The Analysis of Virtual Reality Involving a Range of Ethical Issues

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Abstract: In recent years, virtual reality technology has experienced rapid development, conferring substantial convenience upon people and unlocking additional prospects for scientific and technological advancement. Nevertheless, the ethical ramifications of its immersive experience have emerged as a pressing concern that demands immediate attention. This paper delves into the ethical quandaries engendered by the utilization and progression of virtual reality technology. Employing a literature review method, interdisciplinary research, and a synthesis of theoretical and practical approaches, the study scrutinizes the backdrop of virtual reality. It undertakes a meticulous dissection of the implicated ethical issues, proffers corresponding solutions, and assesses the influence of ethical matters on the prospective development of virtual reality. The research concludes that while virtual reality technology holds great promise, unregulated ethical issues could lead to user psychological disorders, privacy infringements, and moral value distortions. By addressing these ethical concerns, the study aims to provide a theoretical framework for the sustainable and healthy development of virtual reality technology, guiding policymakers, developers, and users to make more informed and responsible decisions.

Keywords: Social Impact, Crime Trigger, Reality Disconnection, Legal Regulation

1. Introduction

Virtual reality (VR) technology employs computer systems and sensory devices to simulate the real world and the interactions between humans and that environment. It creates a three-dimensional space where users can engage with virtual objects through sensory equipment. This engagement results in an immersive experience that includes lifelike visual, auditory, and tactile feedback, making users feel as though they are genuinely present within the virtual environment [1].

With the industrial and commercial development of virtual reality technology, the realism and operability of virtual environments not only provide sensory pleasure but also psychological satisfaction for users. In the future, virtual reality may become as important as the real world, which necessitates careful consideration of the negative ethical impacts it may bring [1-2].

Virtual reality technology is integrating into daily life. Scholars have recognized its ethical issues and related paper numbers have increased since 2010. However, most discussions are from limited angles within the virtual environment and lack systematicness in exploring ethical issues and theoretical origins. In China, VR development started late. However, with the progress of internet

technology and living standards, its application has become widespread, benefiting cultural and economic aspects. Domestic articles on VR from philosophical and ethical perspectives are growing, mainly analyzing related issues from specific viewpoints [3].

The article employs methodologies such as literature review, interdisciplinary research, and a combination of theoretical and practical approaches. This research focuses on the ethical issues of virtual reality technology. As virtual reality is expected to have a profound and essential impact in the future, understanding its ethical aspects helps address various social problems. These include the potential substitution of real life for virtual life, data privacy infringement, and individual self-control regarding addiction to virtual worlds, games, and gambling. The development of any technology, like virtual reality, is a double-edged sword, and when applying real-world ethical norms to the virtual one, their effectiveness may decline. Since awareness of technology dangers often comes from trial and error, this study emphasizes the importance of proactive preparation. It encourages exploring forward-looking research in advance to initiate timely problem-solving, aiming to better manage the challenges and harness the benefits of virtual reality technology as it becomes an increasingly integral part of our lives [3-4].

2. Literature review

2.1. Impact on Human Cognition

Virtual Reality (VR) technology can provide users with realistic immersive experiences, and this sensory experience close to reality may influence users' mental and psychological states, potentially changing their behavior after leaving the virtual environment, thus posing certain potential ethical risks [5]. In the renowned "Virtual Pit" experiment within the field of virtual reality, subjects are aware of the ground conditions and the surrounding safe environment before they put on the virtual reality headset. At this point, they see a "huge pit" in front of them, with a narrow plank placed across it. The subjects are required to cross this plank to reach the "other side of the pit." The outcome of the experiment showed that only one-third of the subjects managed to cross the "pit," and they remained highly tense and fearful throughout the process. The rest of the participants were too scared to even step onto the plank due to fear [6]. The experimental results indicate that virtual reality may lead to a sensation of dissociation between consciousness and the body. The human brain can be unconsciously altered by the environment. The environment within the virtual world can influence a person's behavior, and this impact can carry over into real life. For example, many VR games contain violent and bloody scenes, and the immersive experience of VR can cause certain psychological and mental harm to players. In another famous experiment, the Milgram Obedience Study, although the electric shocks were virtual, subjects still exhibited behaviors of screaming, sweating, and crying out in terror [4]. The sense of fear and oppression felt in the virtual environment does not disappear upon returning to the real world; instead, it can have lasting psychological effects on users.

2.2. Disconnected from reality and socially isolated

Lippmann's famous concept of the "pseudo-environment" suggests that the media's portrayal of reality is not a mirror-like reflection but rather a representation that has been selected, filtered, and processed. This pseudo-environment, transmitted through media to the audience's minds, forms a subjective reality that deviates from the objective reality of society. This deviation is further magnified under immersive communication models [7]. When people are immersed in the world created by VR, its "high definition" makes the pseudo-environment indistinguishable from reality; as a result, over time, as the impression of the pseudo-environment becomes more deeply ingrained in human minds, the correct perception of objective reality becomes increasingly distant.

