IMMERSIVE SPACE

A Manual of Virtual Realm

Soeun Yoon
Advised by Doug Scott

The digital world has slowly been creeping into our physical lives for a while. Consider the impact of smartphones: we now expect a personalized, digital dimension that complements our physical day-to-day lives. On this device, we have tons of applications such as Google Maps that estimates how to get to a destination via GPS, Instagram that connects us with friends who are thousands miles away, and SSENSE that makes shopping easy with hyper-personalized recommendations. While these exemplify some of the usages out of thousands of applications that each serve unique affordances, we have been creating our own virtual space in daily uses.

Observing how technological tools in Graphic Design have been developing shows our quick adaptation to the new material. Before computers were introduced, designers used phototypesetting which involved manually cutting and pasting materials in a physical studio. After computers were invented, everything became digital on screens; being able to directly manipulate type, photography, and color, designers adapted to the new invention as it dramatically saved time and increased efficiency in production. Ultimately, the computer became the studio. After augmented reality was introduced, digital presence has adopted another dimension. Explaining what virtual reality can do may sound similar to explaining what the Internet is back when it was first introduced. We did not expect the long-term effect of the Internet and that applies similarly to augmented reality* (AR) and virtual reality* (VR). While we're becoming increasingly reliant on digital technology, we simultaneously crave physical experiences; bridging the virtual and analog informs the so-called "phygital" movement. One of the prominent features of virtual reality is that it connects the physical and digital space around us; imagine what this new opportunity will lead to.

