





how to enhance virtual reality through real reality

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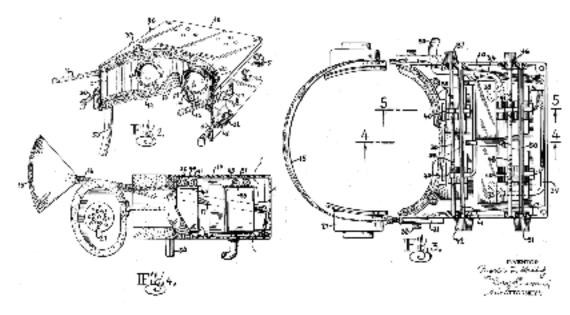
evolution of Virtual Reality

Virtual Reality is not a new invention we've never heard about before the 21st century. While Jaron Lanier coined the term Virtual Reality in 1989, Morton Heilig already experimented with location based VR in the 50's. His idea of the Sensorama, a "revolutionary Motion Picture System that takes you into another world" combined the three dimensional picture with the sensory perception of stereoscopic sight, spherical hearing, smell, touch and temperature. Also in the 90s Virtual Reality got reinvented – still inconvenient for the user.



evolution of Virtual Reality





LBVR in the 50s

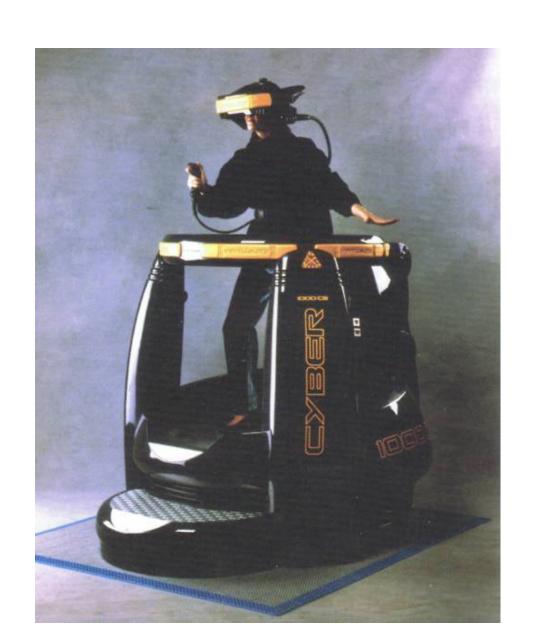


location-based VR in the 90s

Virtuality Group

Headtracking < than 50 milliseconds latency stereoscopic 3D four gamers simultaneously

but unaffordable and inconvenient





But as any media invention, also Virtual Reality is starting to become more convenient.



the evolution of media



source: Rori DuBoff



Virtual Reality will be more convenient





Virtual Reality will be enriched



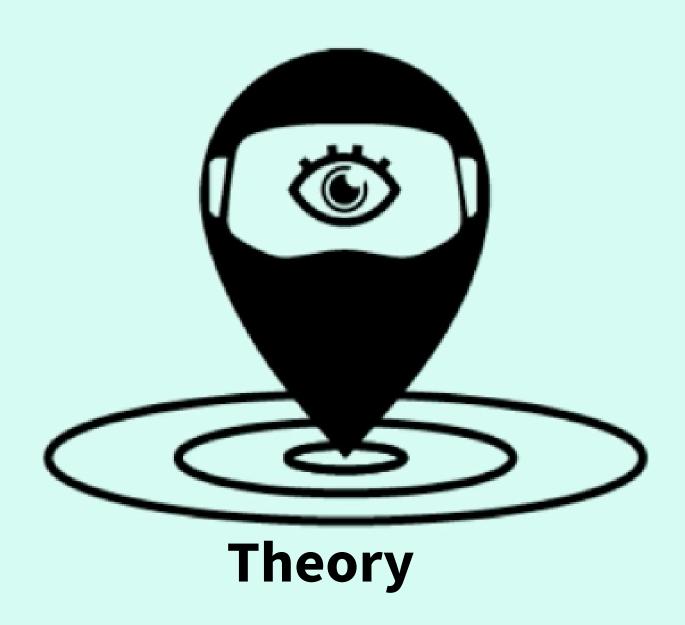
force feedback haptic motors kick in!



