daydream in their busy lives.

The third value is to experience the joy of daydreaming. In modern society, human beings often ignore the benefits of daydreaming and consider it wasted time. Through interactive devices, people can experience the starry sky and unique elements contained in their daydreams.

1.5. Thesis Organization

The thesis consists of five chapters, which are as follows:

- In the first chapter, as above, the background, challenge, objective, proposal, and the contribution of this research are discussed.

- The second chapter mentions the literature reviews and related works linked to the three main elements of the research: daydreaming, facilitating imagination and creativity, and speculative designs.

- The third chapter states the proof of concept of this research on its corresponding themes. It also describes the design process from ideation to prototyping. The two initial prototypes and their user tests are included in this chapter.

- The fourth chapter narrates the improved design and model after passing the preliminary prototype. The final model and user test are described in this section, and the final exhibition will also be shown.

- The fifth chapter summarizes the entire research process and then analyzes and outlines the development prospects and the future plan of this research.

Chapter 2

Literature Reviews and Related Works

This research pictures a possible future where human creativity may become a scarce resource. Daydreaming is proposed to be a solution to improve lost human creativity and its uniqueness. The objective is to emphasize the importance of daydreaming by questioning current human lifestyles where problem-solving uses technologies and without imagination and creativity. At the same time, this makes people reflect on the fact that we tend to use our smartphones in our spare time rather than daydreaming. There are three main categories in this chapter: daydreaming, imagination and creativity, and speculative design.

2.1. Daydreaming

2.1.1 Literature Reviews on Daydreaming

Studies have shown that daydreaming functions to encourage imagination and creativity. Scientists and psychologists came to this conclusion by studying the human brain when mind wandering. Several artworks related to this concept are also mentioned in this section.

Default Mode Network

Despite the fact that we frequently daydream in our daily lives, psychological science has focused on externally-directed, task- related, and experimentally-induced thinking(Christoff 2012). Nevertheless, over the past 20 years, there has been a historic shift towards the systematic study of internal, unconstrained cognition. This shift owes much to discovering the default mode network(Poerio and

Smallwood 2016). According to Joseph Carroll, "when the brain is not engaged in specific tasks requiring exteroceptive perception and directed action, it is not merely resting. It defaults to activity in a well-defined neural network—hence the term 'default mode network.' That network uses a substantial proportion of the total energy consumed by the brain." This quote means that the brain is not resting when we daydream but rather highly active to contribute to our mind wandering(Figure 2.1). This daydreaming network is known as the default mode network, and this area is highly related to past memory, self-knowledge, and self-reflection(Kolowich 2016). The default mode network shown in Figure 2.2 proves the positive relationship between daydreaming and imagination, and it explains why our daydreams reflect to our hidden, subconscious desires to some degree.
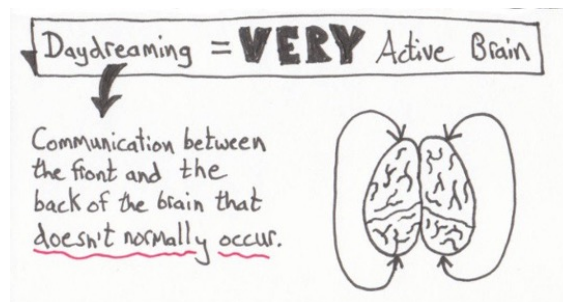
(Source: Why do we daydream? The unexpected benefits of zoning out(Kolowich 2016))

Figure 2.1 A Very Active Brain While Daydreaming
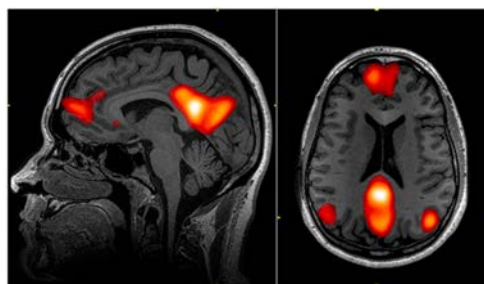
(Source: Functional MRI in the investigation of blast-related traumatic brain injury(Graner et al. 2013))

Figure 2.2 The Default Mode Network

In a conversation with Jerome L. Singer, who is known as the father of day-dreaming, he states that both daydreams and night dreams are features of the default mode network. Singer mentions that everyone has unfilled intentions that are reflected in our daydreams. Still, these fantasies found in our daydreams are not recalled quickly because our brain is so busy handling tasks in daily life(Kaufman 2013).

Dream expert G. William Domhoff, a research professor of psychology, also acknowledges that both dreams and daydreams are imaginative but largely realistic simulations of waking life. "As one network deactivates, and then another, the default network begins to ascend, just like when the strings come up or the horns begin to blare. When the default network is free to roam, that's when we dream," said Domhoff(McNulty 2017). While the default mode network is necessary to increase human imagination and creativity, it will be important if we can capture the creative elements in this part of the brain while it is active. Therefore, as it is more active than usual while daydreaming, we should make people aware of the advantage of daydreaming in the installation.

2.1.2 Psychology Cases on Daydreaming

Sigmund Freud, a well-known psychologist, proposed an idea in his lecture "Creative Writers and Day-Dreaming," where daydreaming serves as a gratification function, or in other words, a wish-fulfilling function(Seeman 1951). Literature creativity, in fact, is initially identified as an unconscious work, driven by the ability of the imagination, which is unrestricted by the constraints of rationality and self-restraint(Freud 2199). Freud points out that humans have countless unfilled intentions suppressed in our subconsciousness by social boundaries, morality, and other restrictions. Thus, artists take help of writing to express his repressed desires of their childhood(Freud 2199). It again enhances the idea that daydreams can provide unique creativity that only belongs to human because daydreams are based on personal intentions. While Freud repeatedly emphasizes the connection between daydreaming and childhood, studies have shown that the frequency of daydreaming decreases with age(Giambra 2000). We were punished for daydreaming and not paying attention in class when we were younger. However, Singer says that school teachers should recognize that children who daydream more than oth-

ers might be smarter because sometimes they are bored due to being ahead of the rest of the class(Kaufman 2013). From a study established by Schumacher and colleagues using MRI scans to monitor the brain activities of over 100 volunteers, they found out that "those who scored higher on ability tests daydreamed more than their less intellectual, or less creative peers; this means those whose minds wandered more frequently had more efficient brain systems(Mccall 2017)". Some people daydream more because they are able to accomplish a task faster than others and use the remaining time to let their minds wander. As such, daydreaming is an ability that should not be banned or ignored. This ability is going to take on greater importance in the future as it has a strong relationship with intentions and desires based on personal experiences.

2.1.3 Art Works

After reviewing scientific and psychological literature reviews on daydreaming, this section will discuss several art works on this topic.

The BEACH

The BEACH was an interactive architectural installation presented by The National Building Museum and Snarkitecture in 2015(Figure 2.3).

(Sourced `https://www.nbm.org/exhibition/the-beach/` and accessed in June 28, 2021)

Figure 2.3 The BEACH Exhibition

This work of art showed people living in the city to a beach by the sea, creating an interesting experience of a summer vacation in the Great Hall of the museum. This "beach" created a sea made by transparent balls and a shoreline dotted with lounge chairs and umbrellas. Visitors entered the entirely white environment where they could swim in the "sea," take a rest on the chair, or play with anything there.

The museum successfully gave people a place to feel like it was far away from their reality or busy lives. It was not only their bodies but also their minds that became relaxed by this installation.

Breathe shares a similar idea with this work, which is to offer people a fantasized imagination and relaxation, leading to creativity. This idea is also to remind people that they should focus more on their inner space of mind. Instead of giving people a place where they can find on earth to take a rest, Breathe tries to facilitate people to see their fantasy worlds in their minds. The worlds in our daydreams might not be located on earth, and everyone has a unique inner space to relax or get motivated; this makes human creativity possible. The Beach only shows the idea that it is nice to avoid reality but Breathe tells people to reflect on their current lifestyles and to learn to connect with their daydreams.

Jumping He's Exhibition and Book

Jumping He, a Chinese artist, opened his solo exhibition in China on March 27, 2021. He presented his works of reviewing graphic design achievements of the past 25 years. The name of the exhibition and the book published along with it is "Daydreaming," as he thinks the thoughts and ideas were extracted from his daydreams, and those daydreams have grown into integrated creations(Figure 2.4)(Figure 2.5).

Since the exhibition only included the artist's ideas, it belonged to the artist himself. Ordinary people might not be able to discover the same inspiration. However, Breathe imagines that in the future, not only artists but most people will begin to lose their creativity. Creativity will become a scarce resource like fresh air in the future. It is important for everyone, not only artists, to be able to capture their colorful ideas in their daydreams.

(Sourced `https://www.instagram.com/hesign.international/` and accessed in June 28, 2021)

Figure 2.4 He's Solo Exhibition

(Sourced `https://www.instagram.com/hesign.international/` and accessed in June 28, 2021)

Figure 2.5 The Daydreaming Book

While You Are Sleeping

While You Are Sleeping is a sculpture created by an American artist named Christina Bothwell(Figure 2.6). The sculpture describes the state of a woman having an out-of-body experience while sleeping. Daydreams and dreams share this similarity in that when our mind wanders, our soul and thoughts are freed from the body or our reality, allowing us to go anywhere we want in our minds. When the artist was asked whether her dreams influenced her works, she answered, " My dreams definitely define and influence my work! Some of my best pieces I have seen first in dreams. Sometimes I go through periods where I don't dream at all - and I panic that this source of rich material and inspiration are gone to me forever(Bothwell 2019)".

(Sourced `https://corningmuseum.photosandpictures.net/`and accessed in June 29, 2021)

Figure 2.6 While You Are Sleeping

From the literature reviews and related works, it is obvious to conclude that daydreaming is an important daily component for human beings. This fact not only allows us to escape from our reality for a moment of time but also carries out the uniqueness of human creativity, especially for artists. This concept makes us significantly different from AI. However, many artists are aware of the function of daydreaming and how to use it to form their creations. Also, many psychologists and scientists are studying daydreaming. So, how to allow normal people to learn to get ideas from the imaginary world while mind-wandering becomes a crucial point.

2.2. Facilitating Imagination and Creativity

According to the discussion above, daydreaming has been shown to have a positive relationship with human imagination and creativity. This fact provides us a general idea that if we can extract the creative elements from daydreams, as some artists do, our creativity and imagination will be increased. Breathe aims to look for a possible solution in the future to help ordinary people who lack creativity to avoid being replaced by AI. This section will review several works related to the topic of using designs to stimulate imagination and creativity.

2.2.1 Creative Interventions

The Moody Center has presented an outdoor installation named "Creative Interventions." By using temporary structures and socially distanced spaces across campus, this outdoor installation is a series of multimedia artistic works and interactive exhibits. Walking along the colorful sideways, people can play on the seesaws or watch the interesting movie playing in the tent. This exhibition aims to inspire people with unexpected moments of creativity(Figure 2.7).

(Sourced

https://moody.rice.edu/exhibitions/creative-interventions-rice-university-outdoor-structures and

accessed in July 9, 2021)

Figure 2.7 Creative Interventions

An inspiring point in this installation is that the artists are from different cultures, so their various backgrounds and experiences have resulted in different types of creations. Each work or step people take on this road is an imaginative opportunity where they can generate their own ideas inspired by others’ works.

Unlike the “Creative Interventions,” Breathe directly extracts creative elements into something can be absorbed by people so that they can create their own daydreams. Moreover, different to the way “Creative Interventions” encourages people to become more creative by presenting ideas, Breathe considers another future problem. To avoid people losing their uniqueness as human beings, Breathe acts like a warning that tells people that imagination and creativity are essential both now and in the future. Daydreaming is a method we can use to find an increase in human imagination and creativity, so we must notice its importance.