Please tab the screen to flip to the next page

Contents

MATERIAL

Digital Paper*

TYPEFACES

Klod

Johnston ITC

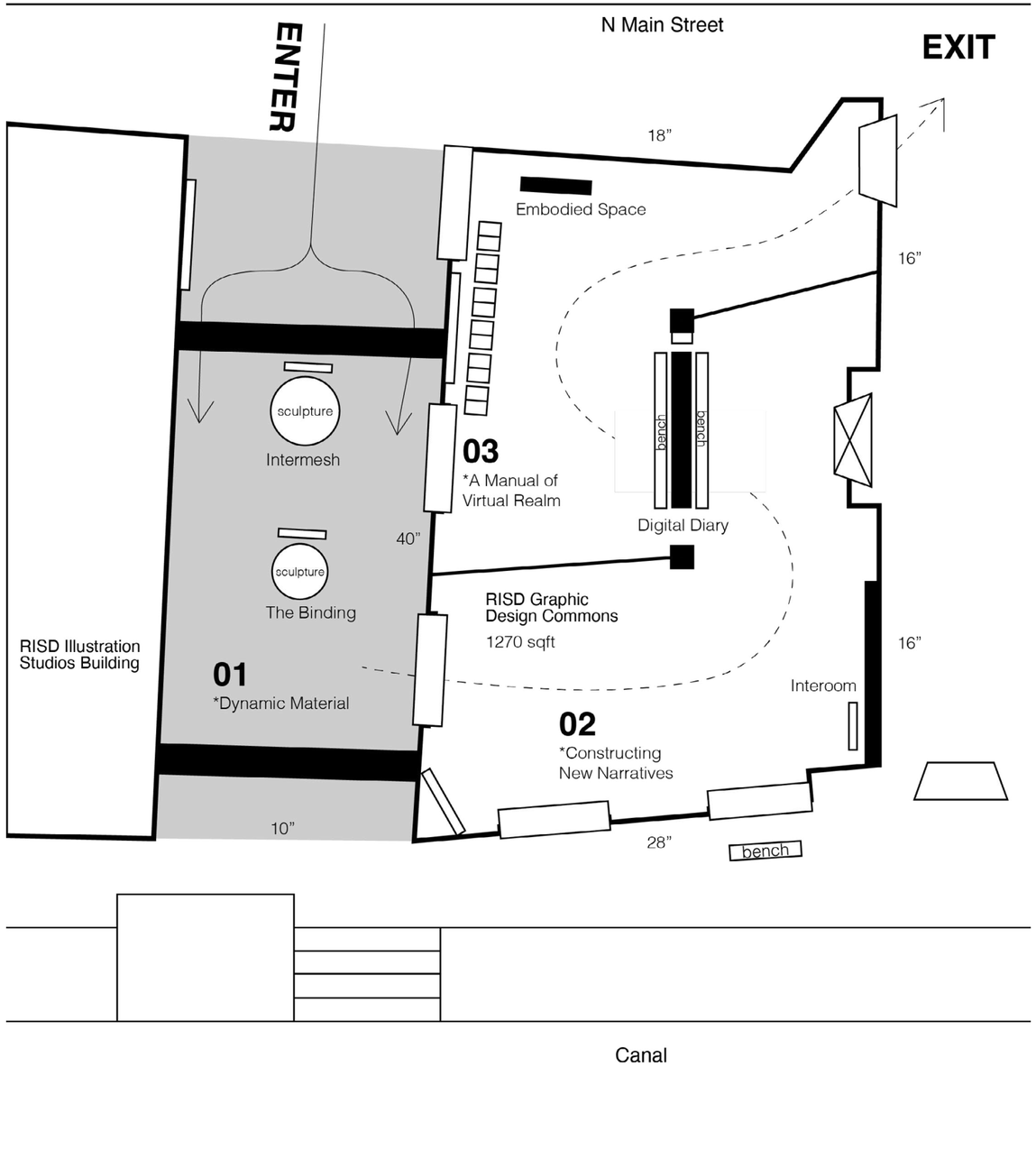
DESIGN and TEXTS

Soeun Yoon

DP Gallery Space Floor Plan

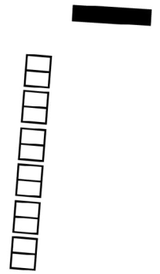
+60 minutes

Window
Door
Door closed
Column
Walking direction
Themed space
Table / LED Screen
Sculpture
Digital book
Description



DP Gallery Space Interactive Chart

~15 minutes

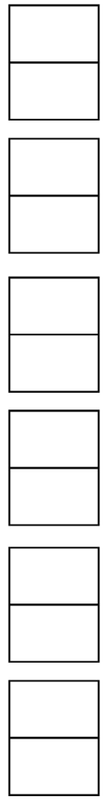


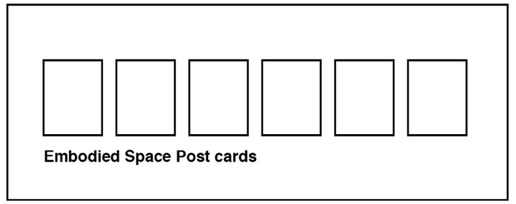
03
*A Manual of
Virtual Realm

A Manual of Virtual Realm & Embodied Space

There are six blank books that the contents of ***A Manual of Virtual Realm*** are projected onto.

A collection of prints, ***Embodied Space*** are placed on the table for the participants to take.





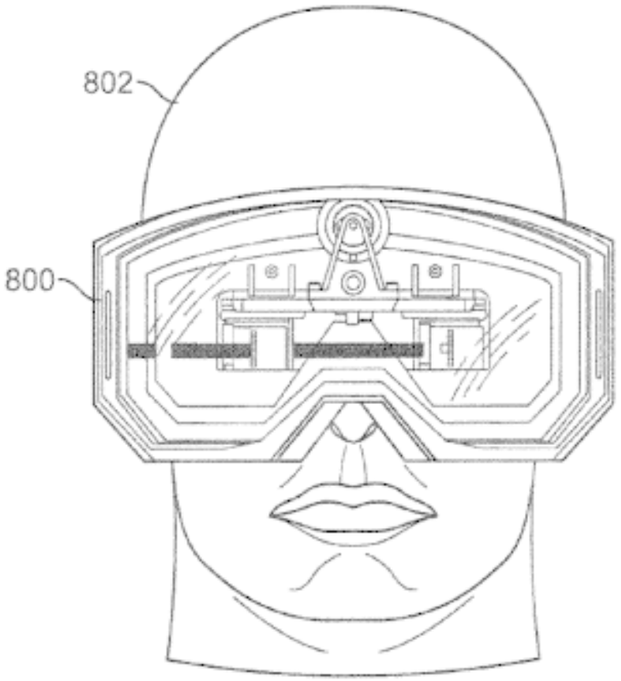
Embodied Space Post cards

A Manual of Virtual Realm Digital Book

About

A Manual of Virtual Realm establishes a standard for what is morally acceptable in the virtual space. The document is intended to acknowledge the need to further study the long–term effects of virtual reality and the relationship between physical and artifical space.

