Time Composed by Data

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Data

Ordinarily, the opening of an art exhibition indicates the completion of an artist's work in preparation for the exhibition. The time leading up to the opening is time in which the artist creates the artwork, and the opening is regarded as the end of this creative activity. In the 2020 exhibition *Time in Ignorance*, however, GRAYCODE and jiiiiin instead used the opening to mark the starting point of their work, arranging the frequency of the sound that was created at the opening concert to gradually diminish until it finally vanishes from the human spectrum of hearing. Similarly, in their latest exhibition, the opening of the exhibition is not the end but the start of their work, as evident in the exhibition guide placed at the entrance that divides their project into three sections of A, B, C. While Sections A and B are titled "Data Composition -1" and "50 Days Exhibition," the title of the exhibition, "Data Composition," is actually assigned to Section C. Why was this single exhibition divided into three sections? The answer is related to data, the core keyword of *Data Composition*.

In The Mathematical Theory of Communication (MTC), a founding work for today's information theory, Claude Shannon proposed a method to quantitatively express information through the extent of the reduction of the "data deficit." For example, one might decide whether to receive a medical check-up this year by flipping a coin, assigning "Yes" to the head and "No" to the tail. Until the person who chose this decision system actually flips a coin, there is a deficit of data required for the decision, which can only be completed with the data collected from the flip of the coin. As such, the "-1" in "Data Composition -1" implies that the system for the exhibition is

prepared, but the key data is lacking, wherein "50 Days Exhibition" is dedicated to the collection of the said absent data. As such, the exhibition Data *Composition* is designed to be completed upon inputting the data collected over the course of 50 days. Therefore, the exhibition that opened on January 15, 2021 at Sejong Museum of Art 2 comprises only one-third of the entire Data *Composition* project. Visitors to the exhibition are placed in Section B and become providers of data required for the completion of the exhibition. Poetically expressed in the exhibition leaflet as "The time spent here by each of you will be a stitch in the piece of musical embroidery by GREYCODE and jiiiiin," the process of completing the exhibition is extremely mathematical. Accessing the website (dc.seoul.kr) given by the docent at the exhibition allows the website to quantify your IP address as well as how much time you spent in which section. Ultimately, the data collected during the course of the exhibition is used to fill the data deficit of

"Data Composition -1" in order to ultimately complete *Data Composition*.

Is this a form of "participation art?" Absolutely not. In this exhibition, viewers do not participate in the artwork semantically. In information theory, what matters is not the semantics of data or information; no matter what you decide on-whether to receive a medical check-up, whom to marry, or which smartphone model to buy-everything is converted into a certain quantity of information. Here, the important matter is not the meaning or value that you derive from the information, but the reduction of probability or possibility that can be numerically calculated. While participation art provides viewers with the experience of engaging in artwork and attribute the creation of artwork not to a single individual but collectively to numerous viewers, Data Composition does not incorporate viewers' feelings and experiences of the

exhibition as data required for the completion of the exhibition.

What meaning does it hold then to create art using only the data generated and collected from the time spent by viewers to access the website? Answering this question calls for contemplation on the status of data and information in today's world. Searching for information on web search engines, purchasing goods on online malls, and ordering food on online platforms using a credit card have naturally become a part of our daily lives, as well as "liking" or "sharing" posts or leaving comments on Facebook, Twitter, or Instagram, scanning QR codes with smartphones to check-in somewhere, visiting gourmet restaurants based on web search results, subscribing to Netflix or YouTube channels, and watching YouTube videos on autoplay mode. Indeed, we are connected to various networks for nearly half of the 24 hours in a day. Every little thing that we do online while we are connected to

a network, whether we recognize it or not, constantly generates data. Devices such as smartwatches even record our physical activities such as daily steps and sleeping hours as well as physiological indicators such as blood pressure or heart rates and turn them into data. We are aware that this collection of data is "changing the meaning of labor, boundaries, and social structures at this very moment and creating its own reality." This excerpt from the artists' notes for Data Composition is by no means an exaggeration. Derived from our daily lives and activities, this data becomes the basis for governments to promote their policies, political parties to customize their campaigns according to the characteristics of each voter group, and companies to develop their marketing strategies and release advertisements tailored for consumption trends. Luciano Floridi pointed out that today's world has turned into an "infosphere,1" where we consider the space of information to be synonymous with reality. The world we live in is composed of data produced from our lives and activities, and the feedback loop where such data is conversely used to regulate our lives and activities. Converting visits to an art exhibition into data and feeding them back as a sound piece does not represent a particularly significant act in itself to us, as we already live in the infosphere. Rather, *Data Composition* is merely modelling our present situation itself in the form of an exhibition.