breeze via two powerful micro-coolers



Virtual Reality will be enriched. Enriched by technological ideas like *feelreal*, an extension for your Head Mounted Display, or *ultraleap* which creates haptic feedback via ultrasound. Means the locus of Virtual Reality is [still] a collection of machines, but a device-driven definition of VR is unacceptable for communication researchers. (Steuer, 1992)





Terminology

Virtual Reality

'Virtual Reality is electronic simulations of environments experienced via headmounted eye goggles and wired clothing enabling the end-user to interact in realistic three-dimensional situations.'



Terminology

Virtual Reality

'Virtual Reality is an alternate world filled with computer-generated images that respond to human movements. These simulated environments are usually visited with the aid of an expensive data suit which features stereophonic video goggles and fiber-optic data gloves.'

- Greenbaum (1992)

While most of the popular definitons of VR make reference to a particular technological system, Jonathan Steuer formed a theoretically useful concept out of Virtual Reality whilst defining VR as a particular type of experience: A concept of presence.



Terminology

Virtual Reality

'Virtual Reality is defined as a real or simulated environment in which a perceiver experiences <u>tele</u>presence.'

– Jonathan Steuer, Journal of Communication (1992); Defining Virtual Reality: Dimensions Determining Telepresence He further explains that presence, the sense of being in an environment with <u>natural</u> surroundings implicates the sensory input through the organs of sense.

"Presence is taken for granted: What could one experience other than one's immediate physical surroundings"

This changes when the perception is mediated by technology, because one is forced to perceive two separate environments simultaneously:

physical and virtual.



PRESENCE

sense of being in an environment | natural surrounding

+

ILLUSION

perceive something as something else

=

IMMERSION

transition from one state to another



IMMERSION

transition from one state to another

+

INTERACTION

movement

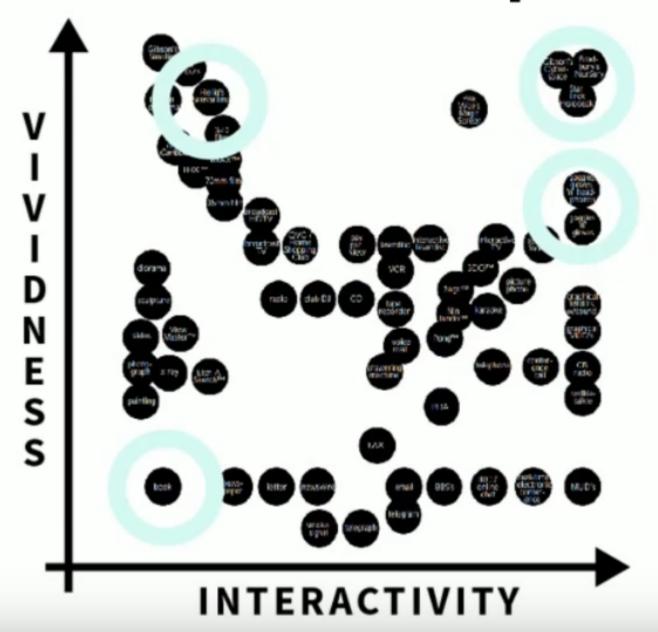
TELEPRESENCE

experience presence in a medium

To range the intensity of telepresence, Steuer created a Matrix, which is divided in the *vividness* and the *interactivity* of an experience. While vividness shows the ability of a technology to produce a sensorially rich mediated, stimulus driven environment, the interactivity represents the extent to which users can participate and influence the experience.



