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Vera Tan Hoveling
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There is no such thing as (virtual) reality.
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Contents

"We were the first human beings who would never see anything for the first time. We stare at the wonders of the world, dull-eyed, under-whelmed. Mona Lisa, the Pyramids, the Empire State Building. Jungle animals on attack, ancient icebergs collapsing, volcanoes erupting. I can't recall a single amazing thing I have seen firsthand that I didn't immediately reference to a movie or TV show. A commercial. You know the awful singsong of blase: Seeeen it. I've literally seen it all, and the worst thing, the thing that makes me want to blow my brains out, is:

The secondhand experience is always better. The image is crisper, the view is keener, the camera angle and soundtrack manipulate my emo-tions in a way reality really can't anymore. I don't know that we are actually human at this point, those of us who are like most of us, who grew up with TV and movies and now the Internet. If we are betrayed, we know the words to say; when a loved one dies, we know the words to say. If we want to play the stud or the smart-ass or the fool, we know the words to say. We are all working from the same dog-eared script. It's a very difficult era in which to be a person, just a real, actual person, instead of a collection of personality traits selected from an endless automat of characters. And if all of us are play-acting, there can be no such thing as a soul mate, because we don't have genuine souls. It had gotten to the point where it seemed like nothing matters, because I'm not a real person and neither is anyone else."

Gillian Flynn, Gone Girl

There is no such thing as (virtual) reality.

The reason for this thesis is my long lasting love and fascina-
tion for computer simulations. At eight years old I was introduced
to the, back then, completely twodimensional SimCity. A fascinating
world that seemed to take place only in the window of my desktop. A
world that I could control but at the same time was able to autono-
mously manage itself during my toilet breaks. In SimCity world and
the later following Theme Hospital, The Sims and Rollercoaster Tycoon
I had the opportunity to be a big boss as a child. Sims lived happily
ever after, cities flourished, hospitals and theme parks blossomed
when I wanted them to. If I happened to be in a more grim mindset,
with the same ease my sims would starve to death and cities perish,
theme parks and hospitals would be carpeted with vomit. I was a teeny
tiny god in complete control. I have loved that feeling ever since;
to be a desktop window god. Later, much later, I would find out that
the names 'Sims' and 'SimCity' derive from the word 'simulation'.
Of course. As a kid I had just accepted the names as such, assuming
their creators must have thought of it as catchy.

My computer simulation-fascination is probably rooted in the high-
ly immersive effect of visual computer simulations. Immersion is a
nowadays widely used – term to describe the effect caused by modern
technology that one feels as if he/she really were part of a virtual
world or system. The term immersion derives from a metaphorical use
of the phrase being submersed in water. Immersive effects are par-
ticularly strong in visual computer simulation, where an image world
is shaped that seems to be alive. By interacting with this virtual
world you become increasingly involved in the logic and decision-mak-
ing structures of the simulation and thus in the experience of be-
ing part of the whole.[1] And the more complex the simulation, the more
it appears alive. Because the more complexity is involved, the more
it will appeal to the nature of nature, dealing with an innumerable
amount of variables.[2] Not only do such simulations appear alive to
us, they are perceived as alive. If the level of immersion is over-
whelming enough, virtual reality becomes reality.

Well. Does it really?

For this thesis I desired to investigate the 'virtual reality' becoming 'reality'. But instead of finding out how that works, I found out that virtual reality does not exist.

It will be nice to have some consensus between me and you on what I mean when I mention reality and virtual reality. So let me first define the two concepts really simple and according the Oxford Dictionary of English:

Virtual: *Not physically existing as such but made by software to appear to do so.*[3]

Reality: *The state of things as they actually exist, rather than as they may appear or might be imagined.*[4]

Prior to deciding to use these definitions was a lot of deliberation. They still leave plenty of room for questions. What might existence or imagination be? Is an abstract concept the sole product of imagination? Does something only exist when is has an appearance? How does truth relate itself to reality? These questions drove me right into the arms of the philosopher Jean Baudrillard, whose definition of what is real and not felt to me as most real. We will come back to his story later on. Untill Baudrillards introduction I will use the dictionary definitions. They connect to the use of direct realism. Direct realism is the assumption that our senses provide us with the direct truth. It implies that for the last decades we've had a separate reality, taking place in the physical world and a virtual reality, calculated by computers. Applying this separation is a challenging task too.