The rapid advancement of Virtual Reality (VR) technology will gradually permeate every aspect of our daily lives, potentially blurring the lines between the virtual and real worlds. As people become more deeply immersed in this "omnipotent" virtual world, interactions between individuals may decrease, leading to increased alienation. Once VR technology becomes ubiquitous, people can simply put on VR glasses or helmets and "personally" experience shopping, traveling, and gaming. They can even "participate" in education and work activities without leaving their homes, living without any barriers to communication. This immersive experience, almost indistinguishable from reality, may lead users to become addicted to the virtual environments created by VR technology, spending more time using VR devices and neglecting face-to-face communication with others. This could result in more indifferent interpersonal relationships [5].

2.3. Triggering more crime

In real life, personal information such as each person's name, appearance, age, and address is recorded. However, in virtual reality, personal information has the characteristic of anonymity. All information can be fabricated. Without constraints, the crime rate will greatly increase. Users do not recognize each other, vigilance is reduced, and desires are amplified, leading to actions that violate real-world values. Moreover, due to anonymity, the difficulty of combating and apprehending illegal activities increases significantly. At the same time, when VR technology strongly stimulates users' senses, it may cause users to have mental hallucinations, unable to distinguish between virtual reality and the real world, making them easily controlled in terms of spirit and behavior. If criminals use this method, the consequences could be unimaginable. For example, Mike Oreskes, the former Vice President of NPR News, criticized the VR documentary "Homeless: A Virtual Reality Experience" for not adhering to journalistic neutrality. He argued that the producers manipulated the audience by splicing together photos and videos taken at a crime scene after the fact, "leading" viewers to believe they were present at the crime scene, "deceiving" and even "manipulating" the audience's thoughts [5].

On the other hand, VR technology may trigger sexual criminal behavior in certain groups to some extent. Against the backdrop of rapid development in the internet and technology, virtual reality technology combined with internet connectivity has led to the development of a range of applications that include erotic elements, such as virtual games, virtual social interactions, and VR live streaming. When users engage with these applications, they are subjected to intense visual and auditory stimulation, which may lead to changes in their psychological state, thereby increasing the propensity for violent and criminal behavior. In a report, an American female player experienced sexual harassment while playing a virtual reality game. A male player, deducing her gender from her character's form and voice, engaged in inappropriate behavior towards her virtual avatar while she was playing a shooting game, including touching her character's "chest" and "hips." These incidents occur frequently, highlighting the issue of sexual harassment in virtual reality environments, which is a social ethics issue that requires serious attention from both individuals and society [2].

2.4. Personal privacy issues

When individuals use virtual reality systems, the systems often collect user behavior data with the consent of the user, which is then analyzed by third parties. The issue arises over whether this information could be stolen by these third parties, leading to a potentially massive data leak. In other words, as users engage with virtual reality systems, their behavior information or pre-designed virtual environments could be manipulated through illegal means, resulting in privacy breaches. If appropriate legal regulations are not put in place for the data and analysis, this could lead to unnecessary leaks of various types of personal privacy information. Additionally, technical shortcomings can also lead to data leaks. Virtual reality technology, for a period, had not reached its

highest level of development and still had certain limitations and risks. For example, to provide users with a better immersive experience, applications are equipped with eye-tracking and body sensors that allow for a complete description and replication of physical behavior in VR. This collects user behavior data in virtual spaces, such as how users move and interact, and their behavioral preferences within the virtual environment. Additionally, it may record data that reveals users' intentions in motion, such as eye movements, involuntary facial gestures, and emotional reactions when using virtual reality devices. The collection of these data touches upon the privacy of users' personal information and behavioral habits [8].

On the other hand, in virtual reality technology, the creation of a blended space that combines virtual and real elements relies on real-world spaces. Users' behavior in this merged environment can not only affect the virtual setting but may also have consequences in the real world. Thus, the violation of privacy rights is not limited to interactions among users; users may also infringe upon the privacy rights of non-users. Such infringements are more likely to manifest as intrusions into the personal spaces of non-users. A quintessential example is the game "Pokémon GO." The basic principle of the game is that players use the app to capture virtual cartoon characters known as Pokémon in real-world environments. The game utilizes the smartphone camera feature to make Pokémon appear on the phone screen within the real-world background captured by the camera, as if they are genuinely standing in front of the camera lens. To catch these Pokémon, players must move around in their environment until the Pokémon appear. A homeowner abroad noticed groups of young people frequently gathering near his home, making noise and occasionally entering his private garden to trample on his lawn. Upon investigation, he discovered that these young people were there to catch Pokémon in "Pokémon GO." Unfortunately, his home had been designated as a PokéStop by the game developers, where new Pokémon continuously spawned. In this case, the players' unauthorized entry into the homeowner's private space undoubtedly infringed upon his private space [9].

