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ETHICAL DISCUSSION ON THE IDENTITY OF DIGITAL HUMAN IN THE METAVERSE ERA

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As the metaverse, recognized for its potential in various fields, grows, the technologies associated with it also develop. Therefore, this study intends to explore the ethical implications of Digital Human technology, one of the core technologies of the metaverse era. First, it examines how the concept of Digital Human is being established, what are the research trends, and how it relates to the metaverse. Second, the essential characteristics of the Digital Human are divided into four categories: 1) Digital Double, 2) Digital Single, 3) Digital Subject, and 4) Digital Object, according to ground and identity, and based on facts and non-facts. In addition, the ADVISE model is proposed as an ethical assessment model based on six major ethical standards (-falsity, discrimination, violence, invasion of privacy, sexuality, and dependence) in relation to Digital Human.

1. Introduction

Facebook, one of the companies that led the golden age of social media platforms at the beginning of the 21st century, changed its name from 'Facebook' to 'Meta' at the end of October 2021. In this regard, Mark Zuckerberg, CEO of Meta, expressed strong anticipation and special confidence in Metaverse in his keynote speech at the company's major annual conference, 'Facebook Connect 2021'. In particular, Meta is currently building the metaverse platform ‘Horizon’, which consists of three main spaces. Moreover, such an image transformation of a socially-led company has become an amplifier of interest in the 'Metaverse' along with related industries.

This expansion of the metaverse market is not simply a monopoly of a single company, but an innovative movement flowing at the bottom of the high-tech ICT industry. Furthermore, a huge impact affects a whole society, including economy, politics, and education, by exceeding the boundaries of industrial fields. Mainly, representative platforms such as Roblox, Zepeto, and ifland operate events, for example fan signing events for singers, conferences and forums of government agencies and companies, and the scope of application is expected to gradually expand.

Among other things, the expandability of Metaverse is maximized by the application of artificial intelligence (AI) technology to realize its potential. In particular, the main focus is Digital Human or virtual human using technologies such as deep learning or communication AI. It seems that interest in robots, AI, and metaverse boils down to 'how can a human or the human world be most realistically implemented'. ‘Oh Rozy’, a fictional character of ‘Sidus Studio X’, a content creative company, has already generated about 1 billion won in revenue in 2021 alone. Also, a number of virtual human cases such as ‘Sua’ from Onmind and girl group ‘Eternity’

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from Pulse9 have recently appeared. This AI-based Digital Human technology can be used as an avatar of the metaverse, so it can greatly contribute to the detailed realization of the metaverse.

Therefore, this study explores the possibility of a democratic expansion of the Digital Human. As this point, a question arises as to how to assess the identity of Digital Human located between humans and machines. Here, classifying them according to whether they are true or not takes identity and ground as the main reference points. Additionally, when diagnosing the democratic applicability of Digital Human, an ethical assessment model is presented so that the limitations and tasks can be analyzed together. After introducing the discussion of identity and ethical considerations, it predicts what role Digital Human can play in a democratic society as they advance technologically in the future. In addition, it is intended to lay the foundation for the ethical development of Digital Human by examining the ethical issues and proposing future tasks.