Reality and virtual reality started out as quite separate worlds in the eighties. Is was a time that computers where expensive and nothing but commonplace. But computers have become commodities today. Virtual reality and reality have grown together into one big mess. People make themselves a living by making a living in Second Life, augmented reality browsers reveal hidden virtual objects in "real world"-space and Kinect sensors are used to control avatars with body movement. Like what happens to strings of knitting wool left in a basket unattended for too long, these realities are entangled.

Several attemps have been made to separate the strings or distinguish different 'kinds of realities'. For that purpose the notions of mixed reality, augmented virtuality and the virtuality continuum have been introduced. I would like to discard these cute attempts at order in chaos and I will not mention them again from here on. As I have come to the conclusion that there is no such thing as a separate reality or virtual reality. So neither is there anything to be separated in between.

My research to define virtual reality already directed me towards this conclusion. This suspicion grew when investigating the earlier mentioned immersive effects of computer simulation on people. It has become clear to me that there is for our experience little difference between being immersed in reality, virtual reality or a hybrid combi- nation: for the experience it is equally real. I will also illustrate this later on with the use of Maslow's pyramid.

Postulating there is no such thing as virtual reality or reality leaves a giant gap where the classic reality-virtualreality clarity used to be. It feels uncomfortable and rather irresponsible to leave a gap like that. So I want to substitute the idea of 'the reality' or 'the real' by what I consider to be a much more appropriate approach: the model of reality. But first, let us take a look at what it all started: defining (virtual) reality.

"Virtual" Reality

I like to think about parallel worlds, the possibility of a multi-verse, in which a multiplicity of realities co-exist. Like the many worlds hypothesis by quantum-physicist Hugh Everett, known mostly by its popular example of Schrödinger's cat, where as long as we don't check into the cat it is both dead and alive at the same time. According to Everett, every historical what-if, compatible with the initial conditions and physical law, is realized in another universe. I like to think a parallel universe exists in my computer, that parallel universes take place in everyone's computer, that there are innumerable universes out there. (It should be acknowledged that I am not using the term parallel in the scientific correct way in my computer-fantasy: parallel universes by definition do not communicate with each other or observe one another. For they are infinitly parallel. I am aware of this yet lack a better word.) A bit like the Metaverse perhaps. The Metaverse was introduced in the, amongst geeks, legendary science fiction novel 'Snow Crash'. It is a virtual 3D planet, accessible like the internet, functioning like a, there you have it, parallel universe. The Metaverse has great similarities with some of the nowadays massive multiplayer online games, particularly with Second Life (though SL's founders have been denying Snow Crash as an inspiration).[5]

If different realities were simply to distinguish as embracing everything in one universe I'd have had an easy time defining. I've hoped for that. Sadly, it is not the case. One universe can hold many realities. Par example as in the simulation hypothesis that states that our perceived reality is a computer simulation of reality and those affected are unaware of that.[6] A theory that thanks to the Matrix you might be familiar with. In this universe we have multiple realities: the reality in which the computer is simulating a reality and the simulated reality.The theory on simulacra and simulation by philosopher Jean Baudrillard explores exactly this phenomenon; reality dealing with simulated reality.

A teeny tiny explanation of that theory: A simulacrum, if we inter-
pret it in the Baudrillard way, is a simulation that has no longer
any meaning as a reflection of its origin but instead has become
a reality on its own.[7] Like a photoshopped picture in advertise-
ment that started out as an imitation of the depicted. It has been
changed, so it is no longer a representation of reality. The image
made its way back to our consciousness via billboards and we have
accepted it as the new standard and point of reference. The photo-
shopped image has substituted that what it originally imitated. This
reality spin-off that the simulacrum evolves into is no longer real-
ity, it is hyperreality: "Perfect simulacra, forever radiant with
their own fascination".[8] Hyperreality and reality happily co-exist.
They are equally real and do not exist without each other.[9]