Modelling instead of representation

At this point, the distinctive aspect of GRAYCODE and jiiiiin's creative method becomes apparent; to these artists, art is not representation. Through their exhibition, they model a certain process with which we are associated but nonetheless are not able to detect.

¹ Luciano Floridi, Information: A Very Short Introduction, Oxford University Press, 2010.

While *Time in Ignorance* presented the 720-hour compressed version of the process of the transition towards the thermodynamic equilibrium that is constantly happening in the physical world yet out of our perception, Data Composition focuses on the process through which the time that we live in is converted into data and fed back to us. What is the definitive nature of this form of art? The concept of "representation," which has long defined art, is premised on a firm boundary that separates art from the actual world. The idea that what we find in artwork is not the reality but its copy or representation has historically been the fundamental condition for the creation and appreciation of art. Contemporary art has made various attempts to escape from this frame of representation, such as happenings that actively create or stimulate an event instead of merely representing it, and durational art that demonstrates the actual time in which the event occurs rather than representing it in a compressed form. Nonetheless, not even happenings or durational art can capture an event or process at a scale that far exceeds the human lifespan, such as the birth of the universe through the Big Bang about 14 billion years ago or the dissipation of the order of energy in the physical world—events that transcend the scope of human experience and thereby dubbed the "absolute reality" by Quentin Meillassoux. We demonstrate these events using representations such as symbols or artificial signs. For example, science documentaries represent the Big Bang, neurons exchanging electrical signals, or the curvature of space-time in the universe through computer graphics. Strictly speaking, however, what they convey is not the actual process itself but merely its "virtual representation."

No stranger to computers and programming, GRAYCODE and jiiiiin refrain from using digital devices for the mere "virtual representation" of an event. Upon entering through the curtains at the entrance of *on illusion of time*, one is surrounded by the massive bundle of light rays generated by eight DLP projectors within a space 2.4 meters high and 16 meters wide. Three speakers each installed on both the left and right sides of the space emit sounds at two different frequencies, 39.4 and 61.0 Hz, which means that the signal from the left is repeated 39.4 times a second, while the signal from the right repeats 61 times per second. At the spot where the visitor stands, these different frequencies clash against each other and modulate through mutual interference. The Moiré patterns projected on the walls on both sides are also the product of the interference between the lights emanating from each side. Here, what the viewers see and hear is not the symbolic or virtual representation of the interference between lights and sounds, but the actual phenomenon of interference occurring at that very moment. As the body of the viewer moves in the midst of the interference, the sounds and lights undergo subtle changes.

It is incorrect to describe on illusion of time as an "interactive" artwork, simply because movements of the viewers can cause change in the piece. Interactive works generally utilize movement sensors and audiovisual elements that change with much clearer causation by such movements, aiming to directly intrigue the viewers. In contrast, on illusion of time does not use any sensor that confirms to the viewers that their movements are contributing to changes in the work, because its intent is not to convey a certain audiovisual effect generated through the viewers' movements. Interactive media works that capture movements using sensors and change accordingly tend to incur a certain loss, and on illusion of time focuses on this loss. For example, the sound of someone sweeping snow outside my window passes through the media of the window glass and air to resonate with my eardrums and interferes with the sound of my fingers typing on the keyboard. This event is not expressed in a concrete and perceivable form since there is no

sensor or amplifier, but it is clearly happening in the actual physical time and space around us. The fact that the presence of viewers affects the sound interference in the space of *On Illusion of Time* is subtly perceptible only by the modulation caused when viewers speak. This is not the virtual representation of the sound or light interference, but proof that the field of such interference is being created.