Examples included in this document are from personal experiences, *Software for Artists Book, and Virtual Reality: Ethical Challenges and Dangers, and Virtual reality Could Be an Ethical Minefield.*



APPLE. PROTOTYPE N301
This image represents the AR and VR headset application.

Ethics in Design

In the wake of society's exposure to virtual reality (VR), and due to today's powerful computer systems, designers are able to develop complex interactive virtual worlds; the original functionality of digital platforms can further be enhanced through VR with the deliverance and proximity of the physical and digital. These immersive environments offer numerous opportunities—both good and bad. Much debate has arisen over its ethical complexities such as virtual crimes, travel, and addiction. These questions arise because VR technologies are pervasive to classify, and because it is difficult to predict their short and long-term impacts. Decision making and ethics should go hand in hand throughout the development process.

How the system of regulations we follow in the physical world should be applied, and to what extent it should be considered in the virtual space needs to be justified in the development of the VR technologies. In the interview on On Navigating the Tension Between Physical and Digital Realms*[1], Rindon Johnson mentions that

> [...] there's this thing that I think we're going to start to run into, which is if I say I thought about robbing a liquor store, nobody can prosecute me because I didn't rob the liquor store. It was a passing thought. But if I physically rob a liquor store, you can prosecute me. In VR, it's much muddier, because it's like, if someone reaches out their virtual hand and touches someone's avatar body in a way that's inappropriate, they've done something to that person that feels physical. A passing thought has become a physical movement in virtual space, and has perhaps been enacted on someone in a way that makes them feel physically violated. How do we deal with that? (31)

Because artificial reality blurs the line between physical and virtual, it is necessary to rewrite how we deal with one another. For example, if the person is stabbed in the virtual space, how should that violation be prosecuted? Should the punishment be made in the virtual or in physical space? The victim does not physically feel the pain but mentally undergoes the experience of

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Rindon Johnson. On Navigating the Tension Between Physical and Digital Realms. https://pioneerworks.org/wp-content/uploads/S4AB001_Building_Better_Realities.pdf.pdf

GIANLUCA TRAINA. Portrait 360—Anonymous

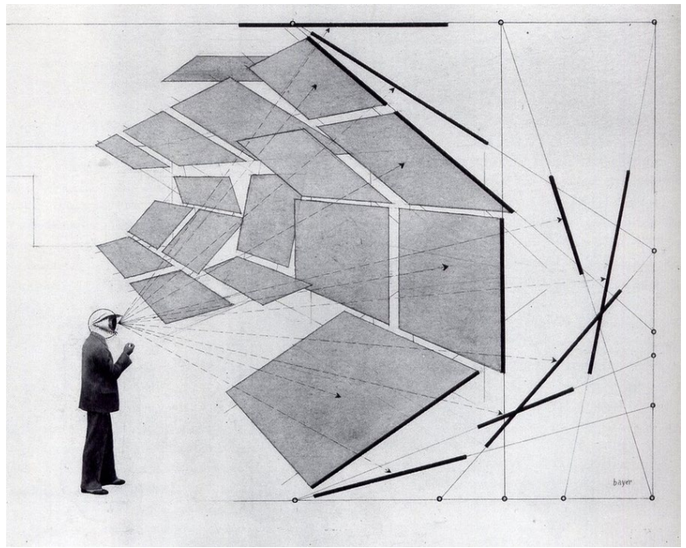
This sculpture depicts the concept of warp and weft, a system of representation of the image. Turning 2–dimensional surface 3D adapted to body shapes, it represents the transition of the VR user as an active user to an avatar in the artifical space.

getting stabbed. On a simpler note, more shared intentions must be promised just as we agreed to mute ourselves when we are Zooming with multiple people.

Recently, I watched a documentary by MBC called *I Met You* about a mother reuniting with her young deceased daughter in virtual reality. The project handles a controversial issue of using VR that strongly impacts one's personal life. Some people believe that the concept is wrong, as if the mother wanted to trick herself into simulation and live in a perpetual state of denial of her daughter's death. Opposed to the critics, the producers of the documentary assert that it was intended to help the mother who wanted closure. The mother lost her child so suddenly and felt she hadn't had a chance to say a proper goodbye. While some people think it is cruel to show a grieving mother an artificial representation of her daughter, or will cause people like her to get addicted to virtual reality in a failure to confront the present, the producers say it can be helpful in allowing grieving people to move on, accept the passing of a loved one and spend more time with the rest of the family. It is difficult to say what may work as a proper interaction of VR in regards to ethical issues — I believe we have a lot of discussions and questions to go through.