2. Digital Human Identity Discussion

2.1. *Concept and Development Direction of Digital Human*

As Homo Faber, the instrumental and technological expertise of human being has now focused its attention on the representation of human being or their world, starting with the primary use of natural materials. The concept of Homo sapiens, which had led Homo Faber, is no longer leading the production of its meaning, but rather a reversal that the meaning of Homo sapiens is defined by Homo Faber is occurring. The future of modern ICT technology is condensed into Reality (R), which is the limit of representation. This is revealed by the development of reality-based technologies such as VR (Virtual Reality), AR (Augmented Reality), DR (Diminished Reality), MR (Mixed Reality), and XR (eXtended Reality). Additionally, reality digital devices such as VR HMDs like Meta's Oculus Quest and Microsoft's HoloLens, and AR devices are also developing as a means to support the reality-based technologies. Accordingly, the provisional layers or areas (of multiple mixed reality and virtual) that exist infinitely between the perfect reality and the perfect virtuality exist variously and overlappingly between Augmented Virtuality (AV) and Augmented Reality. [Figure 1] shows the spectrum of such virtual and reality. Virtuality can be divided into surrealistic virtuality and realistic virtuality, then AV comes from the latter. The overlapping phenomenon between reality and virtuality intensifies in Hyperreality where AV, which adds reality to realistic virtuality, pursues extreme reality, or where AR, which adds realism to reality, becomes overly realistic. In conclusion, virtuality and reality, which were located in opposite concepts, are each augmented and connected as one, forming a new world. In this paper, this is called 'HYPERREALITY'.

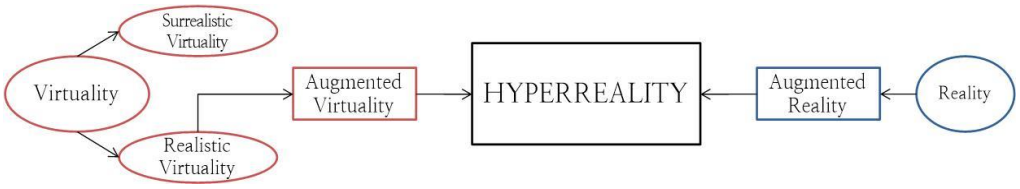


Figure 1. The spectrum of virtuality and real.

Meanwhile, a key issue in the process of world construction in virtual space is how to implement a virtual human closer to a more perfect reality by actively utilizing the developing

technologies. In an issue report of the Software Policy Research Institute, Seung-Hwan Lee and Sang-Yeol Han predict the future through the spread of Metaverse and identify the five major issues related to Metaverse as "① Beyond Game, Toward Economy ② Expanding Metaverse Devices ③ Growing Digital Human ④ IP x Metaverse ⑤ NFT x Metaverse" [1]. When discussing the growth of Digital Human among the five issues, they revealed that Digital Human is being used in various fields as "technological constraints are relaxed" and AI is applied [1]. This rapidly emerging Digital Human implementation technology is expected to make a important contribution to the final position of the metaverse, a virtual expansion of the human world.

The concept of Digital Human is still being actively studied, and only the initial concept in the company has been established, and related research is still in its early stages. Looking at the discussions of companies, first, Virtuals, a virtual production platform, outlined Digital Human as "a photorealistic 3D human model" [2]. They characteristically used a method of conceptualizing through comparison with several similar concepts. They summarized the distinction between a general 3D human or a deepfake and Digital Human as a "structured 3D model" [2]. As a result, only Digital Human can be controlled, and it is confirmed that it is a different concept from 2D-based deepfake. Because of the technical flexibility of the digital human due to this controllability, Digital Human can be used in various situations. And as a sub-concept of digital human, "virtual human" and "digital double" are divided. First, virtual human refers to people who have their own unique (even if created) identity to some extent, such as Sidus Studio X's Oh Rozy and the first virtual influencer Lil Michela. Second, digital double is a copy of a real person, unlike virtual human, and thus there is a risk of legal or ethical problems. In any case, their Digital Human conceptualization model is meaningful in that it separates similar words and suggests inclusion relationships.

In some cases, AI is expected as the core technology needed by Digital Human. Saltlux, an artificial intelligence and big data technology company, defined Digital Human as "a 3D virtual human who looks like a real person and speaks like a real person" [3]. In addition, he added, "AI-based, lifelike character" through the term "AI human" [3]. This shows that the application of AI in the technological development of Digital Human is the best way to increase the human imitation rate of Digital Human and is the latest trend. Deloitte, a global accounting firm, conceptualizes the Digital Human as "an avatar that can produce a whole range of human body language" [4]. This discussion is equivalent to defining Digital Human with a focus on communication. They assumed that AI-based Digital Human have strengths in verbal communication by using interactive AI for Digital Human, and non-verbal communication based on AI's learning abilities such as facial expressions and hand gestures.