2.2.2 Living Digital Space and Future Parks

Japanese digital art collective teamLab worked with Silicon Valley gallery Pace Art + Technology to create a large-scale interactive art exhibition named “Living Digital Space and Future Parks”. There were 20 innovative art pieces featured in the exhibition.

Some installations were meant for children, such as the digital aquarium (Figure 2.8). After the kids drew sea creatures, those drawings appeared in the virtual aquarium and began to swim in the sea.

(Sourced `https://art.team-lab.cn/pt/w/aquarium/` and accessed in June 29, 2021)

Figure 2.8 The Digital Aquarium

This exhibition aimed to showcase a digital playground for all age groups. It required a huge space to complete the idea to allow all age groups to participate in the exhibition.

However, Breathe uses daydreaming to increase creativity and imagination because daydreaming refers to thoughts and imagination found only in the human mind. Using the idea of the virtual aquarium installation, the sea creatures that the kids draw do not follow any rules. However, the adult mind contains all kinds of limits and definitions, so this is why we always consider children having a greater imagination than adults do. Specifically, Breathe is going to assist adults who have lost their creativity to not give up on their ability to daydream. The reason is that imagination and creativity are as important for them as they are for children in the future.

2.3. Speculative Design

An exhibition called "Future and the Arts: AI, Robotic, Cities, Life – How Humanity Will Live Tomorrow" was opened by MORI Art Museum and featured over 100 projects to help us reflect on environmental issues, human lifestyles, and the likely state of human society in the next 20 to 30 years(Figure 2.9).

(Sourced `https://medium.com/demagsign/8-spectacular-speculative-designs-44fb129eb4e2` and accessed in July 10, 2021)

Figure 2.9 XTU's project exhibited at MORI Art Museum

This exhibition is a representation for another key phrase of this research which is the speculative design. Speculative design proposals are essentially tools for questioning. They act like a mirror reflecting the role a specific technology plays or may play in our lives. Speculative design is often related to the terms such as "reflective" and "critical."

Breathe is a work inspired by speculative design. Through imagining a possible future, the installation questions whether our current lifestyles are suitable. Are we going to be replaced by AI if we lose our uniqueness of creativity as human beings? Are we going to lose our ability to daydream in the future because we use all our spare time to play with our phones? In considering changing human lifestyles and the development of technologies, the installation encourages people to daydream because of the positive relationship with creativity and imagination.

2.4. Summary

In this chapter, the author discusses literature reviews and related works for the three key elements of the study. They are daydreaming, imagination and creativity, and speculative design. First, through scientific and psychological papers, the importance of daydreaming and its association with creativity has been proven. Some artists have successfully transferred their ability to daydream into their art works. Second, the related works of how artists inspire visitors' imagination and creativity in their works are reviewed. Third, the paper states the definition of speculative design and demonstrates a case in speculative design. These three essential components comprise the framework and the main idea of Breathe.

Chapter 3

Concept

3.1. Design Concept

Breathe is an interactive artistic installation to provide people with an immersive experience to emphasize the relationship between daydreaming and creativity. It proposes that daydreams and creativity are common yet essential components for life in the same way that we take in fresh air. The concept aims to make up for future creativity loss and to cause people to reflect on their current lifestyles and understanding of daydreaming. As the development of AI is shifting from duplication to creation, AICAN has been created successfully. This project is an almost autonomous artist that is able to self-generate images after training with images from all styles and genres from the past 500 years of Western art. In the future, as AI takes on more humanlike features, artists and even ordinary people may lack creativity. This research is based on the following question: How should we encourage people to daydream to increase their ability of creativity to keep our uniqueness as human beings?

Breathe takes daydreaming as a solution to increase human creativity and imagination because our daydreams differ based on our personal and unique experiences. This idea captures creative elements from the Daydreaming Network or the Default Mode Network and turns them into smells that can be inhaled by human beings. Ultimately, people will be able to see their visualized daydreams in the installation.

The interactive part of the installation enhances the playfulness and also builds a connection between people and their visualized daydreams to imply that people can build their daydreams according to what kind of elements they want to have in their daydreams by using Breathe in the future.

3.2. Design Process

The methodology was set up to address the design process from questioning to prototyping, according to the five-stage Design Thinking model proposed by the Hasso-Plattner Institute of Design at Stanford.

1) Emphasize: Research on recent AI development and understanding of human reliance on technologies pictures a future where we may be surrounded by mass-produced AI creations. Human creativity will become a scarce source in the future.

2) Define: Daydreaming is one way to increase human creativity and imagination in the future. Literature reviews and related works on the three main elements were reviewed in Chapter 2 to build a framework for the project.

3) Ideate: Ideation consists of a questionnaire about daydreaming, brainstorming, sketching to outline of the scenario, and the installation design.

4) Prototyping: This is an experimental phase with three prototypes, including a model of the installation, a functional and interactive small version, and a final prototype which were all developed and tested at different stages of this research.

5) Test: To evaluate the effectiveness of and the users' feelings toward the installation, different prototypes were tested and refined based on the test results.

3.3. Ideation

This section describes from the initial idea of the design using observations and brainstorming to the concept sketch.

3.3.1 Observation

When people feel bored, do they sit there and daydream or play with their smartphones? When on the train, waiting in front of a restaurant, or even in the

library, the author has noticed that it is typical to witness people playing with their phones. Children tend to daydream often, but it seems that we daydream less as we age. A questionnaire was conducted to understand people's attitudes and understanding toward daydreaming.

Questionnaire on Daydreaming

The sample size of the questionnaire was 487, comprising 275 male participants and 212 female participants. Here are some essential evaluation forms concluded from the questionnaire.

Q1: Do you daydream frequently? The results are shown in Figure 3.1.

Answers	Numbers	Percentage
Yes	248	50.92%
No	239	49.08%

Figure 3.1 Results of Question 1

Q2: Do you consider daydreaming as a waste of time? The results are shown in Figure 3.2.
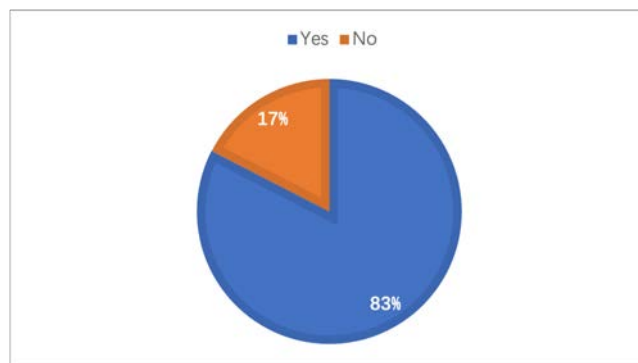
Figure 3.2 Results of Question 2

Q3: Can you recall the contents of your recent daydreams easily? The results are shown in Figure 3.3.

Answers	Numbers	Percentage
No, it is difficult to suddenly recall.	361	74.13%
Yes, it's easy.	126	25.87%

Figure 3.3 Results of Question 3

Q4: If there was a device that could prompt you to daydream and let you see your daydreams in the form of videos, would you be interested? The results are shown in Figure 3.4.
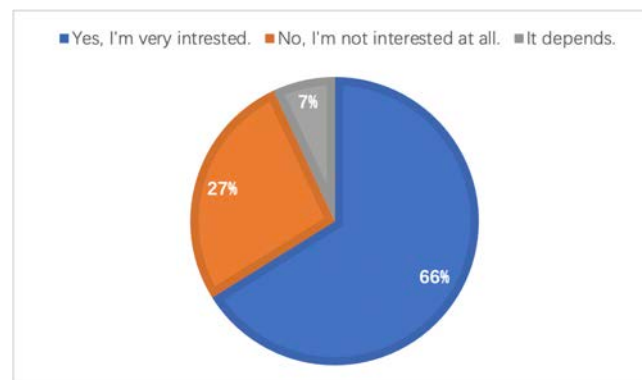
Figure 3.4 Results of Question 4

For Question 1, there was only a small variance in the answers(Figure 3.1). From the previous study, we know that daydreaming is a normal event that occurs in our daily lives. However, the results shown that only half of the participants acknowledged that they daydream frequently. This fact could simply mean that many people do not notice when they are daydreaming. Another possibility is that they do not care much about their daydreams to recognize them.

According to Figure 3.2, 83 percent of participants considered daydreaming as a waste of time; by comparison, only 17 percent of the participants thought daydreaming was not a waste of time. Therefore, most people are not aware of the importance of daydreaming, and this also explains the reason why they do not pay attention to daydreaming. For the design of the installation, the focus should be on helping people to feel the playfulness and creativity of their daydreams.

From the results of Question 3(Figure 3.3), 74.13 percent of the respondents answered that it was difficult to recall recent daydreams suddenly. They stated that they might be able to recall the contents of their dreams after a period, but not in a short time. This result suggests that most people usually do not have the habit to record what they are daydreaming about; this could lead to the loss of creativity since people miss many ideas that appear in their daydreams. Thus, if an installation is designed to inspire daydreaming and visualization of these daydreams, people can record their dreams as well as to facilitate human creativity and imagination.

Question 4 asked the participants about their attitudes toward the installation on daydreaming. Based on Figure 3.4, most people answered that they were interested in this design, and 7 percent of the participants stated that it depends on whether the actual installation would be playful. In summary, it is important in the design process to make both the appearance and interactive ability of the installation to be attractive.

3.3.2 Brainstorming

Breathing and Daydreaming

Breathing is the key concept in this design that builds an interaction between the audience and daydreaming, thus breathing in different smells generates different daydreams. There are two reasons why the author chose breathing to be the interaction. First, creativity is indispensable for human beings both now and in the future. We need creativity to survive in the same way we need fresh air. A person will die without oxygen, and without creativity human beings will have no future. Secondly, deep breathing is a way to help people turn to daydreaming(Field 2021). This idea also means breathing itself has a connection