Time

Of all the events that are hard for us to detect but are nonetheless constantly happening, could anything be subtler and more difficult to capture than time itself? The artists have been interested in time as the theme of their works since their first exhibition, *Time in Ignorance*. In their latest exhibition, time is once again the core subject of their work. In the title of the piece, *on illusion of* time, and the Einstein quote written on the wall at the exhibition venue, which reads "People like us who believe in physics know that the distinction between past, present and future is only a stubbornly persistent illusion," the word "time" appears alongside the word "illusion." The Einstein quote is criticizing Newton's notion of "absolute time" that still rules over the general concept of time today. To Einstein, who theorized that time can bend or expand depending on the existence of matter in the universe and changes in such matter, and that the disappearance of matter would also mean the disappearance of time, the Newtonian concept of absolute time—time that flows equably and at the same speed in every part in the universe, regardless of matter or material changes, and follows the clear causal order between the before and the after, and the past and the future²—represents nothing but an "illusion."

² "Absolute, true, and mathematical time, of itself, and from its own nature, flows equably without relation to anything external, and by another name is called duration: relative, apparent, and common time, is some sensible and external (whether accurate or unequable) measure of duration by the means of motion, which is commonly used instead of true time; such as an hour, a day, a month, a year," https://plato.stanford.edu/entries/newton-stm/scholium.html.

In Data Composition, however, the word "illusion" is not only juxtaposed against Newton's concept of time. Einstein also remarked on time: "When you sit with a nice girl for two hours, you think it's only a minute. But when you sit on a hot stove for a minute, you think it's two hours. That's relativity.³" Through this remark, Einstein seems to claim that time is similar to a subjective feeling towards each situation. Is it valid to understand time in this way, even if the concept of absolute time is an illusion? The answer might be found in Kant, whose works were enjoyed by Einstein. In Critique of Pure Reason, Kant provided a truly intricate answer to the question: Is time objective or subjective? According to Kant, time is an a priori form of inner sense. Time is like a filter that one must penetrate through to experience, a pair of *a priori* sunglasses only through which one can see and experience the world. In the sense that one cannot experience anything at all without passing through time, time is the absolute condition of our every experience. This does not mean, however, that time "objectively" exists beyond our experience. The point is that, though we cannot experience time itself, our every experience occurs within (the *a priori* form of) time. Despite the differences between their views on time⁴, Kant and Einstein both certainly considered time as not independent from objects and matter or our experience⁵ of them.

When we say we "experience time," we do not actually experience time itself, but changes in things such as the moving hands of a clock, changing display of numbers on a digital clock, or

³ https://www.br.de/fernsehen/ard-alpha/programmkalender/sendung-1315134.html.

⁴ According to Einstein, time disappears along with matter; Kant sees time as in its *a priori* form that exists without matter that can be experienced. See https://www.menscheinstein.de/biografie/biografie/biografie_jsp/key=2414.html.

⁵ The space of matter in the universe, as explained by Einstein, is not something we can experience in person.

growing fingernails or hair. Still, we perceive time as an inner sensation created as we imbue a sense of continuity to the changes or movements of things we experience. To stretch this notion, we could even call it an "illusion." GRAYCODE and jiiiiin's now slice demonstrates this aspect of time. In the piece, a display with a diameter of over a meter shows luminescent particles seemingly floating in a disorderly array in space or the deep sea. The video image is presented at the speed of one frame per second in a disjointed way, like video footages sent from a Mars rover back to Earth. Watching such videos, we think that each frame that we are watching "now" is a "slice" cut from the continuity of time, presuming that a certain change or movement is continuing to happen "between" each frame and the next, though we cannot actually see it. In this manner, the continuity that we attach to the invisible gaps

"between" the changes of matter and objects creates an inner sensation that we consider to be time. Strictly speaking, we cannot perceive the change or movement in matter and objects within the frame of such continuity. When we glance at a bonfire once every five minutes, the fire that we are seeing now is different from the fire that we will see after five minutes has passed. Whether the flame has become bigger or smaller, we assign continuity to what occurred "between" those changes and say that "time has passed." What if, instead, we continue to look at the bonfire without looking away? We may be able to trace changes that can be perceived, but we cannot capture all of the microscopic changes that happen in the blink of an eye or during the oxidation of matter. What we see, instead, is the series of discontinuous images that represent the changes of the bonfire.