Steuers Matrix of Telepresence



(hot) high vividness through Sensory Apparatus

extern



Sight stereoscopic



Hearing spherical



Touch + Temperature



Smell



Taste

intern



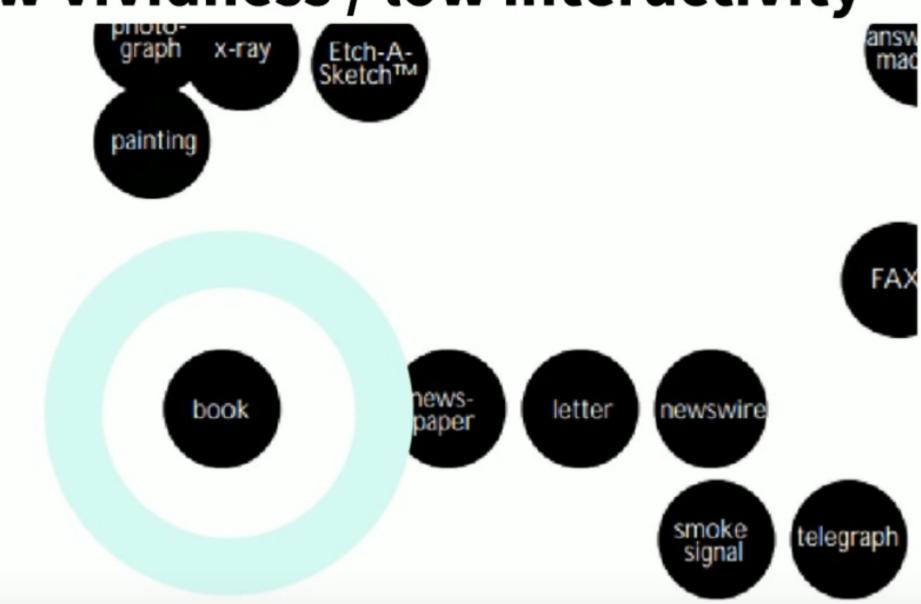
Balance

Proprioception sense of position of self & movement



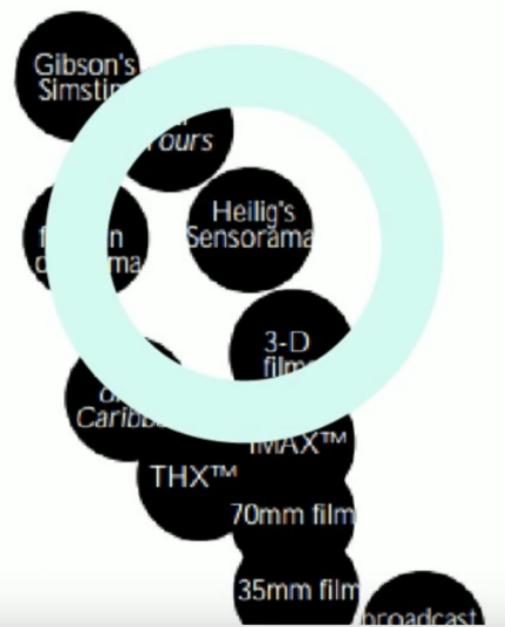
Nociception sense of pain

low vividness / low interactivity





high vividness / low interactivity





high vividness / high interactivity







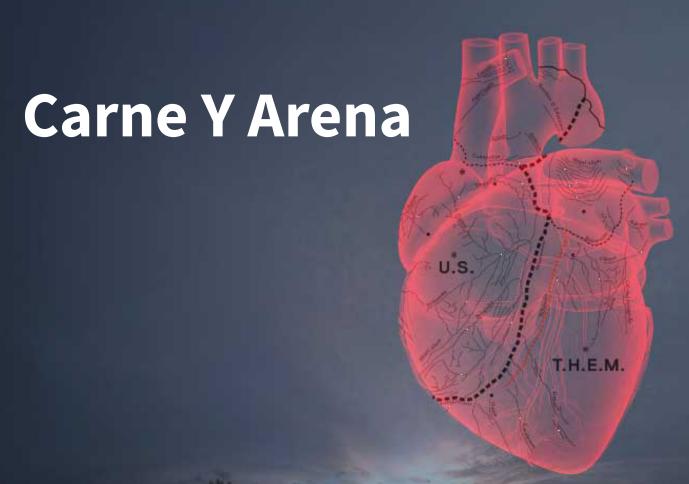
LBVR today







illustrate that with the example



by dissecting a participants experience



PRESENCE (sense of being in an environment)