with daydreaming. Moreover, the author has tried to use some other technologies such as eye tracking and the EEG device to detect the relaxation level and focusing level of human brains, in order to capture daydreaming. However, breathing is a more natural way to connect with daydreaming compared with other options, and daydreaming itself is a natural state of human mind. Breathing enables people to enter daydreaming through deep breathing while they might not have any idea of what would happen compared with putting on devices with high technologies. After, the real question is how to make the interaction between the two happen. The author performed a simple brainstorm, as shown in Figure 3.5.
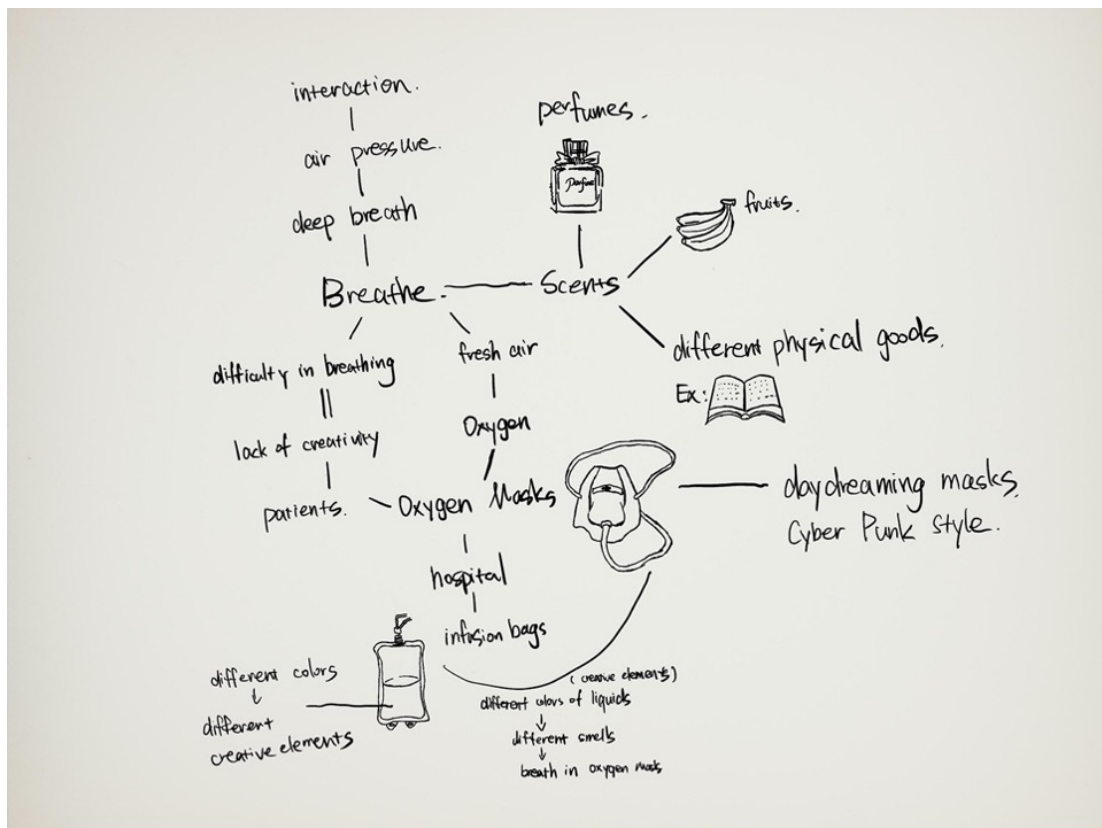

Figure 3.5 Brainstorming

Inspired by oxygen masks, the installation uses daydreaming masks to guide people towards breathing. Oxygen masks are used in hospitals when patients suffer from dyspnea, and they also serve as tools to save people's lives. For the

theme of this research, creativity represents the oxygen that is necessary for human survival. Therefore, masks using this design help human beings with insufficient creativity from their daydreams to increase their creativity by breathing in smells made by creative elements captured from others' daydreams. Moreover, infusion bags are used to store these creative elements. Liquids of different colors with associated smells in infusion bags are connected with the masks for people to better distinguish between various groups of creative elements visually. As such, people can choose what creative elements they wish to have in their daydreams voluntarily.

Categorize Four Creative Elements from Daydreams

After explaining the concept of breathing, this is the first research question: how can we categorize the creative elements captured from daydreams? The basic idea of Breathe is that we can capture creative elements in daydreams in the future. Breathing in these elements facilitates people to daydream whenever they want through the installation to increase human creativity and address the importance of daydreaming.

Currently, we do not have a method to directly capture ideas from human minds. However, as a speculative design, the author imagines that we will be capable of collecting creative elements from the default mode network in the future. This is a network most active while daydreaming and related to creativity in the human brain. After capturing these elements, we will be able to generate daydreams through combining these elements with personal stories and imagination. By enabling people to daydream anytime they want and helping them to visualize and record their daydreams, Breathe allows people to look for inspiration.

To provide different types of creative elements for people to choose what they want to daydream about, we need to analyze and categorize what kinds of creative elements are presented in daydreams. In the questionnaire of 487 participants mentioned in the previous section, the author asked each participant to briefly describe one daydream that impressed him or her the most in Question 5. There were 474 effective answers in total, while 13 answered that they did not remember at all or they did not know how to describe their thoughts. This paper shows an example of 40 results in Figure 3.6.

According to the results, the author found out that the daydreams of the 40 participants were all related to their personal desires. This again enhances Freud's theory that daydreams are unfulfilled intentions suppressed in the subconsciousness level of human beings. Four groups of creative elements were categorized based on the various kinds of desires in daydreams: Ideal Ego, Unreality, Love & Sex, Power & Wealth. These four groups concluded different types of creative elements in daydreams based on the 474 answers generally.

GroupA	Keywords	GroupB	Keywords	GroupC	Keywords	GroupD	Keywords
1	Childhood; younger	11	Cloud	21	Date	31	Lots of bank savings
2	Taller	12	Flying	22	Wedding	32	Replace boss
3	Healthier	13	Monsters	23	Kiss	33	Guns
4	Future	14	Enter others' dreams	24	Sex	34	Tanks
5	Easy life	15	Heaven	25	Be popular	35	Diamonds
6	Live in country sides	16	Magic	26	Bikini	36	Be rich
7	Quit jobs	17	Be a fish	27	Rose	37	Enough money to eat all tasty food
8	Sunsets	18	Universe	28	Ex-girlfriend	38	People look up to me
9	freedom	19	Mars	29	Crush:"I love you."	39	Lottery
10	Travel around the world	20	Superman	30	Handsome boy	40	Talk to the President of US

Figure 3.6 Description of Daydreams from Questionnaire

Ideal Ego in Group A refers to creative elements in daydreams about the imagination of a different image of self or life. Answers falling into this category related to the wishes of living a different life. For example, some participants want to be healthier, younger, or taller. Others wish to get away from their busy lives through living by the sea and watch sunsets, or quitting their current jobs and doing something they really want to do. Group B belonged to Unreality, and creative elements of daydreams in this category are unrelated to real life. For an instance, some imagine they transform into other creatures, such as a fish, in their daydreams. Some minds wander to a place that is not on earth, while others fly high in the sky and see the clouds. Group C were examples of answers for Love & Sex, and participants usually daydream about their love lives and images of bodies. Money, weapons, and power in Group D were included in the final group, Power & Wealth.

Although creative elements were divided into these four groups according to desires, each daydream is still unique based on personal experiences, cultural backgrounds, and inner thoughts. The interesting point or uniqueness of day-

dreaming is that human beings are able to create different daydreams relating to their own lives in addition to fantasies somehow related to their own lives or entirely divorced from reality.

In summary, this design put the four categories of creative elements into different smells, facilitating people to generate their own daydreams by combining personal stories with these elements while inhaling the four smells.

3.3.3 Visualization of Daydreaming

In the above section, using a questionnaire, the author categorized the creative elements in daydreams into four areas: Ideal Ego, Unreality, Love & Sex, Power & Wealth. This chapter will discuss the second research question: how to visualize our daydreams?

Daydreaming is a fantasy with consciousness. In the process of mind wandering, the images and ideas that emerge in our brains are closer to fragmented pictures. Some pictures are impressive, while others are merely snapshots of consciousness, so we do not even have time to capture them. In this art installation Breathe, daydreams are captured and recorded and then visualized in pre-made videos. After obtaining creative elements from the daydreams of different people, the creative elements are stored in infusion bags, and then convert into different smells for masks. Immediately afterwards, this installation enables people to daydream through the interactive method of breathing, because deep breath is a way turn to daydreaming. After breathing in different smells, the visualized daydreams that people experience should all be different. As the author has repeatedly mentioned before, everyone's daydreams are unique due to personal experiences, social backgrounds, and cultural factors. In other words, no two daydreams are alike, just as there are no two people the same. However, even if two people share the same desires in their daydreams, the details and images that appear in their minds will still be different. The difference between humans and AI, or human creativity and AI's creativity, is fully manifested in these different daydreams.

The design objective of Breathe is not aimed at copying other people's daydreams but rather absorbing creative elements from other people's daydreams to facilitate everyone's own daydreams. As such, everyone can learn from his or her own daydreams using their own inspiration.

3.3.4 Concept Sketch

The concept sketch(Figure 3.7) shows the general draft of the image of Breathe, where visualized daydreams appear on the screen while the person is breathing. Smells representing creative elements are placed in a number of PVC infusions. Masks are hung under these infusion bags, but only four masks representing the four types of creative elements are placed at a height where people can reach. When people put on masks and start breathing in the smells, the videos representing visualized daydreams appear on the four screens on the wall.
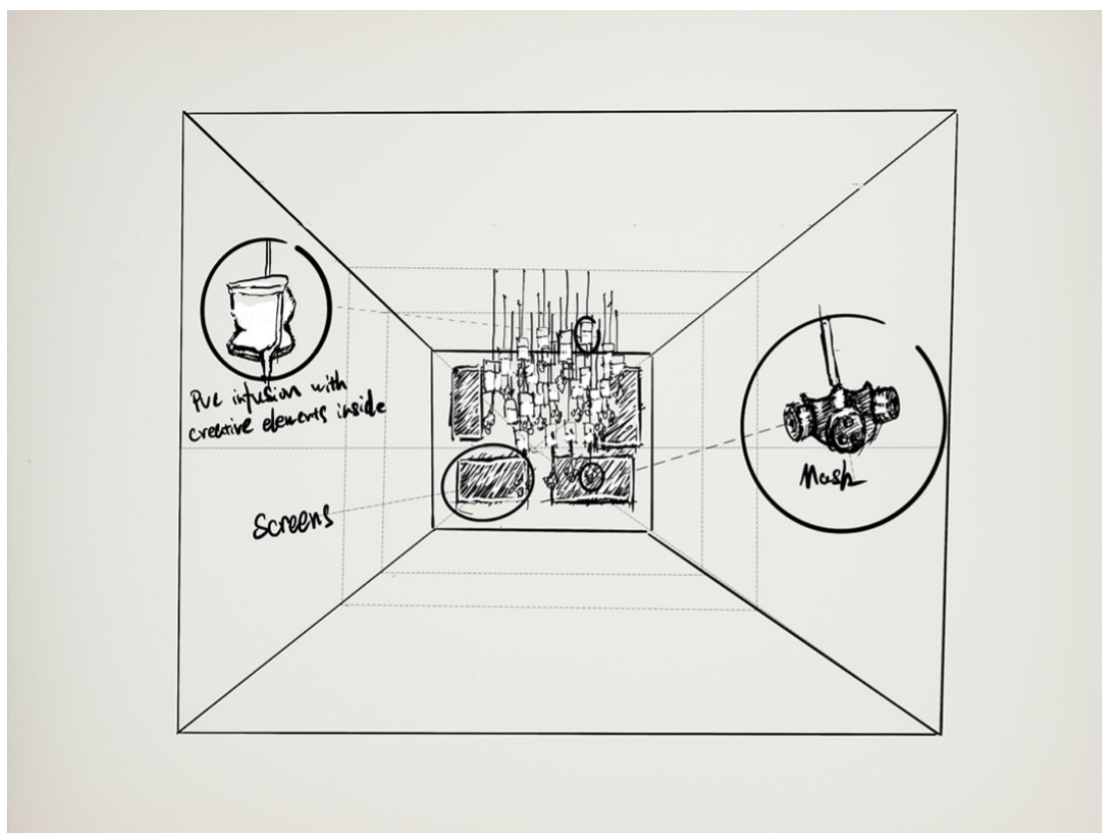
Figure 3.7 Concept Sketch