In spite of the lack of discussion on Digital Human in academia, there are some studies that are linked to production techniques based on the analysis of the opinions of leading companies. First, Seung-Hwan Lee and Sang-Yeol Han presented Digital Human as "3D virtual human with a shape similar to human appearance/behavior" [1]. In fact, Digital Human development company UneeQ has developed a customizable UneeQ Creator based on its own designed Digital Human, and the generalization and facilitation of Digital Human production is progressing. A study, which analyzed the production techniques of Digital Human and metahuman, said that the definitions of Digital Human mentioned above are established in a way to "①imitate the appearance of a real person, ②imitate the behavior of a real person, and ③replace the role of a person" [5]. They defined Digital Human as "a 3D human body model created by imitating the characteristics and appearance of a real person for the purpose of replacing human roles" based on commonalities [5]. Here, the purpose of the Digital Human as a 'human substitute' was confirmed. Also, they especially looked at the emergence of

'metahuman' as a progressive concept of Digital Human. It was borrowed from a metahuman creator using Epic Games' game engine, Unreal Engine. At the same time, they said that the previous method of the Digital Human was a ‘passive virtual human’ requiring manual labour, but the meta-human was an ‘active virtual human’ that is a mixture of a virtual human and a digital double.

As a result of some of the widely used concepts of Digital Human, they show that Digital Human, a relatively new ICT technology, is not yet organized or converged as the concepts of MR and XR, Digital Human, and the research is actively being conducted. Among them, based on the definition of Oh Moon-Seok et al., who identified relatively common characteristics, this study defines that Digital Human imitated human using digital technology to replace humans.

2.2. *Digital Humanism: Between Facts and Reality*

The ontological investigation of human identity, including objects that share similar or common characteristics with human, continues in various technological, material-ideological, and technical-ideological forms such as Cyborg, Neo-Humanism, Post-Humanism, Transhumanism. Excluding Neo-Humanism, which tried to philosophically reclaim the meaning of human existence under the assessment that human beings are facing an existential and ontological crisis [6], most of them can be seen as belonging to the technology-oriented Modern Humanism trend.

However, in the current of modern humanism ideology ontology about humans in the real world such as transhumanism has been mainstream in the academic and technical discourse for reasons of reality and threat. Perhaps it is because the avatars in the game, which have maintained their digital object, have significantly reduced their similarity to humans, and their development direction has been almost limited to the entertainment market. However, with the advent of the metaverse 2.0 era, a new request for digital humanism is being raised in such a humanistic discourse. Given the diversification and advancement of Digital Human, there is an urgent need to reinterpret Digital Humanism through comparison with a human being like other humanism discourses. Through this, the identity of Digital Human will be established and ethical and legal discussions about Digital Human will be more sophisticated.

When discussing the identity of a digital human, the ‘virtuality’ of the digital space should be considered first. This can be divided into types in which ground and identity meet in the relationship of fact and non-fact, respectively. The first is ground, based on which of the facts and non-facts the Digital Human is produced. In this case, the division is relatively easy. First, there is an example where Digital Human, based on facts, has the intention to copy and clone a real person and realize it as precisely as possible. It can be said that the ‘Digital Double’ of Virtuals as a name and the ‘Human Digital Twin (HDT)’ or ‘Digital Twins of the People (DToP)’ as a derivative of the industry’s digital twin technology are applicable. This paper will summarize it as a ‘Digital Double’, a digital doppelganger reproduced in a parallel world where only signals of 0 and 1 exist. An example of Turtle's leader, TurtleMan, restored in the AI music project 'Once Again', was completed based on two facts, the singer's voice and face. At this time, the AI learned the voice data from the actual singer's audio data and sheet music data. Also, AI learned facial data by using face editing technology that specialized in generative adversarial neural network (GAN) technology for faces. Other examples include the reincarnation of Carrie Fisher, who died of heart disease in 2016, as Leia in the Star Wars series, and the survivor ABBA's virtual concert scheduled for 2022. Currently, the digital double focuses on the digital revival of the deceased. Nevertheless, it has infinite potential for expansion in terms of use, such as the 20th presidential campaign in which AI presidential candidates appeared, and metaverse-based work or learning that participates as a virtual entity.