I went into a dark room which floor is completely covered with sand

+

ILLUSION (perceive something as something else)

when I open my eyes again I'm standing alone in the half-light of the desert, somewhere between USA and Mexico

IMMERSION (transition from one state to another)

I am in a freezing room and I'm cold.

This space is based on the so called "icebox" ("hieleras") for refugees

+

INTERACTION (movement | interaction)

On the floor between cold, silver benches there were loose dirty and dusty shoes.

I also took my shoes off.

But as visitor I can decide on my own: Do I want to stand next to the refugees?

Do I want to look into the faces of the border patrol or do I want to turn around and ignore everything?

TELEPRESENCE (experience presence in a riedium)



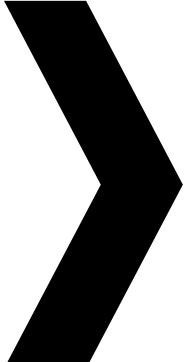
HIGH VIVIDNESS



By addressing the sensory apparatus

HIGH INTERACTIVITY

By decision-making and movement via body tracking



smooth transition between real reality and virtual reality



ILLUSION (perceive something as something else)
I am in a freezing room and I'm cold. This space is based on the so called "icebox" for refugees

+

PRESENCE (fact of Deing in a particular place)

I vient into a dark room which floor is completely covered with sand

LOCATED IN REAL REALITY...



... WHICH ALSO BOOSTS THE SENSORY APPARATUS

- SIGHT (STEREOSCOPIC)

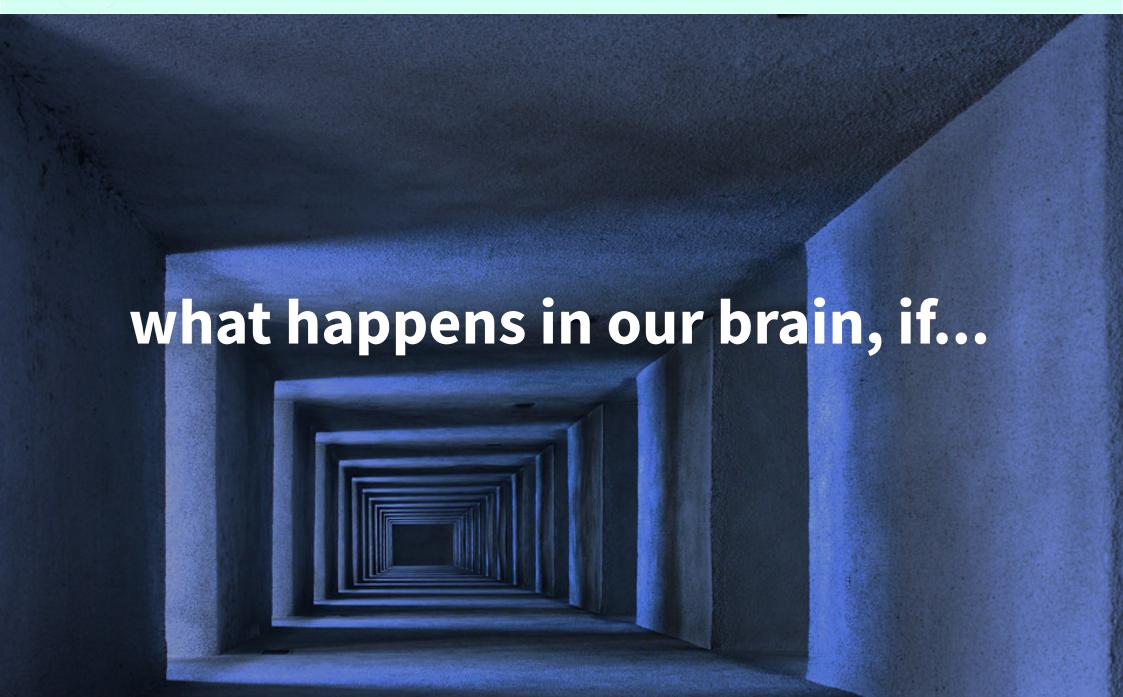
 I'm standing alone in the half-light of the desert, somewhere between USA and Mexico
 (Virtual Reality)
- HEARING (SPHERICAL)