3.4. Artistic Installation Design

3.4.1 The Interactive Mask

The interactive mask(Figure 3.8) works for the concept of breathing. By breathing in the smells generated by the creative elements, people can witness the visualized daydreams according to different categories. The tube on the mask is connected to an XGZP6847A pressure sensor module. This sensor connects to the Arduino Uno. The Arduino Uno helps to collect the data captured by the pressure sensor and then sends the data for processing. Later, through coding, different amounts of pressure control the video definition played on the screen.
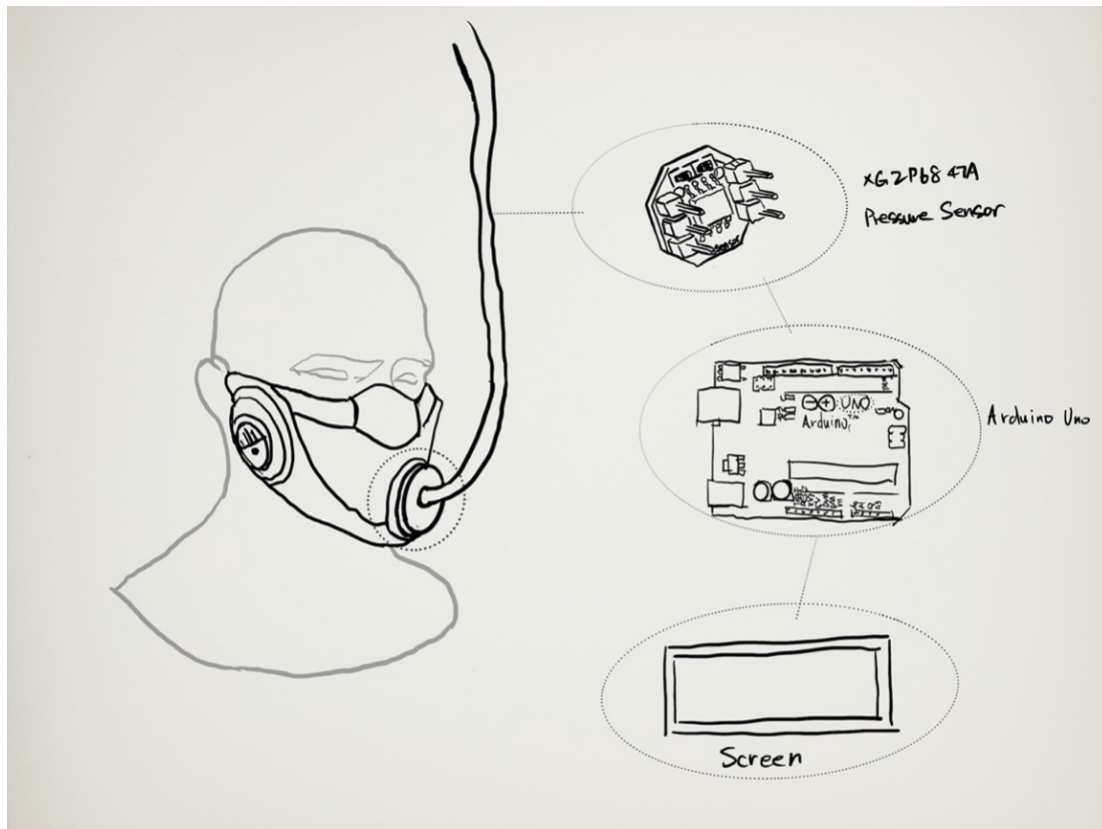
Figure 3.8 The Interactive Mask

The video is fuzzy when nobody has a mask on or when people breathe lightly.

The interaction occurs when people breathe deeply while wearing the mask, and the pixels of video shift from blurry to clear. This fact implies that deep breathing helps people to enter daydreaming. The images or parts of the video they can see marks what they captured in their daydreams.

3.4.2 Video Making Process

The video-making process is another important part of the installation design. Even though modern science cannot directly convert daydreams in the human brain into videos, in terms of speculative design the author assumes that the visualization of daydreams may be realized in the future. Simply breathing cannot really transform the ideas in the user's mind into a video. Thus, for this installation, after a preliminary questionnaire, the author extracts some creative and impressive elements of the daydreams described by the participants. These elements are then transformed into fragmented pictures, and then the pictures are spliced together. Later, storytelling is added into four different pre-made videos based on the four categories. Again, these categories are Idea Ego, Unreality, Love & Sex, Power & Wealth. Four masks then correspond to the four creative elements and four videos respectively, and then the audience can watch different daydreams after choosing one of the masks. These visualized daydreams are actually videos created by the author in advance, yet users can choose creative elements from their own will.

Furthermore, as an important part of the interaction, the depth of the user breathing controls the clarity of the videos. Since deep breathing is a method to enter a state of daydreaming, the image becomes clearer when the user breathes deeply; when the user's breathing is light and slow, the image returns to be blurred. This fact is also reflected in the difference in the user's perception of the fragments in their daydreams. The picture that becomes clearer when taking a deep breath represents the creative element that the audience captures from their daydreams. Breathe wishes to help people daydream in this way and find the parts of their daydreams that they are interested in or inspired by.

To fully understand the daydreams of different people, the author further conducted a detailed interview with 10 people. The target group of this design are human beings who may lack creativity in the future, but the main population is

younger people aged in their 20s or 30s. There are two reasons for this; first, the frequency of daydreaming decreases with age, so we daydream the most when we are children. However, young people aged in their 20s or 30s already have certain social experiences compared to children, and their thoughts have gradually matured. Compared with the older generations, younger people have many dreams for their future lives, no matter how big or small. These possibilities should allow their daydreams to have sufficient imagination and creativity. In fact, according to the author's observations, in addition to being immersed in daily working lives, young people aged in their 20s and 30s spend much their spare time browsing social media and playing online games. Very few of them notice the importance of daydreaming or its relationship with creativity. Second, people in this age group need to become more creative. Younger people are the primary productive force of society and the hope for the future in all fields. Only when these young people use their creativity can future possibilities be realized. Therefore, the author took young people with different backgrounds and experiences aged in their 20s and 30s as interview subjects.

The interviewees included five males and five females. Before the interview, the author introduced the interviewees to the definition of daydreaming and then asked them to describe in great detail a recent daydream they had. The following information explains the backgrounds and answers of the interviewees:

Interviewee 1

Gender: Female
Age: 27
Occupation: Housewife
Description of daydreaming: "I am a mother of two children. After giving birth to my first child, my body became fatter and my skin no longer tight. After giving birth to the second baby, the condition became worse. In my recent daydreams, I often fantasize about how I will lose weight and the images of myself as a young girl before. Later, my mind wanders slowly to my childhood memories. As a little girl, I would go to the amusement park and my father would take me to ride on the merry-go-round, then he would take pictures of me and buy me gifts."

Interviewee 2

Gender: Female

Age: 26

Occupation: Luxury Brand Sales

Description of daydreaming: "My family lives in a small house, and we don't have enough money to buy a bigger one. The last time I had a specific daydream was while watching a movie, there was a scene of the protagonists living in a castle. I thought about the image of myself living in a big house, imaging that the big house has a comfortable garden where I can soak up the sun. My husband was playing with a cat beside me. We had butlers, cooks, and maids working for us in that daydream."

Interviewee 3

Gender: Female

Age: 20

Occupation: Undergraduate Student Majoring in Painting

Description of daydreaming: "While painting, I thought that my work would be liked by my friends due to its uniqueness. I also assumed I would be recognized by more people when it was published on the Internet, and publishers would find me to buy its copyright at a high price. The goal was to have my paintings hung in famous galleries. Such daydreams have allowed me to get through a long creative process and paint with gusto. It can be said that this was an indispensable psychological boost for me in the process of creating artworks."

Interviewee 4

Gender: Female

Age: 23

Occupation: Graduate Student Studying Overseas

Description of daydreaming: "I liked a boy in college, but I knew that there was no possibility for me to date him, but I still could not give up right away mentally and often imagined different scenarios that he would fall in love with me. In my most recent daydream, I was feeding a stray dog at school and he passed along

the same road. He thought that I was kind and so approached me. It suddenly started raining, so he held up an umbrella for me. Then, we kissed in the rain and went home together. In my daydream, I completed the happy ending with him. This kind of daydreaming has a good motivational effect for me. I work hard to make these daydreams come true since it feels so good while daydreaming."

Interviewee 5

Gender: Female
Age: 30
Occupation: Artist
Description of daydreaming: "My daydreams are usually long. Once there was white paper on the table and I was holding a pencil in my hand. I was preparing to write a draft about ambient music. I wrote the first paragraph of the effect of water drops, and then searched for Brain Eno's work on iPhone, and inspired by his music playing at the airport to make passengers relax and relieve their fear of airplanes. Reminiscent of my experience of seasickness, I feel that musical notes can change my physiological response, and then I feel the excitement of going out to a sea, and the beauty of sea level appeared in front of my eyes. Then I jumped into the sea and turned into a drop of seawater, and I saw various sea creatures swimming around my body. Then I started to wonder if I have a body or not as one drop of seawater. Only then did I realize that I was just sitting in the room."

Interviewee 6

Gender: Male
Age: 25
Occupation: Bank Teller
Description of daydreaming: "The last time I was daydreaming was during a meeting. My superior was talking on the podium about his dissatisfaction with my recent works. I felt bored and angry because his attitude towards me had always been poor. I imagined that I was the big boss, and he was my subordinate. I thought of myself in a big office in a tall building, sitting in a large chair, drinking red wine, and looking at the scenery outside the window. At this time he came

to report to me on work, so I scolded him and fired him. He was so angry and had a fight with me, but of course I beat him up. "

Interviewee 7

Gender: Male
Age: 22
Occupation: College Student
Description of daydreaming: " I am about to graduate from university and look for a job. When I look at various company recruitment methods on the Internet, I often have repetitive daydreams. The last time I thought about finding a decent job, in that daydream I was not busy at all and my bank account balance kept rising. When I earned enough money, I left the city and went to a countryside used to be in my night dream to open a craft shop. At dusk, I was listening to music, watching the setting sun, and listening to the guests opening the door. The doorbell sounded like a beautiful but not noisy note on a calm and quiet day. I felt calm and relaxed. I even could feel the warmth of the sun shining on my body. But suddenly the ringing of the phone interrupted the daydream, and I started again to look for a job helplessly. "

Interviewee 8

Gender: Male
Age: 28
Occupation: Financial Manager
Description of daydreaming: " The last time I was daydreaming, I was sitting in the office, working on my computer with today ' s work. The wind outside the window was a bit loud, and the leaves outside were making noises. I looked at the sky outside the window and wondered why two clouds were exactly the same? Well, they were a bit different, the one on the left was a bit thicker. Where did the cloud come from? If some clouds were thick enough, could it hold the plane? No, it should not work, or how could the plane fly across them? What about the helicopter, would it break up the clouds? But the helicopter should not be able to fly this high. Then if I could touch the cloud with my hands, what would it feel like, will it be soft, or will it turn into a pool of water? Has anyone in the

world touched a cloud? Has anyone tried it but did not tell anyone else? I also want to try, but how can I do it? Am I going to fly first? If I can fly, will I do it as soon as possible? It is estimated to be very convenient to have the ability of flying, so I do not need to drive every day. But will I be arrested for research? To see why I can fly, and whether the person doing the research is a good person or a bad person. What is the distinction between good people and bad people? The computer screen flickered, so I returned to reality, looked at the work in front of me, and shook my head. ˮ

Interviewee 9

Gender: Male

Age: 24

Occupation: Undergraduate School Student

Description of daydreaming: ˮI am an Otaku and I like to read comics. The last time I was daydreaming when I was reading a comic, the protagonist was a handsome and rich man. I thought that if I suddenly win the lottery and become rich, I would take the money and go for plastic surgery. I would become a handsome guy and be surrounded by many beauties. I hung out with any woman I want and had sex with them. However, I guess in my subconsciousness, I thought that one day I would always spend all the money, and I thought that I had changed back to the way I had no money, lost everything, no job and no one liked me anymore, so I stopped daydreaming and returned to reality. ˮ