Next, Digital Human based on non-fact can be regarded as a digital object created with the purpose of creating an independent virtual human-like object. The name is mainly 'virtual human', and everyone, including real humans, becomes a virtual human from the point of view of all digital objects as virtual. Therefore, in contrast to the digital double, it is summarized as ‘Digital Single’, which is realized as the only human in the digital world. One example of this is the virtual influencers that have been rampant in the marketing world recently. AYAYI and Liu Yexi from China, also called virtual KOL (Key Opinion Leaders), Oh Rozy and Ms. XEN from Korea, and Lil Michela and Shudu are those cases. In addition, when Digital Single is used industrially, it is expected to have big potential as AI show hosts, VR game avatars, AI teachers, etc.

The second position on virtuality is a discussion of facts and non-facts about identity. Here, it seems to be somewhere on the continuum between fact and non-fact through a complex thought process according to philosophical views on existence and non-existence, real and fake, life and non-life, and humanistic discourse. In particular, since this study objectified Digital Human above all else, the discussion was focused on the possession of the Digital Human's own identity.

First, distinguishing the identity of Digital Human as a fact is equivalent to acknowledging its own existence, so it is called a ‘Digital Subject’ by acknowledging its subjectivity. The modern French sociologist Jean Baudrillard explained simulacre as an example of Mickey Mouse. He saw that Mickey Mouse, cloned from the reality of the mouse, is not regarded by us as a clone of the mouse (even disconnected from the reality of the mouse), but as an independent sign [7]. Therefore, Digital Human that has characteristically cloned a human is also an independent and a truth independent of the reality of human being. In a place where even reality is considered virtual and even digital networks are connected to reality, it is difficult to even say that Digital Human are not real [8]. As an example of standing at the center of this philosophical confusion, virtual influencers appear who are considered to already have their own identities such as worldview and inclination. They have with age and gender from the beginning and are born with hobbies and occupations, and their identities is recognized, and they even work as advertising models and ambassadors. Then, the answer to the question of what is different from the existing dolls or photos is the possibility of ‘owning reason’ due to the application of AI, and the fundamental root is the same as that of the Stoic school, which established the universality of human being from reason [9]. Of course, it is clear that AI is still far from being compared to human consciousness, so it cannot be perceived as a homogeneous identity with human. Nevertheless, they were considered Digital Subject because they had an identity as Digital Human themselves.

Next, it is a case where the identity of Digital Human is belonging to the realm of non-fact, and the technical and material properties of the digital person are assumed to predominate. This can be called a 'Digital Object' as it rejects the independent and subjective ability of Digital Human. By denying the identity of Digital Human, it is intended to give only a narrow role as a puppet and to define it as an instrumental character. This is merely diagnosing the Digital Human as a technologically progressive aspect of the existing game avatar. One such example is Parzival in Oasis in the movie 'Ready Player One' or Neo in the Matrix in 'The Matrix'. Digital Human can be said to be Digital Object when it is possible to give a negative answer to the question of whether it has an independent identity in terms of the identity of Digital Human. They are just like ‘shells of the soul’ that fill the human identity.

<Table 1> shows the virtuality dimension of this Digital Humanism by setting the x-axis as ground and the y-axis as identity. Ground, one of the two criteria, depends on whether a real person is cloned. Another criterion, identity, depends on whether Digital Human possesses a

unique identity for itself. Next, Digital Human can be divided into four areas according to two criteria. First, Digital Single-Subject is an independent human analog entity that exists only in the virtual world but is Digital Human with a unique identity. A prime example of this is the virtual influencer. Second, Digital Double-Subject possesses a unique identity and is Digital Human replicating a real person as it is, and Digitial Double even recreate deceased people. Third, Digital Single-Object is a being who lends an identity like a character in a game, and it means Digital Human who has neither his own identity nor a replica model. Examples include Parzival in Oasis in the movie 'Ready Player One' or Rui, a virtual YouTuber in dob studio. Fourth, Digital Double-Object is Digital Human that exists as a soulless replica and agent of a real person without a unique identity, such as ‘Neo’ in the matrix of the movie 'The Matrix'.