 In the exhibition space a huge fan and heavy sound make me feel the helicopter, that's circling up in the air (Real Reality simultaneously to Virtual Reality)
- TOUCH + TEMPERATURE

 I am in a freezing room and I'm cold. This space is based on the so called "icebox" for refugees (Real Reality)

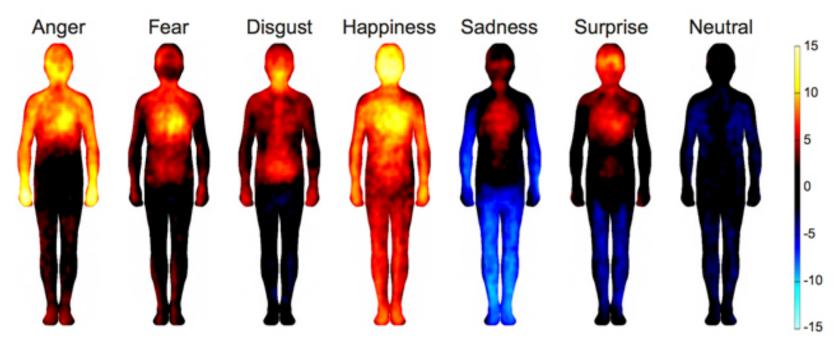
<u>In the exhibition</u> space a **huge fan** and heavy sound make me feel the helicopter, that's circling up in the air (**Real Reality simultaneously to Virtual Reality**)

The conclusion in this point is letting the illusion already begin in the real, or physical reality facilitates the possibility of experiencing telepresence. It also eases the localization of the sensory perception by perceiving it as naturally given through the artifical but naturally surrounding.





VR gives people a chance to take on a new body, and tricks the brain into exhibiting behaviors associated with that body.



Mel Slater, Mavi Sanchez-Vives and the philosophers Metzinger and Blanke worked together in an EU-funded project called Virtual Embodiment and Roboti Re-Embodiment from 2010-15. Studies by Mel Slater and Jeremy Bailensen have shown that if you're given a childs body in Virtual Reality, you start to show more childlike behaviors.

Means Virtual Embodiment tries to convince you that you are someone else, while the virtual body mirrors the movements of the real body via tracking.







2. physiological factors

- = the need to build a sensorimotor contingency between the [virtual version of yourself] and your own body to feel more embodied
- you move your real hand, and your virtual hand moves exactly the same. Or you see something touch your virtual hand and you feel something touch your real hand in the same way.

Dr. Sook-Lei Liew, Assistant Professor and head of USC's Neural Plasticity
 and Neurorehabilitation Lab

The neuroscientist Prof. Sook-Lei Liew adds in an interview with Tameka Lee for *thriveglobal* that a sensorimotor contingency between the virtual version of yourself and your own body is important to feel more embodied. Means linking the visual stimuli in VR with real world sensory stimuli helps you to feel more embodied in the environment.

This leads to an example named *The Unlimited Corridor*, which is using passive haptic feedback – feedback stimulated in real world – via visuo-haptic.