As Ben Kenwright asserts in *Virtual Reality: Ethical Challenges and Dangers*, "traditional moral responsibilities do not always translate to the digital world*[2]" — it is necessary to consider new regulations and standards for VR. Currently, there is a lack of information on the short and long-term psychological impacts of VR. Not enough studies about who and what types of individuals are using VR (age, types of experience, attitudes, and levels of digital sophistication) aggravates the problem. We need to look at VR as part of a system, and not just as an isolated, individual interaction. As VR combines multiple senses each of which influences the immersive experience, the synergistic operation of the system can, in turn, have a broader impact on the user.

Ben Kenwright. Virtual Reality: Ethical Challenges and Dangers. https://technologyandsociety.org/virtual-reality-ethical-challenges-and-dangers/



Design for the Unreal World

Anthony Dunne and Fiona Raby

Anthony Dunne and **Fiona Raby** are designers, educators and authors running the London-based studio Dunne & Raby. They use design as a medium to stimulate discussion and debate amongst designers, industry and the public about the social, cultural and ethical implications of existing and emerging technologies. They are currently University Professors of Design and Social Inquiry at The New School in New York.

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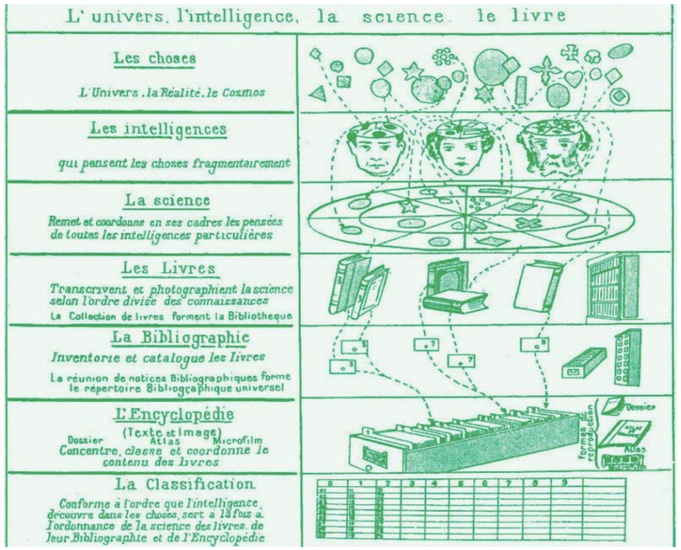
HERBERT BAYER. DIAGRAM OF THE FIELD OF VISION (1930)

If VR is to be considered as an exhibition space, designs should exploit the viewer's ability to look in a 360—degree motion. Presenting images beyond the horizontal plane expands a person's field of vision by encouraging viewers to piece together the patterns and finds meaning.

Tab on the image above to read additional studies



Ethics and Information Technology (2005) 7:111–119
DOI 10.1007/s10676-006-0008-0

Why we need better ethics for emerging technologies

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Abstract. Technological revolutions are dissected into three stages: the introduction stage, the permeation stage, and the power stage. The information revolution is a primary example of this tripartite model. A hypothesis about ethics is proposed, namely, ethical problems increase as technological revolutions progress toward and into the power stage. Genetic technology, nanotechnology, and neurotechnology are good candidates for impending technological revolutions. Two reasons favoring their candidacy as revolutionary are their high degree of malleability and their convergence. Assuming the emerging technologies develop into mutually enabling revolutionary technologies, we will need better ethical responses to cope with them. Some suggestions are offered about how our approach to ethics might be improved.

Introduction

New technological products are emerging. We learn about them regularly in the news. Information technology continually spawns new and popular applications and accessories. Indeed, much of the news itself is produced and transmitted through ever newer and more diverse information technology. But it is not only growth in information technology that is salient; other technologies are expanding rapidly. Genetic technology is a growth industry with wide applications in foods and medicine. Other technologies, such as nanotechnology and neurotechnology, are less well established but have produced striking developments suggesting the possibility of considerable impact in the not too distant future.