Table 1. Classification of Essential Characteristics of Digtital Human

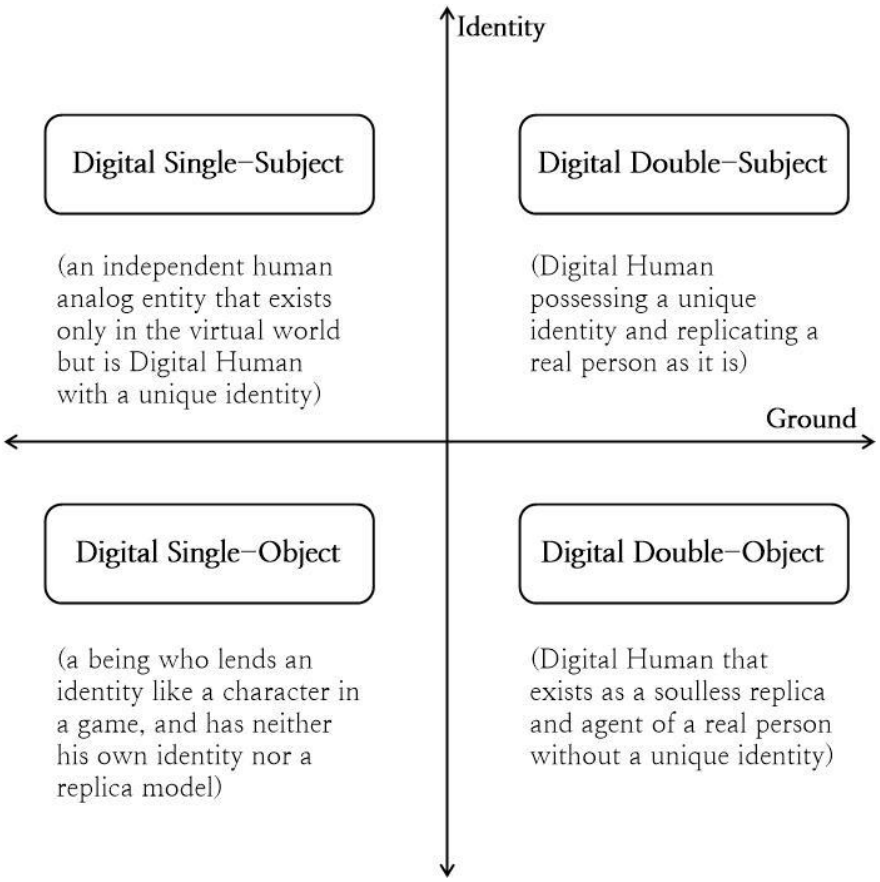
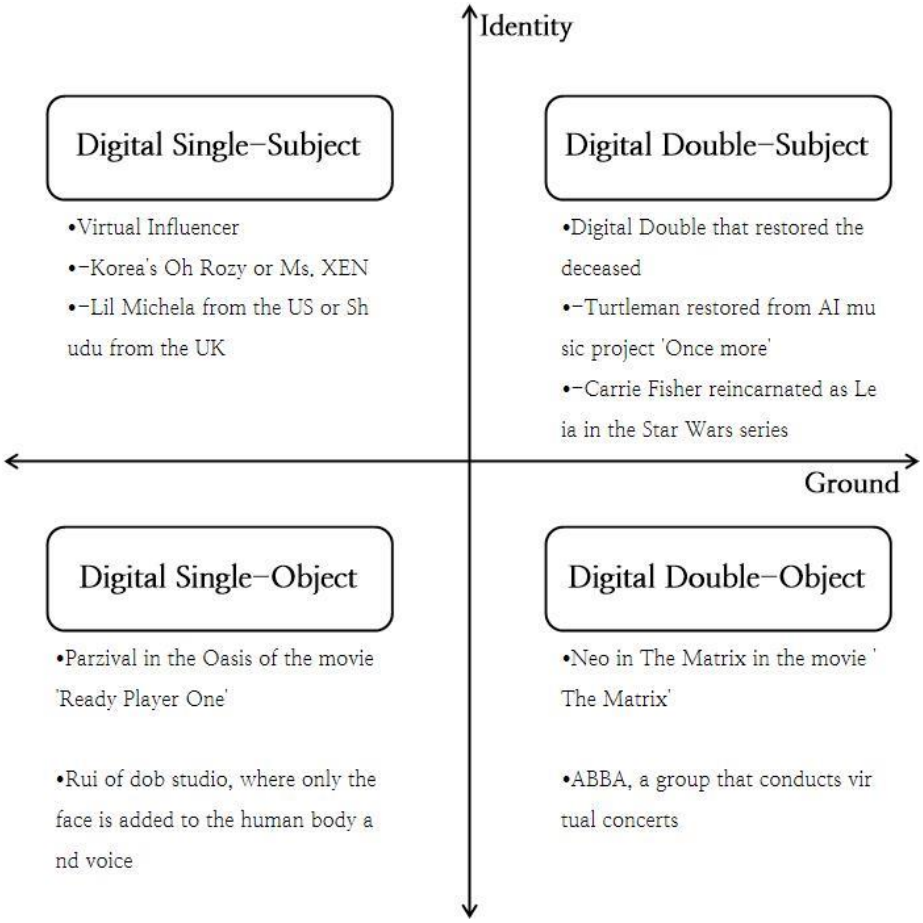