Time is what we construct to make such images appear to be continuous⁶.

Data as anti-entropy

The exhibition presents another saying related to time: "Time was, is, and will be." It is quite different from the Einstein quote in its context. When it is already understood that time is an illusion, what does it mean to say that time was, is, and will be? Does it indicate that, like those who believe the earth is flat, the illusion of absolute time exists now, existed before, and will continue to exist? Personally, it seems that this saying is related to the concept of entropy, on which the artists' previous exhibition was centered. Since the birth of the universe, the only direction—if there is any—that has led the system of the universe is the constant increase of entropy. The unequal distribution of thermal energy caused by the creation of the universe as an orderly system inevitably pushes the world towards thermodynamic equilibrium, as with hot water left at room temperature becoming cold without additional heat and ice cubes dissolving in water. In *What is Life*, Schrödinger explains this phenomenon as follows:

When a system that is not alive is isolated or placed in a uniform environment, all motion usually comes to a standstill very soon as a result of various kinds of friction; differences of electric or chemical potential are equalized, substances which tend to form a chemical compound do so, temperature becomes uniform by heat conduction. After that, the whole system fades away into a dead, inert lump of matter. A permanent state is reached, in

⁶ On the aforementioned perception and construction of time, see Römer, Inga & Bernet, Rudolf & Taminiaux, J. & IJsseling, S. & Leonardy, H. & Lories, D. & Melle, Ullrich & Bernasconi, R. & Carr, D. & Casey, E.S. & Cobb-Stevens, R. & Courtine, J.F. & Dastur, F. & Düsing, K. & Hart, J. & Held, K. & Kaehler, K.E. & Lohmar, D. & McKenna, W.R. & Waldenfels, B. (2010). Husserl – *Zeitbewusstsein und Zeitkonstitution*. 10.1007/978-90-481-8590-0_2.

which no observable events occur. The physicist calls this the state of thermodynamic equilibrium, or of "maximum entropy.⁷"

Unlike ordinary matter, however, living organisms can, despite existing within the process of reaching maximum entropy, "maintain itself on a stationary and fairly low entropy level," according to Schrödinger. How can living organisms, which are ultimately composed of matter, maintain their life (order) against the natural law of entropy that continues to expand and dominates the entire material world? Schrödinger discover the answer in genetic materials that enable living organisms to sustain themselves with enough strength to "evade the tendency to disorder.8" Information theorist Floridi describes this notion as follows:

Biological life is a constant struggle against thermodynamic entropy. A living system is any anti-entropic informational entity, i.e., an informational object capable of instantiating procedural interactions (it embodies information-processing operations) in order to maintain its existence and/or reproduce itself (metabolism)⁹.

Every form of life, including human beings, is an anti-entropic informational agent in that it extracts and responds to information from the environment in order to survive. What we do to sustain life—eating, sleeping, avoiding being hurt, striving to be healthy, obtaining information needed for our survival and life from the environment, and responding properly to such information, or in other words, the entirety of our

⁷ Schrödinger, What is Life?, Cambridge University Press, 1944, p70.

⁸ chrödinger, What is Life?, Cambridge University Press, 1944, p70.

⁹ Luciano Floridi, Information: A Very Short Introduction, Oxford University Press, 2010.

life itself—is a constant struggle against the increase of entropy. In this regard, today's information society, where all of our actions and physiological signs are converted into data, embodies a kind of duality; it entails the possibility for a dystopian future where everything in our life is tightly controlled under information networks, while it is simultaneously resisting the increase of entropy by "organizing" our actions and lives as information that might otherwise have simply become lost to thermodynamic equilibrium. Information technology such as big data or artificial intelligence might be able to convert carbon emissions and plastic waste that are recklessly discharged by human beings into systemized information. For example, the international carbon credit system, which was devised to reduce greenhouse gas emissions across the world, is based on data technology that can measure and calculate the amount of CO2 discharged by each country. Could it be that the

trend of converting human life into data presents at least a minute clue for a world that is currently facing an ecological crisis? Time Composed by Data Namsee Kim 2021

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