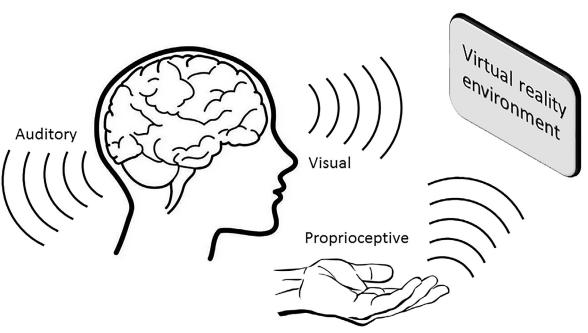


The Unlimited Corridor is a virtual reality system that enables users to walk in an endless straight direction within a small tracked space. The research team Dr Takuji Narumi, University of Tokyo and Unity Researcher Yohei Yanase therefore combined a redirected walking technique with visuo-haptic interaction and a path planing algorithm. In this experiment users grip a straight handrail in VR and a curved one in real reality at the same time.

what is visuo-haptic?

= a kind of illusory effect in our brain which allows for a particular perception to be generated by combining sensory inputs in different ways

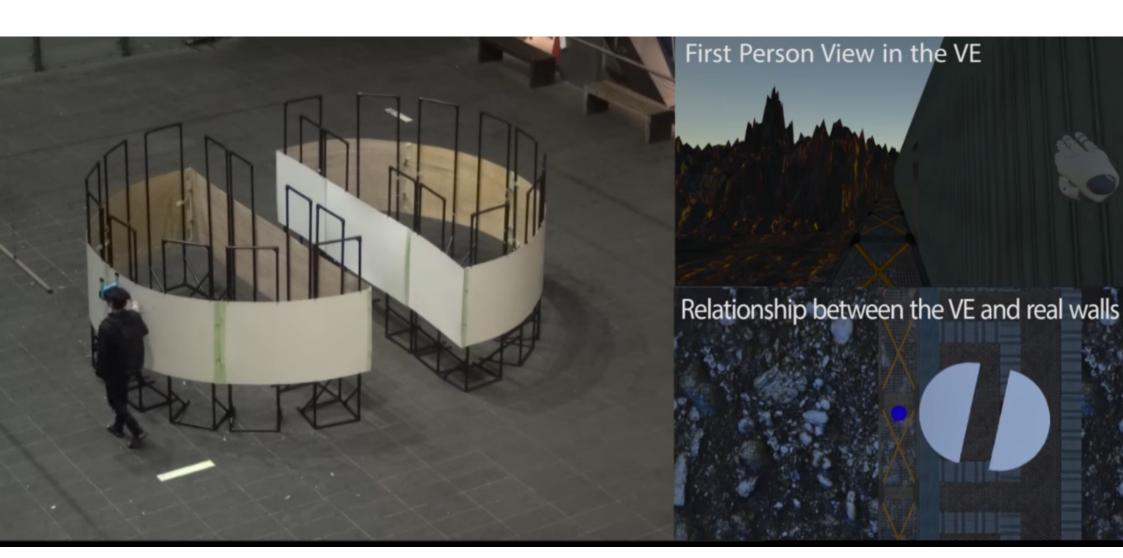
– Dr Takuji Narumi, University of Tokyo



Dr Takuji Narumi, University of Tokyo explains visuo-haptic as a kind of illusory effect in our brain which allows for a particular perception to be generated by combining sensory inputs in different ways. Quote "It alters our proprioceptive sensations corresponding to visual sensations by the combining to visual and haptic stimuli"

Means that our perception through one sense can change by other stimuli that are

Means that our perception through one sense can change by other stimuli that are simultaneously receipted through other senses.