Table 2. Cases of the Essential Characteristics of Digtital Human



3. 'ADVISE', Assessment Model for Ethical Responses of Digital Human

Although there are still many issues to define the identity of a digital human, an ethical problem for digital humans is emerging as the content unethical of digital objects (-non-facts). Digital Object is a being in which meaning is given only when it is used and conscious of by a human, and human desires are inherently behind all digital virtualization [10, 11]. Ultimately, the ethical or unethical of a digital human looks like a problem that depends on the desire or intention of the person who uses it. Therefore, in the unethical contents of the digital human, the person must actively play the role as the subject of responsibility. Responsibility here entails not only causal responsibility in the traditional ethical conception, but also an extension to predictive responsibility, as Hans Jonas argues [12]. Also, due to their similarity to humans, the possibility of human rights violations is high when Digital Human is used unethically. A sense of ethical responsibility is required for each actor, such as developers and manufacturers, public entities, users, and educational entities. However, ethical measures instead of legal and technical measures first require an amicable social consensus among the subjects. For this purpose, the 'ADVISE (fAlsity, Discrimination, Violence, Invasion of privacy, Sexuality, dEependence)' model is presented as an assessment model for ethical response as shown in [Figure 2]. In the ADVISE model, the defects of various digital technologies are comprehensively considered due to the convergence technology aspect of Digital Human.

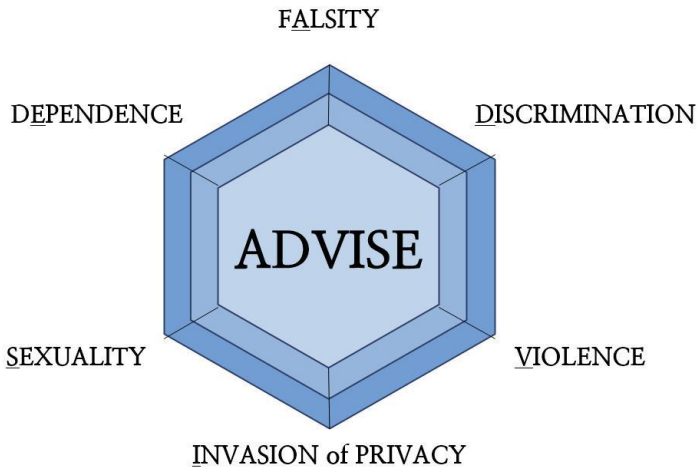


Figure 2. Digital Human's ethical response assessment model.