Interviewee 10

Gender: Male

Age: 24

Occupation: Graduate School Student

Description of daydreaming: "Compared to now, when I was a child, I daydreamed more often. When I was in primary school, I imagined that I suddenly grew wings and flew out of the class, or a monster suddenly broke into the classroom so that we did not have to continue the class. Also, I was often scolded by teachers to pay more attention because of daydreaming. The last time I was daydreaming was because I re-watched the movie Inception. After watching the movie, I sat on

the sofa and thought about what it would be like if I could enter other people 's dreams. The dreams should be very magical. I traveled to various magical scenes in my mind, such as a forest like Alice in Wonderland, and then I felt a little excited. That daydream lasted for a long time. After I grown up, I rarely did such a long daydream that I could recall. At that time, I felt free from the shackles of reality and lost my sense of time. When I realized that I was daydreaming, the sun has already been down. "

Interview Results

According to the interview, we can capture and categorize different creative elements from those daydreams. For example, in the daydream of Interviewee 1, the image of a younger and slimmer version of herself appears in her mind; these elements fall into the category of Ideal Ego. In the daydream of Interviewee 5, her mind wandered to the sea. She turned into one drop of seawater, and the element of "turning into a drop of seawater" fits the category of Unreality. Sometimes in one daydream there are different kinds of creative elements. In this research, these elements are categorized according to desires but not to put restrictions on what experiencers can only daydream about and instead add preferences. For example, a writer lacking creativity and ideas plans to write a romantic novel, so he will be able to choose creative elements of Love & Sex to generate his own daydreams in the future. In his daydream, he might have other desires or imaginations based on his thoughts and lived experiences. The installation serves to motivate instead of limiting creativity. The important thing is not to simply distinguish daydreams but to capture different creative elements hidden in daydreams and display them in the videos pre-made. The purpose of the interview was to look for more creative elements to visualize daydreams. The interview provided clearer pictures and more detailed stories compared with the questionnaire, so this was helpful for making videos for the prototypes later.

3.4.3 Scenario Design

As a speculative design, Breathe imagines that our lack of creativity will require finding the uniqueness of creativity in daydreams in the future. This also serves as

a warning sign that helps people to reflect on current lifestyles and understanding of daydreaming. The target audience of this artistic installation is young people in their 20s and 30s. The reason is because nowadays younger generations often ignore the importance of daydreaming. They have an over-reliance on technology, and this could lead to a lack of creativity if they continue living the same lifestyles in the future.

Storyboard

The year is 2066. In this era, human life has long been invaded by high technology. Artificial intelligence has become so similar to humans that all aspects of life now rely on AI. Compared to the past, AI is no longer just used for simple tasks but is beginning to replace human creativity. People give most of their work to AI, and they devote their spare time to social networking and various AI-derived entertainment products. Very few people daydream, think, or create. Writers rely on AI to write, painters rely on AI to draw, and music festivals rely on AI to create musical scores. Not only artists, but companies in various fields use AI to find new inspirations. Some humans are beginning to realize that the ability of human creativity is constantly being lost, and the possibility of belonging to the future of mankind is also reduced.

Lily is a twenty-five-year-old writer. She is preparing to write a new romantic novel. The plot is created by AI based on an analysis of past romance novels. Big data is obviously not enough to impress some people. Lily tries to create a script in her own mind, but she has no clue. Compared with writers from decades ago, the words she writes are so empty that nobody will be moved or touched by them. She finds that her creativity is far inferior to the past novelists. There is only a blank in her mind, so she habitually uses social networks to find ideas. However, the results are frustrating. In response, she thinks of Breathe, an installation that uses creative elements from the real daydreams of humans to stimulate one's daydreaming ability to find inspiration. Most humans in this era do not care about daydreaming and consider it as a useless thing. However, she is curious by her visualized daydreaming and wants to know what kind of inspiration can she get and what kind of story can she create.

Lily sees different creative elements being packed into the infusion bags. She

knows that these creative elements are extracted from the brains of people who still daydream. The default network, also called the daydreaming network, of these people is still developed, and they daydream in a variety of methods. These creative elements are divided into four categories. They are Ideal Ego, Unreality, Love & Sex, and Power & Wealth. Lily sees the four masks representing the four creative elements. She picks up the mask representing Love & Sex. Putting the mask on, she begins to breathe. At first, she is cautious, breathing gently; some blurred images start to appear in front of her. When she sees some of the scenes that flash by, her breathing increases. As she takes a deep breath, the image in front of her gradually becomes clearer. These images are all about love and sex, and she knows that these are her own daydreams intertwining with creative elements. In this daydream, she feels relaxed and happy like she never has before. It is as if she experienced a different life, or she had traveled to a corner of her mind that she had not noticed before. These images make her mind constantly inspired so that she finds her own creativity as a human. Taking off the mask and returning to reality, Lily realizes how happy and important it is to daydream. The creativity part of daydreaming is something she had never thought of before, so she returns home and successfully creates a romantic novel that she is satisfied with.

3.5. Concept Summary

In conclusion, Breathe is an interactive artistic installation providing an immersive experience to emphasize the relationship between daydreaming and creativity. The key interaction for the installation is between breathing and visualized daydreams. The prominent features of Breathe are:

1) Breathe builds a playful interaction between breathing and daydreaming. It helps the user notice the relationship between creativity and daydreaming. When the user breathes lightly, the video is fuzzy. When the user takes a deep breathe, the video turns to clear. The user can see what they want to observe by controlling their breathing.

2) Breathe provides an immersive experience. The creative elements inside

the infusion bags create a playground of daydreaming that people can walk through into the installation.

3) Breathe includes videos made by real daydreams according to questionnaires and interviews. These remind the user about their own daydreams and encourage them to seek something inspirational in the videos.

In addition, Breathe is not only a design that helps with people who lack creativity in the future. It is also a warning sign that causes people to reflect on their current lifestyles and attitudes toward daydreaming. The initial concept of Breathe uses testing on two prototypes. All details concerning the prototypes and user testing will be discussed in the following section.

3.6. The Initial Prototype

3.6.1 Prototype 1

Prototype 1 was a mini-exhibition hall to outline the general concept of Breathe. It was a non-functional prototype, so a user test was conducted to examine whether the appearance of the installation looks attractive and playful to people. There were two steps in making the first prototype.

Step 1: Creating the frame of the exhibition hall

Wood was used to build the frame of the exhibition hall. First, the size and outlook of the frame was identified. Afterward, the author cut the wood according to the determined sizes, and different lengths of wood were used to build the structure(Figure 3.9).

Step 2: Making the internal installation

The author used tape and PVC fabric to make mini-infusion bags, and alcohol gel was put inside these mini-infusion bags to represent creative elements. Several Lego masks were hung under these bags, while small digital screens were placed on the back wall of the exhibition hall. Prototype 1 is shown in Figure 3.10.

Figure 3.9 Finishing Step 1

Figure 3.10 Display Prototype 1

3.6.2 User Test and Results

The user test was held on May 1, 2021, to test the appearance and conceptual feasibility of the first prototype. The ten interviewees mentioned in Section 3.4.2 were invited for the user test. The author explained the concept in detail to the interviewees and investigated their responses by conducting a questionnaire. The following questions were included. The participants were required to score each criterion on a scale of 1 to 5:

- Q1: Are you interested in participating in such exhibition?

- Q2: Are you willing to introduce the installation to your friends?

- Q3: Are you willing to try all four masks that represent the four types of creative elements?

- Q4: Do you expect to see your visualized daydreams appearing on the screens?

- Q5: Do you think it is playful to have an interaction between breathing and daydreaming?

An evaluation form(Figure 3.11) was made to analyze the test results.

Participants	Q1	Q2	Q3	Q4	Q5
A	5	5	5	5	5
B	5	5	5	5	5
C	4	4	4	5	5
D	5	4	3	5	4
E	5	5	4	5	4
F	5	4	5	5	5
G	3	1	2	4	3
H	5	4	4	5	4
I	5	3	5	5	5
J	5	5	4	5	5

Figure 3.11 Evaluation Form

3.6.3 Analysis and Limitations

According to Figure 3.11, almost all the participants were interested in joining in such exhibition expect participant C and G. A short interview was conducted after the questionnaire, feedbacks including satisfactions and doubts are listed as:

Satisfactions

- The concept itself was interesting, it made people curious about what will happen.

- Most participants showed their expectations on the interaction of breathing and visualized daydreams.

- It gave a fine immersive experience surrounding by these infusion bags.

Doubts

- Participant D addressed that it was difficult to feel the playfulness by only experiencing this non-functional prototype.

- While the visualized daydreams and the interaction are the most important part in this installation, this prototype was not able to express those concepts.

- There was no direct guideline to lead people to use the four masks to breathe because there were too many identical masks hanging on the wall.

- 3 participants stated that they would have preferences on a specific type of creative elements so they would not try all of them. Another 3 participants said that they might be too lazy to repeatedly put on and take off masks, but it would depend on how playful they feel through the interaction.

- 2 participants reported difficulty seeing the screens on the back wall. They doubted if their visions would be obscured by infusion bags in the real exhibition.

The first prototype and user test pointed out the fundamental direction of the installation design. Besides proving the audiences with an immersive experience through the appearance of the exhibition, it is important to test the functional value of the design in the next prototype.

3.7. The Second Prototype

While Prototype 1 was a handmade mini exhibition hall to present the appearance of the design, Prototype 2 was a functional prototype described the interaction between breathing and the visualized daydreams. The experiment was taken on the 25th of May in Changzhou, China. This experiment invited 3 participants, 2 males and 1 female. Most of the feedbacks were positive and further proved the playfulness of the interaction and the importance of daydreaming.

3.7.1 Revision and Prototyping

The test results of the first prototype showed that the aesthetics and attractiveness of the installation in the space were successfully recognized by the participants. However, the participants remained skeptical about the interestingness of interaction and the attractiveness of daydream images. Therefore, unlike the first prototype, Prototype 2 did not emphasize the aesthetics of appearance. Its purpose was to test whether this art installation can directly establish an effective interaction between people and their daydreams through the form of breathing. There were two important components in Prototype 2, one was the interaction provided by hardware equipment, and the other was the videos representing visualized daydreams. In this section, the author will separately explain the production process of these two parts.

Building the Interaction

First of all, the interactive content of breathing was to breathing in the smells of creative elements to promote daydreaming, and the depth of breathing would affect the clarity of the visualized daydreams. Since breathing affects the air pressure in the mask, the author connected the air tube of an oxygen mask to the

pressure sensor module, and then the pressure sensor transmitted the received data to the connected Arduino Uno, and the Arduino Uno uploaded the received data to the computer, and the average pressure values in different ranges correspond to different output signals. Finally, Processing was used to map different signals to the degree of magnification of the picture, that is, the degree of blur. Through this process, the installation realized the interaction of using breathing to control the degree of blur of videos. Figure 3.12 shows the coding process.
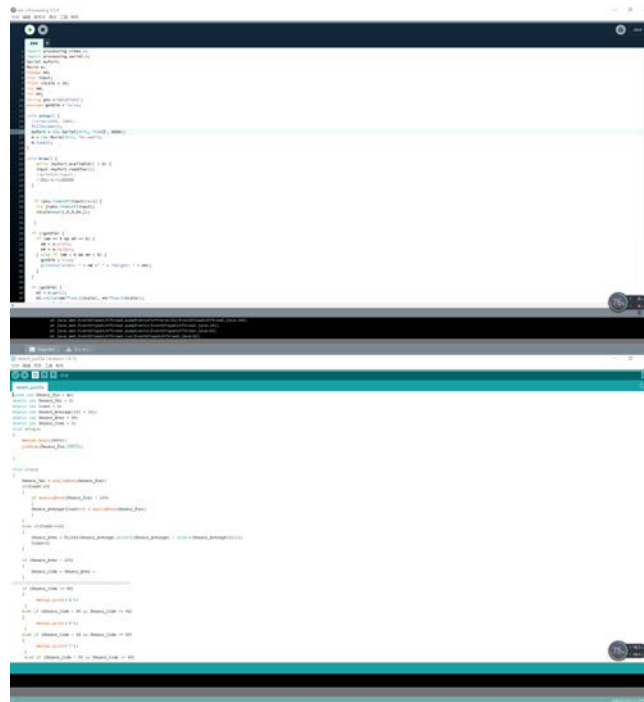
Figure 3.12 The Coding Process

Making Videos

After completing the hardware setup and programming, another important part of prototyping was the production of pre-made videos. It is worth noting that two of the participants in the experiment were also two of the interviewees mentioned in 3.4.2. Since they had already been asked to describe their impressive daydreams in advance, the author directly visualized the daydreams they had described in

the form of videos, and at the same time, added some of the creative elements of the same category collected from the questionnaire. Another participant in the experiment did not participate in the interview, so the author put together some creative elements from the questionnaire mentioned before to create a daydream inorder to see his response.