Dr Takuji Narumi, University of Tokyo Unity Researcher Yohei Yanase

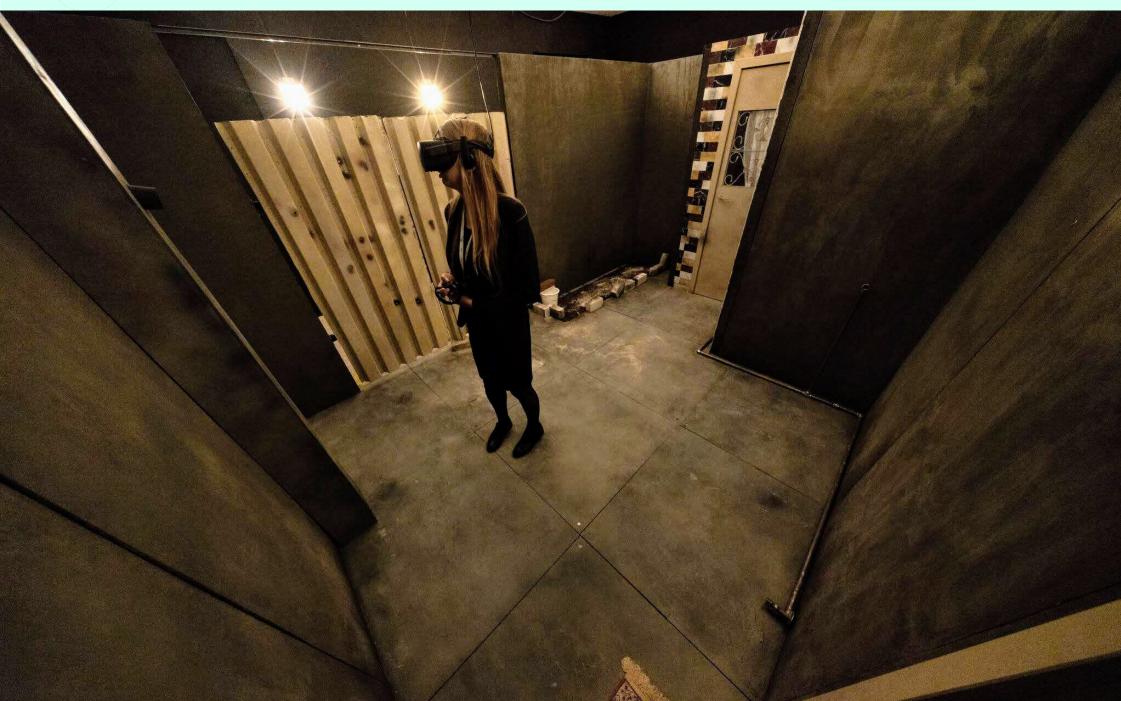
Explained by the example *the Unlimited corridor* users see a straight rail in the virtual environment and thereby perceive the curved handrail in real reality as straight, too. This is what increases the effects of redirected walking. The use of the sensory apparatus is what determines or at least enhances the experienced.











Venice Biennal, September 2018 A NowHere Media Production

Written and directed by: Gayatri Parameswaran

Executive Producer: Amy Seidenwurm

Creative Producer: Felix Gaedtke

Producer: Sandra Bialystok

Producer: Lauren Burmaster

Producer: Paula Cuneo

Production manager: Felix Gaedtke

Lead developer & UX designer: Anastasia Semenoff

Photogrammetry studio: Realities.io

Local producer & Translator (Iraq): Suadad Al Salhy

Director of Photography (360° videos): Felix Gaedtke,

Gayatri Parameswaran

Photogrammetry scans: Felix Gaedtke

Sound recordist: Ali Adnan

360° Editing: Gayatri Parameswaran

Post Production: Flight School

Music by: Leonard Petersen

Sound design: Studio am Fluss, Jana Irmert, Nils Vogel-Bartling

Voice over artist: Michael Matovu (Voiced by Mike)

Impact Producer: Catarina Gomes

Production assistant (Berlin): Mia von Kolpakow

Production assistant (Berlin): Felix Franz

Translator and transcriber: Amor Belhaj Salah

Translation assistance: Basma Elmahdy, Karim Ali

Narrative Installation: Trix

"Home After War" is a room-scale, interactive virtual reality experience that takes you to Fallujah, a city that was, until recently, under Islamic State (IS) control. The war against IS has ended but the city is still unsafe. There's one looming fear for returning refugees – booby trapped homes and improvised explosive devices (IEDs) in the neighbourhoods. Since the end of the war, thousands of civilians have died or been injured by IEDs.