Baudrillards theory, described in the 1980's has proven incredibly
accurate in its application to the age of modern media of the 2010's.
Examples of this theory can be found to be strongly related to com-
puters and modern media, like photoshopped images, complete CGI mov-
ies, the internet and Second Life. Artist Oliver Laric provides with
his story a striking example:

*"Walking around a sculpture and viewing a single perspective in a
catalog are different experiences, but both are authentic and vivid
experiences. My favorite sculpture is easy to experience as a de-
scription. It is a Virgin with child built around 1510 out of sand-
stone in Basel. Reformation iconoclasm came and the baby Jesus was
replaced with a scale in 1608. The Virgin is now Justice. The first
part of her life was very spiritual; the current is more pragmatic. I
am curious to witness her upcoming incarnations. Out of love for this
statue, I asked a 3D modeler to reconstruct her digitally, coating
her in a terminator-esque chrome texture. In Terminator 2: Judge-
ment Day, the antagonist T1000 was capable of assuming any shape,
just like Barbapapa. I made a pilgrimage to see the statue and it was
an underwhelming experience, like seeing the movie after reading the
novel."* [10]

Second Life brings us a second illustration of the co-existence of reality and hyperreality. In Second Life a lot of aspects of modern life are imitated. So is currency. Second Life citizens spend and earn Linden Dollars, L$. This currency can be exchanged for 'real' dollars, $. A person can earn virtual money in virtual space by selling 3D outfits to others in Second Life or real-estate, even work as an architect. That virtual currency can be changed for a real-world currency. By doing so people are able to make a living for themselves in 'the reality', in hyperreality.

So where is the distinction between a simulated universe and our 'real' universe, when the distinction is so blurred? Is there actually a difference? Isn't the virtual universe in my desktop window just part of the real universe, since it happens in real computers? And isn't the real universe inseparable from the virtual if we can provide for ourselves with it? Aren't both realities adopting each other's features?

Growing integration of virtual reality techniques in our daily life has contributed to this reality-soup by making the border between the virtual and the real literally less and less visible. What once were wild geek dreams have now become commodities: QR-codes on posters that easily redirect our mobile phone to virtual places and augmented reality browsers integrate the street even further with the internet, touch-screens on mobile phones provide an incredible natural interface and ultraHD makes moving images photorealistic. The current level of immersion in virtual reality we are exposed to on a daily basis would have been unimaginable in the 1980's, yet we seem to barely notice it. This is a curious concept: like eyes adjusting to the brightness of light, the mind seems to adjust itself to levels of immersion. This phenomenon too, was described by Baudrillard:

"We dream of passing through ourselves and of finding ourselves in the beyond: the day when your holographic double will be there in space, eventually moving and talking, you will have realized this miracle. Of course, it will no longer be a dream, so its charm will be lost." [11]

An appropriate historic example of this might be 1883 "Battle of Sedan panorama": A 1725 m2 photorealistic painted panorama of the battle of Sedan. In front of it was a complementary terrain installed with spatial objects like bushes, rocks, weapons and cardboard figures. There was even matching marching music. The day after its opening, it was in every newspaper in Germany:

"The visitor is gripped immediately, he is taken completely by surprise and instinctively holds back. One is afraid of being trampled by the horses' hooves and feels the urge to concentrate on going backwards. Swirling dust and smoke seem to fill the air. Trumpets blare and drums bloom. In an overwhelming onslaught, the cavalry charge. What multitude of horse, they are the French! That's the first impression!" [12]

The panorama had become sort of a rage in the nineteenth century.[13] Not to everyone's amusement. Effects very similar to the more recent phenomenon of simulator sickness were described and concerns raised that the audience would eventually no longer be able to distinguish reality.[14] For the modern eye, spoiled by moving image in every corner it aims at, it is almost unimaginable that once a static panorama moved so many peoples senses.

The story of the panorama shows us how much our idea of what a simulated reality is has changed in a little more than a hundred years. In this age with all of our immersive technology, we'd categorize a panorama painting as belonging in the reality rather than in virtual reality. Maybe in fifty years we'll have a good laugh at the by then rudimental technology of today too. Maybe we'll even laugh about our trivial attempts to distinguish different kind of realities.