When making the video, the author collected some copyright-free materials related to the required creative elements, combined these creative elements in the daydream in the form of collages, and finally completed the production of the image using After Effects. For example, Participant 1, also as Interviewee 1 mentioned in 3.4.2, is a mother with two children. When she was pregnant and after giving birth, she often saw herself, as a little girl, sitting on a merry-go-round in her daydreams. The creative elements in her story were categorized in Ideal Ego. Figure 3.13 shows the production process of her visualized daydream.

Figure 3.13 Video 1

Participant 2 was the Interviewee 7 mentioned in 3.4.2. In his daydream, he stayed away from city life and lived in a small house in the countryside. He enjoyed the sunrise and sunset in his daydream. Creative elements in his daydream were also classified as Ideal Ego. In the questionnaire mentioned before, some people daydreams about living in the countryside just like him. Among them, cats were also creative elements that often appear in this category. Therefore, the author created such a video shown in Figure 3.14.
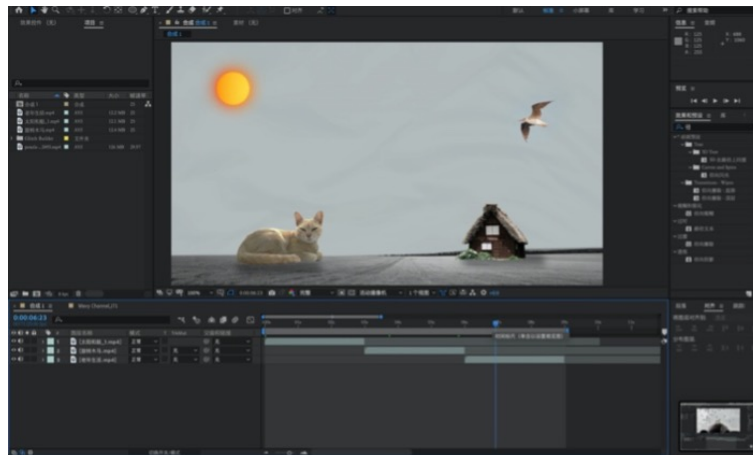
Figure 3.14 Video 2

Participant 3 did not describe his daydream to the author in advance. Since the daydreams of the other two participants were the output of creative elements under the category of Ideal Ego, the author combined some other creative elements of this category from the questionnaire to create a picture of taking a train to escape from social life(Figure 3.15), the boat heading toward the sun outside of the window represented the self who is heading toward his or her ideal life.

Figure 3.15 Video 3

These three daydreams were finally edited into one video categorized in Idea Ego and played in a loop on the installation.

Finish Prototyping

After completing the interactive part and the production of the video respectively, a sweet perfume was sprayed on the inside part of the mask to simulate the smell of creative elements. In the category of Ideal Ego, although everyone has different imaginations about their ideal self or life, this part of the daydream is always full of happiness and satisfaction, so the author thought that the smell of sweetness can better represent this creative element. Moreover, the author believes that fragrance would better guide participants to breathe in the mask. Subsequently, the author conducted the prototype test herself and invited three participants to conduct a further experiment.

Figure 3.16 shows the finalized Prototype 2 and Figure 3.17 shows author testing on the prototype.

Figure 3.16 Prototype 2

Figure 3.17 Pre-test by the Author

3.7.2 User Test and Results

The experiment accompanied with an interview was held on May 25, 2021, to test the functionality of the second prototype. Three participants were invited to conduct this experiment. Two of the participants have described their daydreams to the author in the interview mentioned in 3.4.2, while the other participant did not describe his daydream before the experiment. As a future design, Breathe cannot truly realize the visualized daydreams which were inside of participants' brains while visiting the installation due to limited scientific means currently. Therefore, instead of visualizing daydreams that should be directly motivated by creative elements, pre-made videos were played during the process and interacted with participants' breathing. In detail, this experiment had three main goals:

- By visualizing the daydreams described by the two participants in advance, the experiment was designed to detect whether the content of the video production meets the participants' own imagination, and whether the participants could capture unique creativity through their own daydreams.

- To investigate the playfulness and feasibility of the interactive installation by observing the expressions and reactions of the participants. And to further explore whether the connection between breathing and videos is an

attractive way of interaction.

- By showing the third participant who has not described the content of his daydreams in advance, a video made by a collection of creative elements was shown to determine whether the achievable installation well corresponded to the central idea. The experiment of the third participant simulated the daydreaming situation of the visitors in the actual exhibition afterwards. The purpose was to determine the playfulness of videos and the interactive installation under such circumstance, and whether Breathe can makes people notice the importance of daydreaming and find inspirations from the visualized daydreams.

After the experiment, a short interview was conducted to get more feedback from participants. The basic information of the three participants is stated in the following table(Figure 3.18).

Name	Gender	Age	Occupation
Ming	Female	27	Housewife
Yang	Male	22	College student
Sid	Male	25	Chief Executive Officer of his own company

Figure 3.18 The Basic Information of Participants

According to the results of experiment, After wearing the mask, Ming seemed a bit at a loss at first. She tried to breathe hard and found that the originally blurred image became clear. When she slowed down her breath, the image returned to a blurred state. When she realized that one of the scenes was describing her daydream, she became obviously excited, and then she kept trying to take a deep breath when this scene appeared, in order to see her daydream clearly. In the subsequent interview, Ming stated that she liked this interaction design very much, and the process of slowly exploring her daydreams while breathing was quite interesting. Especially after discovering her own daydream, the daydream

she had previously reappeared in her mind, which emphasized that the interactive installation successfully linked breathing and daydreaming together.

Compared with Ming's performance, Yang was quieter during the experiment and did not have much facial expressions. He tried a total of two experiments. For the first time, Yang did not deliberately observe his daydream with deep breaths but watched three scenes one by one while taking deep breaths. After he was told that one of the images was a daydream he had described, he was a little surprised, so he tried a second experiment. This time, like Ming, he focused on observing the part of video related to his daydream through deep breathing, and then slowly captured the various creative elements in the image. Until then, he has realized it was his daydream.

Sid's performance was the most interesting one of the three. After knowing about this concept, he showed great interest from the beginning and couldn't wait to put on the mask. During the subsequent experiment, Sid tried to see the images clearly every second by taking deep breaths, but then he said that the constant deep breathing made him feel a little dizzy. After that, he no longer deliberately controlled his breath, but slowed his breathing. Compared with the other two participants, Sid's experiment time was much longer. The author observed that in the second half of the time, his pupils were no longer focused, and it looked like he was daydreaming at that time. In the subsequent interview, Sid did confirm the author's speculation. He nodded and said, "In the beginning, after I saw three parts of the video clearly through deep breathing, I noticed a cat in one of the parts. Then I thought about my cat. She has gone to heaven, but that cat appeared in the video looked very similar to her. In addition, I remember that there was a small countryside house in the same part with that cat. I was quite busy running my company these days, so it made me fantasize about living in a place alone with no stress but only peace. Then I couldn't stop thinking that it would be so great to live with my cat in such a quiet place if she was still alive."

In general, the experiment of the second prototype successfully proved the functionality and playfulness of the installation. In the interview, all three participants admitted that they had not cared about daydreaming before, but through participating in this experiment, they found that being able to watch the visualized daydreams was a very interesting experience. Furthermore, they realized that day-

dreaming can indeed stimulate their creativity, and creative elements captured by each person through the entire video were all different. Although this prototype did not include Sid's daydream, he still said that the interaction between breathing and images was very interesting, and even the visualized daydreams formed by others creative elements inspired his mind wandering. However, the second prototype was a low-quality functional model, so there were still many shortcomings that needed to be improved in the third prototype.

3.7.3 Revisions for the Third Prototype

According to the experimental results and the short interview, limitations that needed to be revised in the next prototype are stated as follows:

- The third prototype needs to combine the aesthetics of the first prototype with the functionality of the second prototype. Since the third prototype is accompanied with a real exhibition, the space layout also needs to be improved.

- The tightness of the mask used in Prototype 2 was too poor, causing the atmospheric pressure to affect the pressure data received by the sensor. Afterwards, the mask needs to be modified so that it has a certain degree of airtightness while not making people feel uncomfortable breathing.

- The experimental results have shown that the effect of seeing a clear image required very hard breathing to produce. Therefore, to make audiences see the clear image through a normal deep breathing, programming needs to be corrected afterwards.

- As Prototype 2 only included one classified creative element which was Ideal Ego, four videos need to be completed in the third prototype. Moreover, Sid suggested that the collage method was not very suitable in this interaction, because too many elements appearing in the same picture led to a difficulty in capturing those creative elements.

- It is better to use different colors to distinguish various creative elements to attract and guide the audience in the third prototype.

Chapter 4
Proof of Concept

In Chapter 3, this research evaluated through a trail and error process with two low-fi prototypes. Breathe has carried out two user tests with the two prototypes in the previous chapter. Chapter 4 will establish the final prototype of a real exhibition accompanied with a further validation.

4.1. The Exhibition

The third prototype, which is also the final prototype of this research, was a solo exhibition held from 19th of June to the 21st of June in Huan-Tai-Hu Art City in Changzhou, China. Huan-Tai-Hu Art City is the first art city in Changzhou that integrates artistic creation, training, and cultural tourism industries with pure private capital investment. Breathe, the artistic installation solo exhibition, was held in the art exhibition hall on the south side of Huan-Tai-Hu Art City.

To accomplish the artistic installation and exhibition in high quality, several steps were carried out in the preparation stage.