3. Problem solving

3.1. Improve relevant laws and regulations

The evolution of virtual reality technology is driving its integration with multiple industries, which has become an inevitable trend. This integration is not limited to pure virtual environments but extends to other areas that employ virtual reality technology. Consequently, these fields need to pay attention to the gaps in the current legal system and take swift measures to fill these voids. By improving relevant laws, strengthening law enforcement, and using legislation to regulate the behavior of virtual reality users, while also focusing on establishing ethical standards, is crucial for promoting the healthy and sustainable development of the virtual reality industry. The virtual reality envisioned is a digital world with global connectivity. In the face of moral differences across countries, it is necessary to establish a set of ethical norms with universal significance [10].

Humans play a key role in the formulation of laws. Firstly, we need to develop laws based on the current state of technological development and the challenges it faces, to restrict and punish those who deliberately violate legal and ethical norms. Secondly, as beneficiaries of the law, we should cultivate the correct values, a sense of right and wrong, and an understanding of technology, guiding ourselves with morality and restraining ourselves with the law. We should respect science and value technological development while adhering to legal regulations. Lastly, as overseers, it is our responsibility to ensure that technological development is centered on human beings, aimed at improving people's livelihoods, and that the application and development of technology comply with societal ethics and legal standards. Based on these comprehensive laws and regulations, relevant departments need to gain an in-depth understanding of current virtual reality technology and high-

tech fields to ensure that the law keeps pace with societal development. They must also provide effective legal rights protection for users from a legal perspective [2].

3.2. Enhancing technological security and guarding against data breaches.

In the field of high technology, using key technologies to prevent crime should be considered an important strategy. Since virtual reality technology is mainly based on computer technology and integrates a variety of high-end technologies, to regulate the development of virtual reality technology, it is necessary to pay close attention to the multiple technologies it involves. In virtual reality technology, code and algorithms are the foundation of building this technology; they compile cutting-edge technology together to achieve various functions within virtual reality. To prevent privacy infringement in virtual reality, we can implement it by writing specific code. For example, a blocking option can be set up, allowing users to remove others from their virtual view or mute loud noises. Such measures can indeed prevent some privacy violations.

On a more critical note, it is essential to strengthen the industry's own ethical self-discipline. In some companies, there are individual employees who take advantage of their positions to illegally obtain and sell user behavior data and virtual recordings for personal gain, which has become one of the main channels for data breaches. Therefore, companies must reinforce their own ethical self-discipline mechanisms, regularly conduct internal education and reviews, and especially supervise employees who have access to user data strictly to ensure their actions are legal and compliant.

3.3. Strengthen user awareness

With the rapid development of virtual reality technology, it has gradually permeated into various aspects of our daily life, including education, healthcare, finance, commerce, and shopping in our country. However, most citizens have not yet fully recognized the potential risks and dangers brought by virtual reality technology. Users cannot solely rely on national government departments for legislation and regulation, nor can they depend on technology companies to enhance security technologies. Citizens need to strengthen their behavioral norms when using virtual reality technology, raise awareness of privacy protection, and be vigilant about their rights when privacy is compromised. In this way, we can effectively guard against criminals using covert means to infringe upon our personal privacy and protect our rights. It also helps us to better control ourselves, avoiding excessive immersion in the virtual world to the point of not being able to distinguish between reality and the virtual world. Especially for adolescents, schools should include the discussion of the negative impacts of virtual reality in education, helping young people establish the correct worldview and outlook on life [2,6].

4. Conclusion

This paper comprehensively explores the ethical issues of virtual reality technology. It analyzes the impact on human cognition, such as the potential alteration of mental states and behavior, the problem of disconnection from reality and social isolation, the triggering of crime due to anonymity and strong stimulation, and personal privacy concerns including data collection and space invasion. Corresponding solutions are proposed, like improving laws and regulations and enhancing technological security and user awareness.

However, the research has limitations. The literature review might not cover all relevant studies exhaustively. Future research could focus on more in-depth empirical investigations into the long-term psychological and social impacts of VR. Methodologically, advanced quantitative and qualitative research techniques could be employed to better understand the complex relationships. In terms of content, further exploration of how different cultural backgrounds influence the perception

and handling of VR ethics is needed. Additionally, as VR technology continues to evolve, studies on the ethical implications of emerging VR applications and their integration with other technologies, such as artificial intelligence, will be crucial for ensuring the sustainable and responsible development of virtual reality. By leveraging the advantages of virtual reality technology, improving relevant regulations, expanding supervisory efforts, and enhancing user awareness, virtual reality technology will become a shining part of future civilization.

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