So hyperreality and reality co-exist as illustrated with photoshopped pictures and Second Life. They are irreversibly intertwined. The border is unclear and has faded with advancing technology.

The reality experience

In different researches on the phenomenon of immersion, different divisions of the concept have been suggested in order to achieve a deeper understanding. I particularly feel for the categories divided by Staffan Björk and Jussi Holopainen in their book Patterns in Game Design:[15]

Spatial immersion: When the simulated world is perceptually convincing, it feels as if you're really "there" and the simulated world looks and feels "real".

Sensory motoric: Experienced when performing operations that require skill such as hand-eye coordination.

Emotional: Getting hung up in the simulated world emotionally.

Cognitive immersion: This is associated with mental challenge, such as solving a puzzle.

This division of immersion appeals to the dissection of presence made by Dutch psychologist Martin van Velsen. Presence is the psychological research of 'being there'.[16] Presence is a compound notion and amongst psychologists is still some rumour on the accurate definition. But for our means, the above description will do. Presence is also not really the sole territory of psychologists. It is the domain of philosophers, artists, neuroscientists as well, where it is referred to as the field of 'the consciousness'.[17] Taking all of that into account, van Velsens division of presence is thus:

Existence presence: When physical phenomena are experienced. As with physiological needs the possibility of danger or the perceived threat of danger is not excluded; the body isn't necessarily (perceived as) secure. Like a rollercoaster ride can be a simulation of physical danger.

Physical presence: Besides physical experiences one also interacts with the environment via a physical interface, joystick, touchscreen, steering wheel.

Social presence: This requires the presence of other human beings. Explicitly not bots (artificial intelligence operating as an autonomous entity) as bots are always recognized. They have just not reached the level of human interaction yet and as soon as interaction occurs, especially conversation, they're always exposed as the imposter they are.

Performance based presence: Requires interaction and feedback that stimulates further engagement from the environment.

Intellectual presence: Requires intellectual effort from the brain, like making strategies to get further rewards.

We can use this division to make a pyramid, sorted by the intensity of the presence experience.[18] The pyramid that is constructed shows strong resemblance to Maslows pyramid of the basic human needs:

Maslow's Pyramid   Presence Pyramid
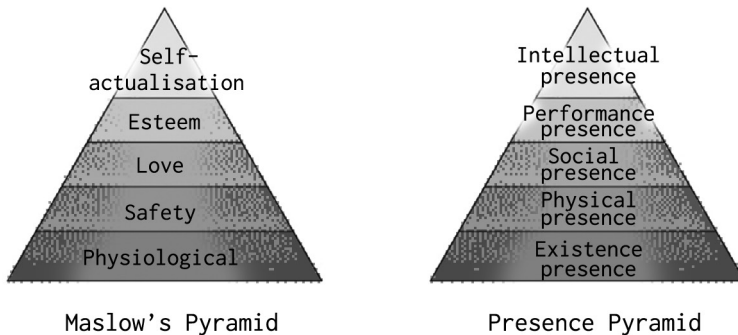
You might be familiar with it, Maslows pyramid is a very nice model of the human condition:

Physiological needs: Requirements for survival such as oxygen, food and shelter.

Safety needs: For the body and the mind.

Need for love: Once we are sheltered and safe we want and need love, intimacy and friendship.

Esteem: Self-respect and respect from others.

Self-actualization: To realize ones full potential, could be by expressing creativity or pursuing knowledge.

As you can see in the pyramid illustration, the levels of both pyramids very much resemble each other: The presence experience can be dissected like the experience of being human. The needs described in these pyramids can be just as much fulfilled by computer-generated concepts as physical concepts can. Like an online social life or playing chess with a computer. And with all the levels are fulfilled, it doesn't really matter where you are: The experience is a whole. It is complete. Maybe the two pyramids could even be united into the basic human presence needs: all the requirements to be completely present in one or another world.

So presence can be mapped onto Maslow's basic human needs as van Velsen's pyramid shows. Physical presence is no longer required to be present or immersed.