4.1.1 Idea Sketch

The first prototype was a mini exhibition hall based on the concept sketch. According to the experimental results of the first prototype, the most important part for improvement lied in two points: one was that the screen on the wall might be blocked by tubes hanging under the infusion bags, and the second was that excessively hanging masks could not guide the audience well. Since the creative elements were divided into four categories and four videos were made based on these four categories, the author decided not to hang one mask under each infusion bag, but to place only four masks in the center of the artistic installation. It was

believed that such setting could better attract and guide the audience to wear the masks, and then to interact with the video through breathing. Figure 4.1 shows the idea sketch after the first revision.
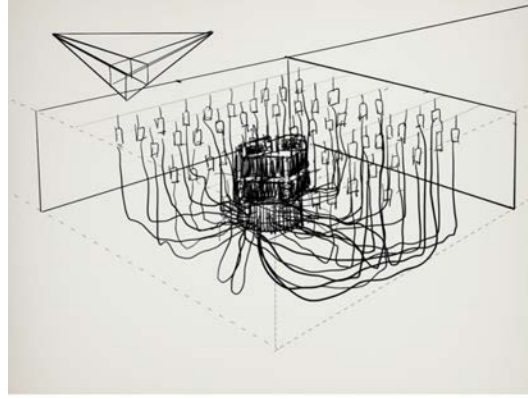

Figure 4.1 Concept Sketch Revision 1

In this idea, different creative elements in the infusion bags are piped to the central device. The audience can enter the central location, and then breathe by wearing a mask placed on the table and interact with videos displayed on surrounding screens hanging above. In order to allow the audience to move more freely in the central space, and to look up at the video without too much effort, the size of the installation is set as shown in Figure 4.2.
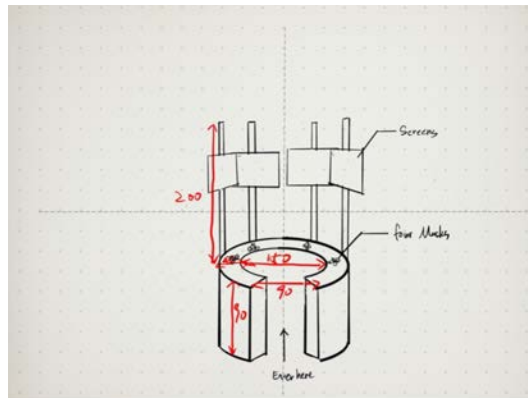

Figure 4.2 Central Installation Sizing

Unfortunately, this idea was not finally realized. The first reason was that the production of the central device requires a lot of labor and time investment. Secondly, since the size of the exhibition venue was 7 meters in length, 7 meters in width and 6 meters in height, when this device with a diameter of close to 2.5 meters was placed in the center of the venue, it appeared a bit too large. The author believed that it divided the entire space and made this space lose its sense of integrity and harmony. Therefore, the author made a second revision, and the idea sketch after the second revision is shown in Figure 4.3.
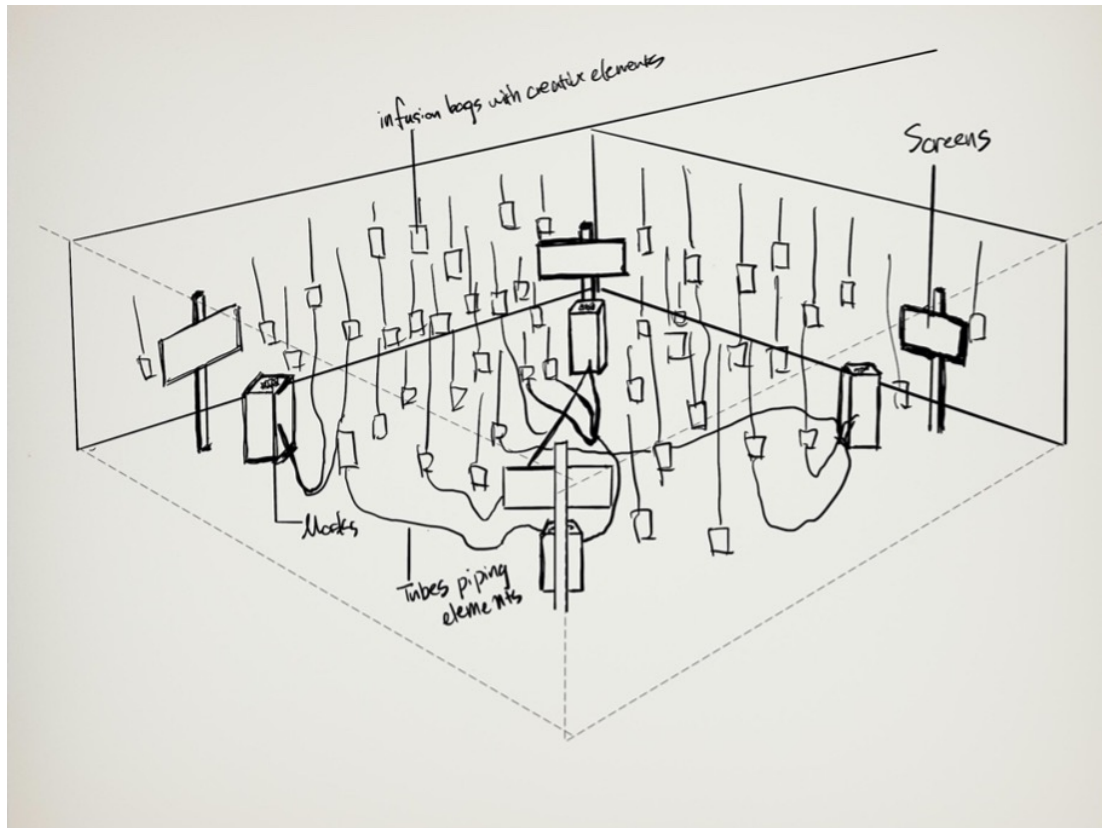

Figure 4.3 Concept Sketch Revision 2

After the second modification, four screens were placed in four directions in the space, and a display pedestal was set in front of each screen, and the four masks were placed on the display pedestals respectively. The infusion bags containing creative elements were staggered and hung around the screens, and tubes used

to transmit the creative elements to masks were connected under the infusion bags. As a gathering point of creative elements, the display pedestal played a role in conveying many creative elements of the same type into one mask. After determining the layout of the overall installation and space, the author started to make four types of creative elements.

4.1.2 Simulating Creative Elements

The creative element was also a very important part of Breathe's concept. It was delivered from the tube to the mask in the form of smells, so that people could induce different daydreams by breathing in these creative elements. Since this is a concept of future design, current technological means can neither directly extract creative elements from the human brain as a pheromone nor convert them into smells and deliver them to another person. Therefore, in this design, the author used perfumes to simulate the smells of creative elements, and then used colors to simulate the appearance of these smells to distinguish different types of creative elements.

In Prototype 2, the sweet scent was used as the smell of Ideal Ego. In the interview though, participants said that the sweet scent seems to be more suitable for the theme of love than Ideal Ego. Therefore, the author has modified this point. Also, the test result and interview of the second prototype suggested to classify creative elements based on colors, so the final prototype matched the four creative elements with four different colors.

According to the previous questionnaire, the element of the sea has appeared many times in the category of Unreality. Therefore, the author used blue to represent Unreality, and used perfume with sea salt flavor in this category. Second, nature and countryside often appeared in daydreams from the questionnaire and interview about Ideal Ego, so green represented the color of Ideal Ego and grass flavor's perfume was used. Third, many daydreams stemmed from the inner desire for love but dare not express it in Love & Sex while yellow also means timidity. Therefore, yellow represented Love & Sex, and the perfume with English pear and fressia flavor was used to generate the sweet feeling in this category. Finally, red always gives people a feeling of strong desires and passions, so red represented Power & Wealth, and a very strong flavor of a woody leather perfume was used

because men's daydreams fell into this category more than women did based on the questionnaire and interview result.

After determining the classification of colors and smells, to provide the audience with a better immersive experience, the author initially used four colors of luminous paint to simulate creative elements. After being irradiated by light for a certain period, the luminous paint will automatically glow in a dark environment, which can give people a dreamy and immersive experience. The long-lasting luminous paint can glow for 4-8 hours after being irradiated with ultraviolet light for 10-15 minutes.

In the process of experimenting whether luminous paint was feasible, the author mixed luminous paint with water and poured them into the infusion bag (Figure 4.4). The results showed that the luminous effect after mixing with water was not ideal. After that, the author purchased the luminous powder to replace the paint, then mixed the luminous powder with varnish. Its luminous effect was ideal on the first day, but after one night, the luminous powder began to settle and became turbid, so the author had to try another way.

Figure 4.4 The Process of Trying Luminous Paint

In the end, the author decided to spray the mixed paint of luminous powder and varnish on the surface of the infusion bags and tubes. The experiment proved that the luminous effect was much better than before. Next, to increase the sense of volume of the creative elements, the author added water to the infusion bags to simulate the feeling of the creative element being stored in the infusion bag. After completing the production of creative elements and hanging all the infusion bags, since the exhibition venue was a closed space that cannot be exposed to sunlight, several ultraviolet lamps were also hung among the infusion bags to "charge" the luminous powder. After being irradiated with ultraviolet lamps for five minutes, the luminous effect in the dark was shown in Figure 4.5.

Figure 4.5 Glowing Effect Taken by an iPhone

4.1.3 The Interactive Mask

According to the experimental results of Prototype 2, Prototype3 changed to a mask with better airtightness (Figure 4.6), and modified programming, so that the audience could see the clear video through a normal deep breathing.

The four creative elements were converged to four display pedestals through tubes, and then four perfumes were placed inside the four display pedestals, and the tubes and hardware connecting the mask were also placed inside the display pedestal. After the audience put on the mask, they would breathing in different

smells according to the classification of creative elements, and they would then be able to interact with the videos while breathing(Figure 4.7).
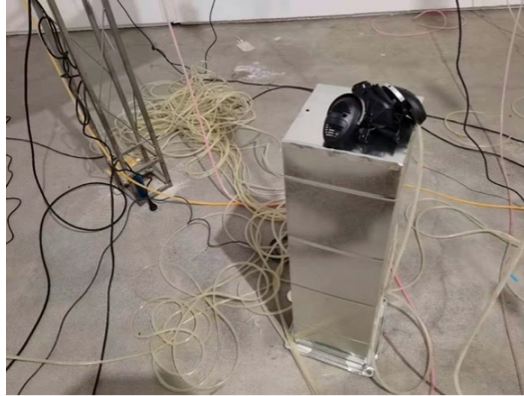

Figure 4.6 The Mask and Display Pedestal
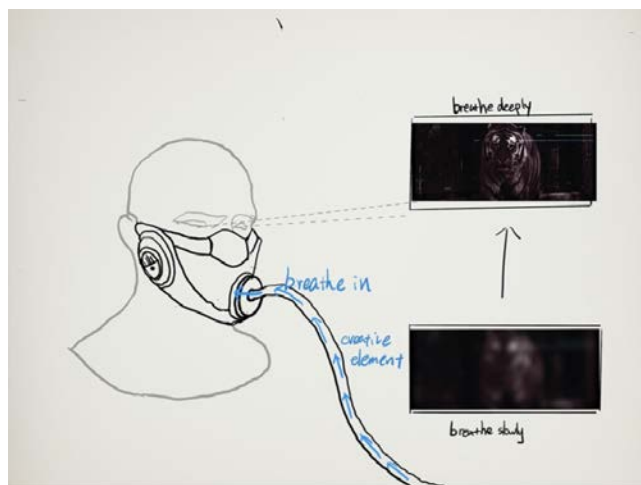