The emergence of these potentially powerful technologies raises the question about what our technological future will be like. Will the quality of our lives improve with increased technology or not? I believe the outcome of technological development is not inevitable. We at least collectively can affect our futures by choosing which technologies to have and which not to have and by choosing how technologies that we pursue will be used. The question really is: How well will we choose? The emergence of a wide variety of new technologies should give us a sense of urgency in thinking about the ethical (including social) implications of new technologies. Opportunities for new technology are continually arriving at our doorstep. Which kinds should we develop and keep? And, how should we utilize those that we do keep?

The main argumentation in this paper is to establish that we are living in a period of technology that promises dramatic changes and in which it is not satisfactory to do ethics as usual. Major technological upheavals are coming. Better ethical thinking in terms of being better informed and better ethical action in terms of being more proactive are required.

Technological revolutions

"Technology" is ambiguous. When speaking of a particular kind of technology, such as airplane technology, we sometimes refer to its paradigm and sometimes to its devices and sometimes to both. A *technological paradigm* is a set of concepts, theories and methods that characterize a kind of technology. The technological paradigm for airplanes includes the concept of a machine that flies, the theory of aerodynamics, and the method of using surfaces to achieve and control flight. A *technological device* is a specific piece of technology. The Wright brothers' airplane and commercial jetliners are examples of technological devices. Technological devices are *instances* or *implementations* of the technological paradigm. *Technological development* occurs when either the technological paradigm is elaborated in terms of improved concepts, theories, and methods or the instances of the paradigm are improved in terms of efficiency, effectiveness, safety, etc. Of course, technological development has occurred in numerous technologies over thousands of years.

PAUL OTLET'S CONCEPTUAL MODEL of how human knowledge is recorded.

The universal catalogue transcends the limitations of individual and physical carriers of information. Information the users consume in the VR will be classified and recorded into a system that is embedded in the physical space as well.

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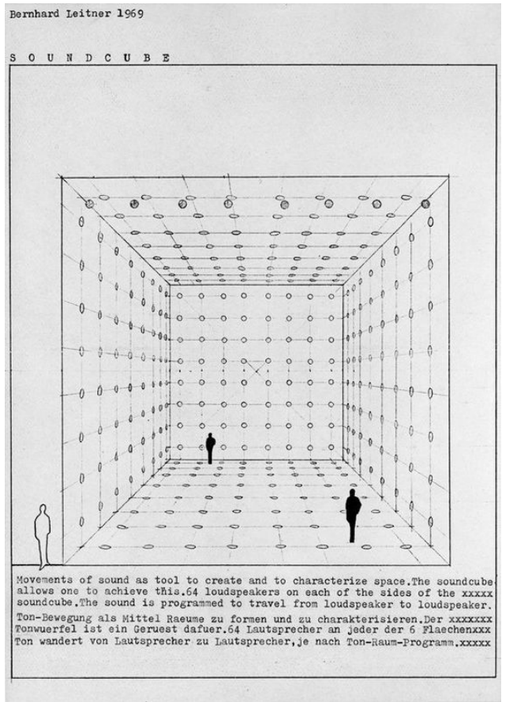
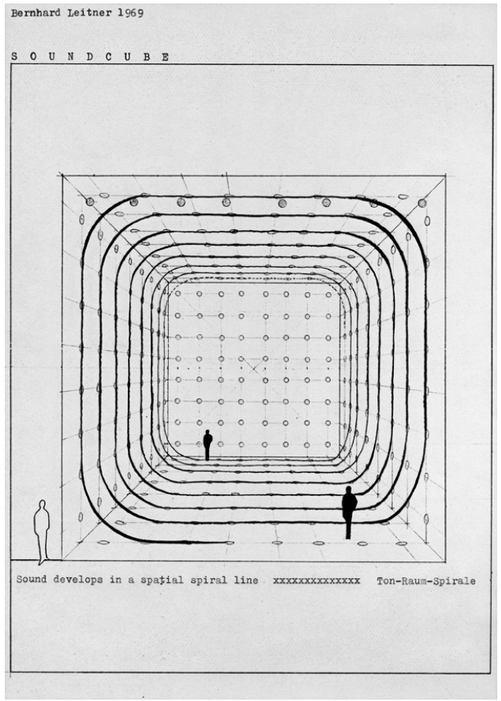
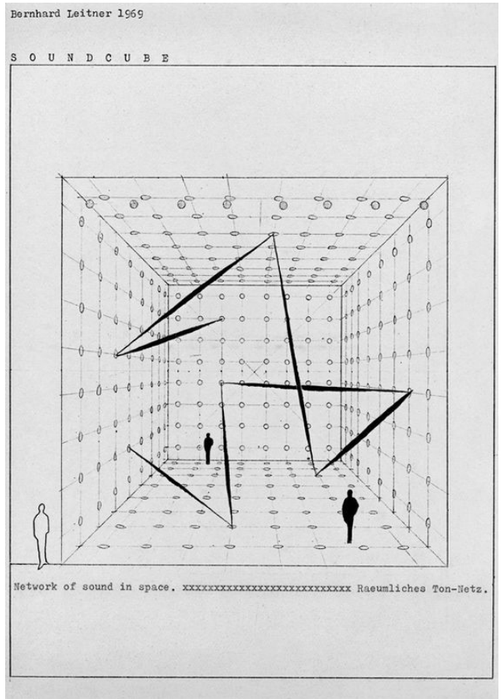
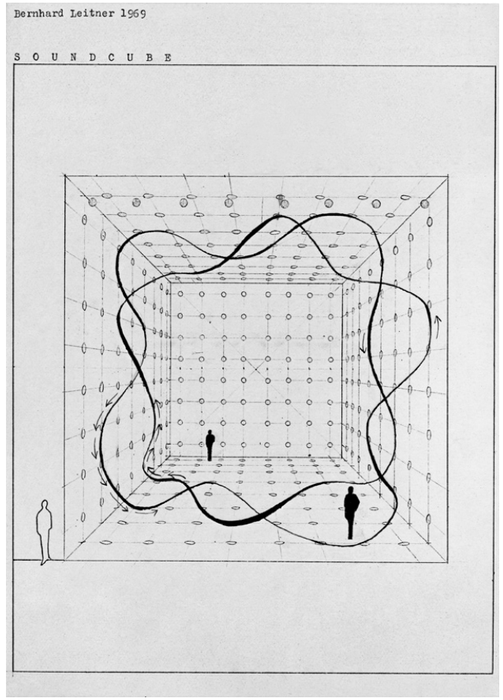