A Mere Model

The book problem refers to the remarkable paradox that despite all of the advanced technologies we are using nowadays, the same intense experience of complete presence can be reached through the minimalistic means of reading a book and simply get immersed in the narrative.i One suggested key to this 'problem' is to increase acknowledgement for the role of the cognition, or so to say 'the consciousness'. Instead of treating the content presented in the media in the tradition of the philosophy of direct realism as a direct determinant of the presence experience, it is to be treated as only the raw source of the mental model that will derive from it. I feel a lot for the latter proposed solution. We'll explore it here. For this, the concept of the model is very, very important.

Whenever a computer program is about to be written, a conceptual model appears first. It includes all entities, their attributes, roles and relationships and set the boundaries of the simulated domain. To briefly show how models work, I formulated a very basic model of how a television works:

Signal comes in via plug - TV magic - show on screen

It is obviously oversimplified but it works. If there is no signal or the TV magic isn't happening, there is no show on TV. I think as a kid I worked with that model of how a television works for a long time, but as knowledge grows, the model can be adjusted to the new cognition:

Signal comes in via plug - cathode - anode - electron beam - phosphor coated screen.

It is a little more complicated and it still works. If there is no signal or a functioning cathode / anode / electron beam, or the screen broke, there is also no way you'll be watching the Bold and the beautiful.

We make models of everything, all the time. Not only of physical objects like that television but of your job, your relationships... everything. All we have are our models of the world, its attributes and a model of what is real and how "the real" works. Jay Wright Forrester, pioneer in computer simulation, put it like this:
"The image of the world around us, which we carry in our head, is just a model. Nobody in his head imagines all the world, government or country. He has only selected concepts, and relationships between them, and uses those to represent the real system."

There is one model in particular that I would like to discuss as it is to me key in understanding all realityconfusement: the mental model we have of ourselves. It is called, very to the point, the self-model. This self-model contains an image of ourselves and our global properties. It is like a window that connects our inner life with the world outside. It should be noted that one only looks through the window.. The window itself is not seen, for it is transparent.

The concept of the self-model is based on body representation. A striking illustration is to be found in the phenomenon of phantom limbs. Phantom limbs occur often after amputation of the original body part, when the owner still feels sensation in the bod ypart that is no longer there. Sometimes they can even still feel the watch or ring that was on it.[20] Even more peculiar are phantom limbs in people that are paralized or never had the phantom limb to begin with.[21] The self model is very much connected to the notion of ownership; your hand, your body, your own thoughts. It is also very easy to mess with, par example with the famous 'Rubber hand illusion'. There are approximately 28.600 recordings of this experiment to be found of this experiment on YouTube. For the sake of progress and not distracting you (of which the likeliness increases exponentially when on the internet) I shall give a brief recap:

When performing the rubberhandillusion-experiment, all you need are: a rubber hand, a screen and a human being. The screen is placed so that it keeps the test subjects hand out of the subjects sight while the rubber hand is within sight. The rubber hand and the hidden flesh and blood hand are simultaneously stroked. After approximately 90 seconds your guinea pig will start to experience the rubber hand as if it were their own. Nice variation to add to this experiment is setting the rubber hand on fire or threatening it with an axe. Most likely reactions to that will include fear and horror.
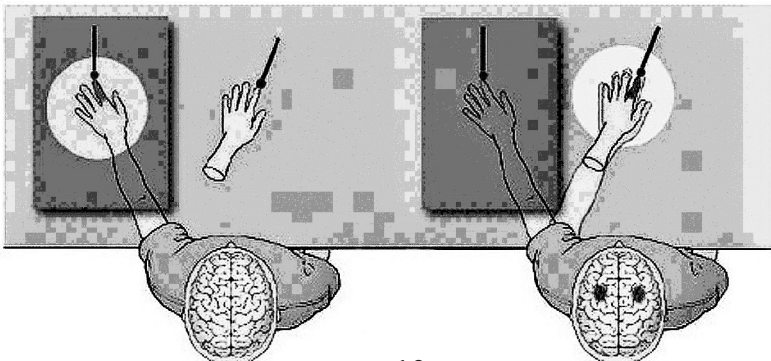
Taking this illusion to the next level increases requires a more expensive setup. But it's well worth it: The full body experience, for this one a camera, head-mounted display (HMD) and a tripod are required. And a volunteer.