Figure 4.7 Process of Interaction

4.1.4 Visualized Daydreams

In Prototype 3, videos representing visualized daydreams were no longer made in the form of collages, but the same kind of creative elements extracted from the

previous questionnaire and interview were edited together to form a story. For example, in the category Unreality, answers stated such as "I touched the clouds", "I turned into a fish", "I had wings", and so on. Then, clouds, fish, and wings were captured as creative elements and made into the video(Figure 4.8). Each video was about ten to twenty seconds long, and materials filmed by the author and copyright-free materials were both used in the videos. The videos were made in colors according to the categorized colors of creative elements.
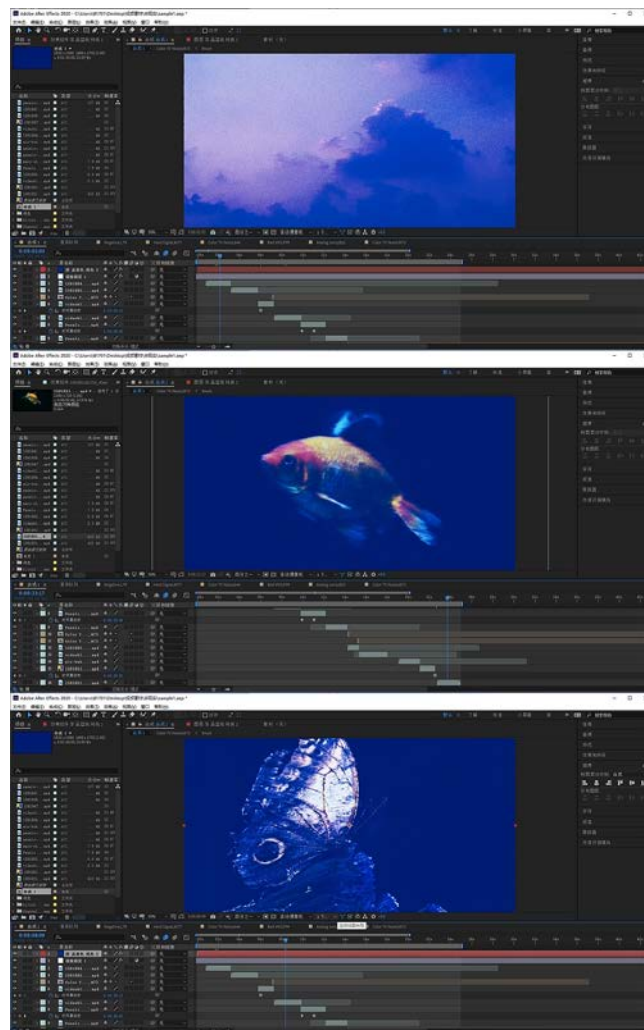
Figure 4.8 Process of Making Videos

4.1.5 Exhibition Display

The exhibition(Figure 4.9) was held from June 19th to 21st in the art exhibition hall in Huan-Tai-Hu Art City. With the project name Breathe, the solo exhibition had attracted nearly 100 people to visit. Figure 4.10 shows the exhibition when the ultraviolet lamps were turned on.Figure 4.11 is a display of the exhibition with human eyes.

Figure 4.9 Display of Exhibition Taken by a Camera

Figure 4.10 Display of Exhibition with Ultraviolet Lamps on

Figure 4.11 Display of Exhibition with Human Eyes

4.2. Interview

Four participants were picked randomly for an interview after joining the exhibi-
tion. With their consents, personal information and their pictures were recorded
and used in data analyzing in this research paper. Interview questions are stated
as follows:

- Q1: What's your name? Age? Occupation?

- Q2: Why do you come to this exhibition?

- Q3: Do you daydream frequently and what do you think of daydreaming
  before the exhibition?

- Q4: Has this exhibition changed your perception of daydreaming?

- Q5: Did you get any inspiration while interacting with the videos through
  breathing?

- Q6: Did you enjoy this exhibition? Describe one thing you liked or you did
  not like about this exhibition.

Interviewee 1

Figure 4.12 Photo of Xin and Meng

Xin is 25 years old and is an employee working in an advertising company (Figure 4.12). In the interview, he said, "I came with my girlfriend today. Actually, I was not very interested in the subject of daydreaming before. I don't daydream very much. I always feel that time passes too fast when I daydream, and that will delay my work." When asked the follow-up questions, he replied, "I originally thought exhibition on the concept of daydreaming should be a very bright space, so I was surprised at first. But the light spots of various colors have given me a feeling like various ideas are flickering in the human brain. I think it is quite beautiful. Because I work in an advertising company, I usually need to be creative in many works, sometimes I was not able to find any good ideas. I never thought about getting inspiration from my daydreams before, and I didn ' t deliberately remember what daydreams I had. This exhibition reminds me of this. I also find the interaction between breathing and videos very interesting. The overall impression of the exhibition is quite good. "

Interviewee 2

Meng is 24 years old. She is Xin ' s girlfriend and also an international student studying in the US. In the interview, she answered, "I am a student majored

in fashion management. This time I returned from the US to China because of COVID-19. I saw the introduction of this exhibition on the public account on Wechat. It is in line with my own ideas, so I am very interested. I think that people who do not daydream can be understood as lack of imagination. Imagination is an opportunity to push people to find many possibilities. If you do not extend existing things or stop exploring, the future will be no value at all. Daydreaming is a sign of people's sensibility, a grasp and prediction of the future, and a subjective simulation of the development possibilities of various existing things. It also has a great influence on creativity. I usually daydream very often, but not for long. This exhibition fits my own ideas very well, so I enjoyed a lot. I secretly observed what pictures became clear when someone else took a deep breath and found that the clear picture that each person captured was quite different. I like this point very much. What's interesting was that my boyfriend took a deep breath when a woman's body was just shown in the picture, in order to see that picture clearly." At this point, she and Xin both laughed, and then she said, "Many elements appearing in the videos reminds me of my own daydreams, and the use of different smells makes me feel the concept of daydreaming better. These two parts are my favorite parts."

Interviewee 3

Figure 4.13 Photo of Jun

Jun is a 21-year-old male and a college student(Figure 4.13). In the interview, he said, "I came with a friend. I have no idea about daydreams. If it doesn't affect personal lives, it is just a normal thing. At first, I was sure that I did not understand the connection between this space and daydreams. It's probably because I don't have any artistic cells. But the videos, especially the blue one with some dreamy images fit the theme of daydreaming quite well. I remember in that video, a person who jumped into the water. Then the next picture shows a fish swimming. That part is my favorite, because I remember that I had a daydream, that is, my thoughts diverged, and then I thought of myself becoming a fish. I now think if I can use the ideas appeared in my daydreams into creations should be quite interesting."

Interviewee 4

Figure 4.14 Photo of Haidi

Haidi is a 28-year-old female who runs her own nail salon(Figure 4.14). In the interview, she replied, "I like to visit various exhibitions. This time I heard from my friends that this exhibition is very beautiful and suitable for taking pictures, so I came here. I daydream frequently. All girls love fantasy, right? But sometimes daydreaming can bring me a guilty feeling that I am trying to escape from the reality. This exhibition makes me feel that there are so many colorful images and inspirations in daydreaming, then it might not be a bad thing, so it eliminates

my guilt when daydreaming. My favorite place is the infusion bags of various colors in this space. It feels like looking at the stars. The exhibition itself is like a daydream. What I don't like is that after I arrived at the venue, I waited for a while to enter, and I do not know why."

4.3. Feedback Summary

From the observation and interview, the results of this exhibition were summarized with keywords as below:

- Immersive: This exhibition successfully brought people an immersive experience. Some people said that the infusion bags hanging in the space were like colorful stars, while some other said that the infusion bags looked like butterflies.

- Understanding: Through this exhibition, people had a better understanding of the concept of daydreaming. According to interview, some visitors shared a similar idea with the author.

- Reflection: Some visitors did not care about daydreaming at first, but through this installation and exhibition, they could better feel the creativity in daydreaming.

- Playful: The interaction between breathing and visualized daydreams was considered by most people to be interesting and brought them with a novel experience.

Chapter 5
Conclusion

Busy lives, over-reliance on technology, and the prospects for the development of AI will bring a crisis to human creativity. Breathe, as a future design, helps people who lack creativity and imagination to find the unique creativity of mankind from daydreams. According to the experimental results of the final prototype, people have better realized the importance of daydreaming through Breathe, thus reflecting on the original lifestyle. However, it is not a one-off art installation, but brings the theme of daydreaming to the public eye, paving the way for a long-term research on daydreaming in the future. This chapter will elaborate on three limitations of the final exhibition and three fields of future works.

5.1. Limitations

The Glowing Effect

Although the luminous powder generated a good glowing effect, its duration of glowing was much shorter than expected. Because it is danger for human body to be exposed to ultraviolet light, sometimes it was necessary to temporarily close the exhibition for 10 minutes when there were no visitors and to turn on the ultraviolet lamps during this period to "charge" the luminous powder. When visitors came during the "charging" process, the situation was a little embarrassing. This explains why Haidi had to wait outside the exhibition room for a while. Furthermore, due to the brightness of the screens on which the videos were played, the glowing effect was reduced.

The Visualized Daydreams

In the video of Power & Wealth, there were parts that were not liked by the participants. During the exhibition, several participants said that other videos have brought them dreamy and imaginative daydreams, but the content of Power & Wealth seemed a little gloomy, and the interaction with that video was not very playful for them.

The Invitation of The Target Group

The significance of Breathe is to help people realize the importance of daydreaming and its connection with the unique creativity of human beings. Not only artists, but everyone should also re-recognize daydreaming and learn to find own creativity in daydreams especially young generations. However, many of the visitors came to the exhibition were those who have been interested in the topic of daydreaming or artists. Although some visitors came with friends who have been interested in daydreaming could be counted in the target group, there was still an insufficiency in attracting the target group.

5.2. Future Work

Series of Artistic Installations about Daydreaming

In chapter 2, related works have shown that many artists are working on promoting creativity through artist installations. However, the artistic installation that connects daydreaming with creativity is still a new topic waiting for people to discover. Currently, Breathe, as a speculative design, transforms the creative elements of daydreams into smells and allows people to interact with the visualized daydreams through breathing. In the future, Breathe will develop into a series of art installations in more forms about daydreaming, reminding people not to ignore the benefits of daydreaming.

Sense of Identity

The thoughts and images generated in daydreams mainly comes from our subconsciousness. Therefore, daydreaming can help us better understand ourselves

and enhance our sense of identity. Breathe finds our unique creativity as human beings in daydreams. We create different daydreams according to different backgrounds and lived experiences, thus daydreaming helps us identify who we are. In future research, Breathe can not only help people improve their creativity through daydreaming, but also allow people to explore their inner thoughts and find the truest self.

Open Platform

The purpose of the open platform is to enable more and more people to realize the importance of daydreaming and to capture creative elements from daydreams. Originally daydreaming was a private act. Nevertheless, on an open platform, the masses can record and share their daydreams to the public. From various daydreams, people can be inspired, and creativity can be improved. These data will be recorded and uploaded to Breathe, and the creative elements in future installations will be more than just four categories. Furthermore, the research on daydreams currently has great limitations. The open platform can help us obtain a large amount of data to conduct more in-depth researches on daydreaming in order to create a better future.

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Appendices

A. Example of Fault Detection Configuration File

Configuration File for Detecting Failures

```
<config>
<system>
<class>DefaultCompareClass</class>
</system>
<evaluate>
<compare_single_observation_point>
<function method="compareMax" recital="Temperature maximum threshold value"
type="Temperature"> <argument class="double">40.8</argument>
</function>
<function method="compareMin" recital="Temperature minimum threshold value"
type="Temperature"> <argument class="double">-41.0</argument>
</function>

<function method="compareChange" recital="Temperature change amount error"
type="Temperature"> <argument class="double">17.0</argument>
<argument class="int">1</argument>
</function>

<function method="compareConstant" recital="Temperature constant error"
type="Temperature"> <argument class="int">1</argument>
</function>
</compare_single_observation_point>

<compare_neighbor>
<function method="compareNeighbor" recital="Temperature neibor error"
```

```
type="Temperature"> <argument class="double">2.0</argument>
</function>
</compare_neighbor>


<compare_wide_area>
<function method="compareWide" recital="RainFall wide area error"
type="RainFall"> <argument class="double">10.0</argument>
</function>
</compare_wide_area>
</evaluate>
</config>
```