The first is fAlsity. Falsity is a prominent ethical situation in the Digital Double, and it is a question of how to protect the Digital Double's existential model. The purpose of the Digital Double is to be a perfect replica of a real person, so an explicit or implicit agreement with the target is required. In the case of photo that is 2D-based image human, even if they are real or falsity in a way, they are protected by the right of portrait, and if they are taken without consent, they must bear legal punishment as well as ethical responsibility. Therefore, Digital Double are also 'falsity of real', but a clear agreement on protection should be drawn up on the same line as photos. However, all Digital Double, except for the agreement situation, should be classified as 'falsity' in reality. Nevertheless, ethical requests for the falsity of this Digital Doubles are insufficient apart from for the awareness of sexual objectification. Even looking only at the cases of deepfakes, no specific guidelines were given, other than those stipulated in the Sexual Violence Punishment Law, which was amended in 2020. Also, the perception of falsity creation is revealed from the standpoint that it is different from falsity because the texts and pictures that sexually objectify male idols are only imaginary just by looking at the controversy caused by the RPS (Real Person Slash) Punishment Act promoted by some lawmakers. Despite the rejection of the position on both cases, however, the creation of Digital Double is very realistic, so stricter ethics against falsity seem important. In addition, in the case of deepfake, a transitional technology of digital double, the negative contribution to phishing and disinformation is increasing [13]. Therefore, appropriate ethical assessment and social consensus are required according to the trend of deepfake abuse cases.

The second is Discrimination. Bias in the world of artificial intelligence, discrimination and damage caused by it are the most discussed ethical issues. Most notable has been the discriminatory use of textual language by chatbot AI such as Tei and Iruda, but now, examples of discrimination related to images often emerge. A typical example is the Google Photos incident in 2015, which caused controversy because black people were classified as gorillas [14]. In 2020, Twitter apologized for racism in favor of white people over black people in its image cropping algorithm [15]. Seo et al. mentioned artificial intelligence as one of the essential technologies for precise Digital Human production [16], and the degree of technological intervention of artificial intelligence in Digital Human is rapidly increasing. Among them, the learning process for images is also included, so the case of discrimination of artificial intelligence above is sufficiently applicable. Also, they say that artificial intelligence can be

effectively used for interaction through natural language input and output in addition to image learning.

The third is Violence. The two major mountain ranges of diagnosing social dangers from digital media were sexuality followed by violence, and several studies analyzed both scales together [17-19]. Studies on whether such digital violence has a real social impact show both pros and cons of its causality [18, 20, 21]. However, the digital world such as the metaverse in which Digital Human acts is a comprehensive society that differs only in the signal system from the real world. Therefore, in the digital world, violence within the virtual world should be deal with at a short-distance manner, unlike the long-distance approach to violence in existing digital media or games. In this regard, the International Center for Countering Digital Hate (CCDH), a non-profit organization, reported a study result showing that one case of sexual abuse is exposed in Metaverse every 7 minutes [22]. Moving away from the traditional view of violence in the digital world seems to be the key, such as analyzes discussing the mixed nature of the metaverse and the real [23] or the differences between the metaverse and other internet platforms as a possibility of general action [24].