The camera is ought to be aimed at the back of the test subject, with the output real-time displayed in the HMD so the guinea pig has a good look at its back. Then again, stroking. Give it a minute and yes indeed, the 'virtual' body will be experienced as if it were their own. Like in this example, as soon as the medium becomes invisible, identification will happen. Ask participants in this experiment are later on asked to point out their location in the room. They will be inclined to point out a position closer towards the location where they saw themselves (or their virtual selves) standing in the HMD, than their actual position.[22]
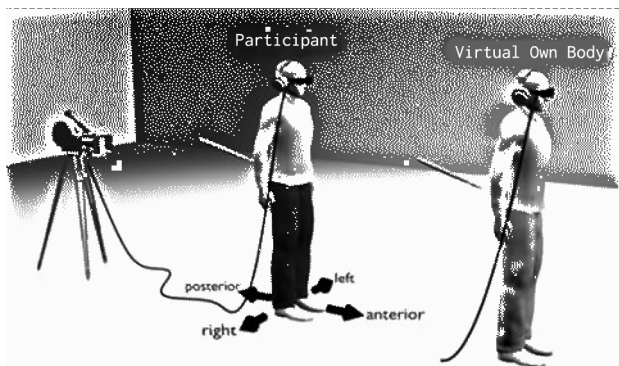
So the self-model that our consciousness hosts, is like a tower in which you reside. You see trough its window but you don't see the window, for it is transparent. You don't see your brain. But you do see what it constructs: an integrated model of reality. The medium through which information reaches us is something the consciousness is unaware of. Whether sound reaches your brain trough your ear or an auditory prosthetic; you hear it. The brain could be considered as a reality engine, it creates for you what is real or not. More poetically, we'd call it an ontology engine, in which ontology is the philosophy of being.

Have a look at the brain as a reality engine. Like visual images can be imagined, so can motor productions. With modern technology it is very possible to map a specific persons brain activity to their current actions. By applying that map of brain activity to another set of (remote) actions, the specific person can use brain activity to control elements outside itself. Rudimentary example could be controlling a cursor by thinking "up" and "down". As seen in interfaces for communication with completely paralyzed patients. To serve as an amazing example of technology it is however already outdated. Advanced experiments with motorimagination have been made to control robots while the test subjects were wearing a head-mounted display to actually see through the robots eyes (again, identification!).

Question arises whether we are now transposing into the robot or is it the robot that is transposing into us? I'd argue it is neither. If the entity that you are has the ability to control the robot and also your body, one could say that you are possessing both. We integrate the robot into 'the reality' and then possess it. Or to put it in the jargon of the previous chapter: you are present as the robot. This is all in strong contrast with the direct realism where our perception provides us with an accurate representation of the real. In the above theory the brain interprets whatever our perception provides us with and then creates what is real and what is not instead.

So the brain is like a reality-engine, it creates what is real or not, its input and output devices can be prosthetic or organic. You see through the transparent window from your brain.

Conclusion

Using the views of various scientists, philosophers, psychologists and writers I have been making my statement that there is barely a thing that makes sense as virtual reality or even reality. In my experience and opinion, they do not exist at all. When a second reality, a reality depending on the first reality, is involved with the first reality so much it even provides for survival in the first reality, there is no border between the two anymore. And they shouldn't be accepted as part of the first reality nor as the second but as the combination it is.

Hyperreality and reality co-exist as illustrated with photoshopped pictures and Second Life. They are irreversibly intertwined. The border is unclear and has faded with advancing technology. The concept of presence can be mapped onto Maslow's basic human needs as shown. Physical presence is no longer required to be presented or immersed in an environment.The brain is like a reality-engine, it creates what is real or not, input and output devices can be prosthetic or organic. You see through the transparent window from your brain.

We do all have a model of reality and some will have a model of virtual reality included, if the particular model of reality provides that. Mine doesn't. My model of reality is best compared to clay. One can make anything out of clay. It won't be the real deal but with the right skills and glaze it for sure will look like it.

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When working on this thesis I promised myself to adress
thank-you notes to:

JP
Gwendelyn Luijk
Priscilla Haring
Stijn Kuipers
Their beloved kitchen table
Irene de Craen
and most likely some more