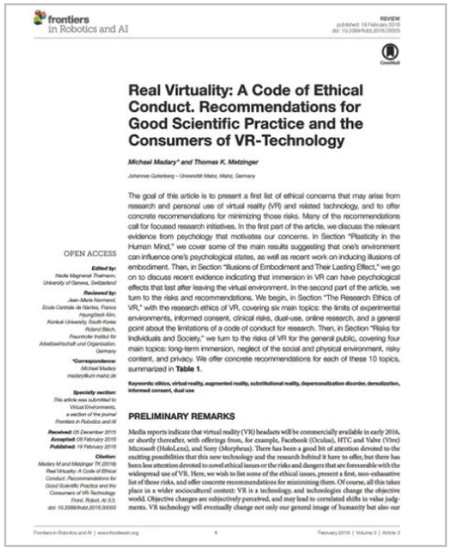






BERNHARD LEITNER. Soundcube (1969)

His research shows the sounds to travel from one side to another, circling, spiraling, changing in pitch and direction. To provide an immersive experience, the prominent element of VR, audio adapts to the network of sound in space.



frontiers in Robotics and AI

REVIEW

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Real Virtuality: A Code of Ethical Conduct. Recommendations for Good Scientific Practice and the Consumers of VR-Technology

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The goal of this article is to present a first list of ethical concerns that may arise from research and personal use of virtual reality (VR) and related technology, and to offer concrete recommendations for minimizing those risks. Many of the recommendations call for focused research initiatives. In the first part of the article, we discuss the relevant evidence from psychology that motivates our concerns. In Section "Plasticity in the Human Mind," we cover some of the main results suggesting that one's environment can influence one's psychological states, as well as recent work on inducing illusions of embodiment. Then, in Section "Illusions of Embodiment and Their Lasting Effect," we go on to discuss recent evidence indicating that immersion in VR can have psychological effects that last after leaving the virtual environment. In the second part of the article, we turn to the risks and recommendations. We begin, in Section "The Research Ethics of VR," with the research ethics of VR, covering six main topics: the limits of experimental environments, informed consent, clinical risks, dual-use, online research, and a general point about the limitations of a code of conduct for research. Then, in Section "Risks for Individuals and Society," we turn to the risks of VR for the general public, covering four main topics: long-term immersion, neglect of the social and physical environment, risky content, and privacy. We offer concrete recommendations for each of these 10 topics, summarized in **Table 1**.