The fourth is Invasion of Privacy. The precious value of data is highly emphasized in the intelligent information society to the extent that data in the information revolution is given a position corresponding to the fossil fuel in the industrial revolution [25]. Contrary to ethical desires, sexual crimes based on the covert sex industry or unhealthy sexual perception grow together with technological advancement. After entering the digital society, conceptualization of online and cyber sexual violence began around the 2000s in Korea, and online sexual violence diversified with the diversification of media and platforms due to the development of digital technology [26]. Afterwards, the aspect of the development of sexual crimes was confirmed according to the technological leap, on the reconceptualization of non-consensual videos and image-based sexual exploitation along with reports of revenge porn around 2007, when smartphones and mobile technologies were developed. Therefore, it is highly likely that both Digital Single and Digital Double will become embroiled in controversy over sexuality, and ethical discourse should be raised accordingly. This is true whether in the form of Digital Human avatars or algorithmically controlled Digital Human agents, which they are the two classes of virtual human [27, 28]. For example, if an AI agent or AI anchor wears revealing clothing, an issue will arise as to whether it is inappropriate, and the extent of touch or sexual behavior within the metaverse is also controversial. In fact, in December 2021, the meta announced that it would introduce a “personal boundary” in the company metaverse as a technical measure to the case of physical contact between avatars reported in December 2021. Since an increase in related cases is inevitable in the future, a deep deliberation on the sexuality of Digital Human seems urgent.

The sixth is Dependence. In general, AI development types are divided into weak AI, strong AI, and super AI. In most cases, it is considered that it will take more effort before the arrival of strong artificial intelligence that is capable of many things like human [29-31]. The future value of Digital Human has a high proportion of collusion with artificial intelligence and will follow such a growth line, so the problem of dependence and reliability arises in the gap. In this ‘dependence gap’, ethical questions continue to be raised about how far to depend on the role of Digital Human, which extends to the issue of reliability. Looking at the convergence of Digital Human and politic, it seems that the AI presidential candidates that appeared in the 20th presidential election are not yet dependable Digital Human. Also, Digital Human that act as advisors to policymakers, such as AI assistants, are caught by general doubts about the effectiveness of AI decision-making [32], just like in the Japanese mayoral election in Tamashi [33]. Even other studies on the effectiveness of AI decision-making have given a yellow signal

to the rise of an AI politician or secretary, indicating that reliance on AI decision-making can make negative choices [34-38]. In other words, if the stable technology of artificial intelligence is secured, it strongly proves that Digital Human can be used in “mediated politics” mediated by an AI virtual assistant that appears in future political scenarios according to the trend of artificial intelligence by Son [31]. Here, there will be a difference in dependence between “mediated politics” and a robot government [31] where humans are eaten by super artificial intelligence. Therefore, it is necessary to stably lead the growth process of the Digital Human, a transitional being, through a predictive ethical perspective on dependence.

4. Conclusion

Despite the uncertainty of the future society expected from the development of current technology, the responsibility given to us now is to prepare for changes in our perceptions and attitudes. In this way, the technological changes that are approaching us can have a positive impact on the happiness of human life as much as possible. Thus, it becomes very important how one perceives and reacts to the emergence of the metaverse and related technologies in the age of intelligent information, which is immediately imminent. Accordingly, this study has considered the Digital Human presented as a part of the core technology of the metaverse from an ethical and political perspective.

The Digital Human poses a new characteristic problem about the essence of human beings due to its fundamental characteristics that cannot be included in the modern concept of Humanity. The identity of Digital Human beings is located between facts and non-facts. At present, the Digital Human seems to be close to the virtual, but there may come a time when it comes close to the truth, so a clear perspective on identity is needed. Therefore, in this study, Digital Human was divided into four types according to the identity and ground criterion. After combining all four categories, identity classification was again presented in four categories. The reason for this discussion is important is that the ethical approach to secure the safety of technology is different for each identity. In addition, the ‘ADVISE’ model was presented as a assessment model to contribute to ethical stability. This is to enable ethical filtering of major issues according to the development of Digital Human, but it lists rather narrow ethical standards, which is seen as a limitation. Therefore, the process of continuously tracking, correcting, and supplementing ethical issues related to Digital Human should be accompanied in the future. However, as this is still an early-stage study, an ethical response according to the improvement of digital human technology will be conducted as a follow-up study.

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