Keywords: ethics, virtual reality, augmented reality, substitutional reality, depersonalization disorder, derealization, informed consent, dual use

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PRELIMINARY REMARKS

Media reports indicate that virtual reality (VR) headsets will be commercially available in early 2016, or shortly thereafter, with offerings from, for example, Facebook (Oculus), HTC and Valve (Vive) Microsoft (HoloLens), and Sony (Morpheus). There has been a good bit of attention devoted to the exciting possibilities that this new technology and the research behind it have to offer, but there has been less attention devoted to novel ethical issues or the risks and dangers that are foreseeable with the widespread use of VR. Here, we wish to list some of the ethical issues, present a first, non-exhaustive list of those risks, and offer concrete recommendations for minimizing them. Of course, all this takes place in a wider sociocultural context: VR is a technology, and technologies change the objective world. Objective changes are subjectively perceived, and may lead to correlated shifts in value judgments. VR technology will eventually change not only our general image of humanity but also our

Frontiers in Robotics and AI | www.frontiersin.org 1 February 2018 | Volume 3 | Article 3

RAF RENNIE. Modern Nostalgic Fantasies

The user of the VR technologies find it inevitable to cross the boundary of the virtual and physical. The blurred relationship causes disturbance that the long–term effect has not been discovered yet.

Tab on the image above to read additional studies

A Need for Further Research

In developing virtual technologies, designers should consider addressing the implications of the embodied space, and demonstrate reasonable caution through monitored testing. Further research needs to include predictions, forecasting impact, evaluating with openness, and identifying any issues with transparency.

The growth of VR technologies has led to an increase in accelerated development of the VR industry, and huge opportunities for new and innovative VR applications, beyond entertainment uses. On the other hand, there are numerous challenges and ethical issues that need to be addressed. If the VR economy is to continue to grow while maintaining sustainable healthy new developments, it must be supported by extensive research to investigate the ethical issues around these technologies.

Virtual Reality...resists description, the way a dream or memory does (2).

VR isn't simply a new form of media; it sweeps away the barriers of all previous forms (2).

...with the emergencne of VR, our social networks have become, quite literally, embodied (116).

What was once an anonymous commenter is now an anonymous avater—in the form of another being standing right in front of you. What was once a tossed off insult or slur is now the ability to invade your personal space (116).

The question...isn't simply how you make VR safe for all people, but how you do it now, in the technology's relative infancy...social media platforms like Twitter and Instagram especially priotized growth over safeguards (112).

Of the five human senses, a VR headset can currently stimulate ony two: vision and hearing (172).

...even if VR porn scenes last the same amount of time as conventional scene might...they feel different. That's because of the eye contact, and the whispering, and the stimulated kissing, and all the ways the directors and performers are learning to take advantage of proxemics and presence (212).

They also feel different because the entirety of the scene, from premise to climax, feels like part of the same encounter (212).

VR won't just change our leisure time. It will change our way culture (10).

...if VR feels real and we remember it as though it's real, does that make simulated sex in VR cheating? (15).

...it turns out that VR can not only help you learn and retain information, but also create memories that are indistinguishable from real–life memories—which is something we've never had to contend with before (14).

...your senses can be manipulated so that you perceive the virtual world to behave the same way you perceive real life. To do that, two illusions need to be manipulated: that there's depth in the world, and that you're able to look (and move) anywhere you want within it, just as you would in life (29).

...the key: "the individual can indicate correctly that s/he is using the technology, but a some level and to some degree, her/his perceptions overlook that knowledge...as if the technology was not involved in the experience" (31).

You've been charmed, terrified, intrigued, and disoriented. You've spent what feels like an hour getting your first taste of presence. In reality, though? It's been only about seven minutes. Congratulations: now you know the magical elastic properties of "VR time" (39).

RUBIN, PETER. ***Future Presence; How Virtual Reality Is Changing Human Connection, Intimacy, And The Limits Of Ordinary Life*** (2018). New York, NY: HarperCollins Publishers.

The above are pulled sentences from his book that depict both the rising problems of VR. The extreme exploitation of the technologies will unlikely to happen in reality because regulations and rules will be established by the company and the designers.

IMMERSIVE SPACE