Ahmaied Hamad Khalaf and his family returned home after the fighting subsided. In the experience, you find yourself in Ahmaied's home, which still shows signs of the damage from the war. Explore Ahmaied's home by either walking physically or teleporting in the space as he tells you his story about returning to a home that might be booby trapped.

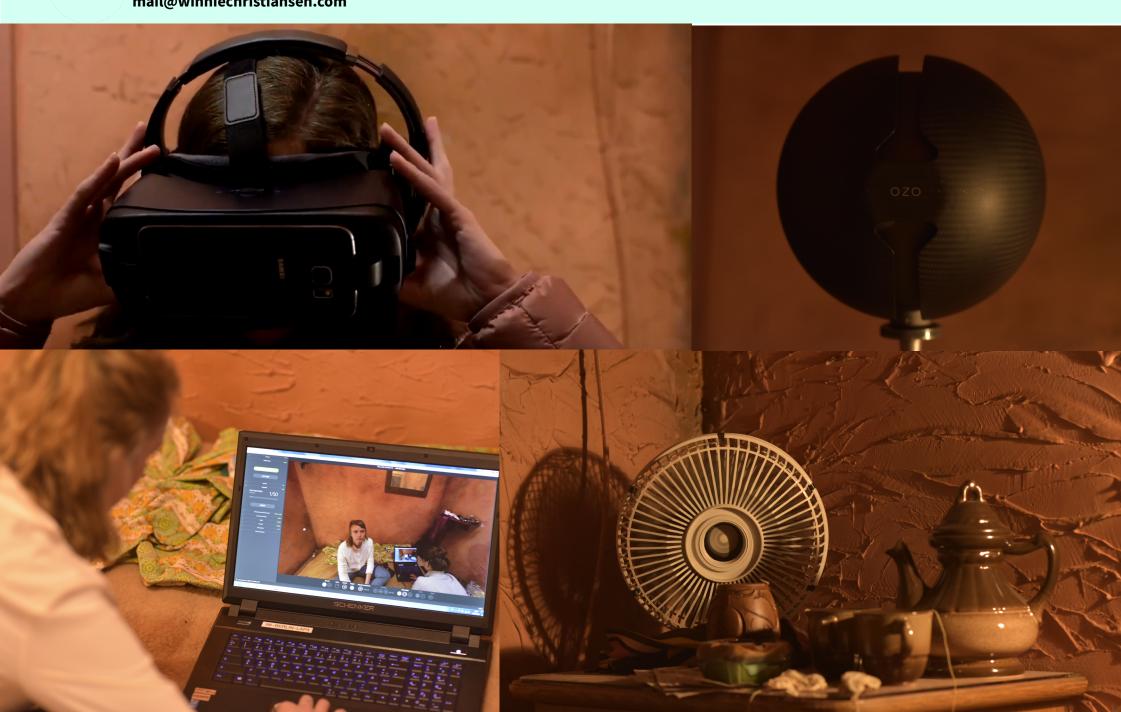
Witness life outside the four walls of his house through 360° videos embedded in the space. Hear Ahmaied speak of his loss and his hopes for his family, country and the world. Learn about what it's like to fear the home you once loved.

At Venice Biennal you could not only explore Ahmaied's home in a virtual environment but also in real reality. Therefore trix recreated the yard in 1:2. Whilst experiencing an explosion in VR you could also feel the shake in the flooring and smell the scent of gunpowder.



tRiX

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theHaus Berlin, May 2017

cooperation: trix

Invisible Room InVR.space

VR Business Club

techniques: 360° Video [Nokia Ozo]

& Narrative Space

producer: Carl White

director: Maren Demant

sounddesign: Jascha Dormann

scenography: Winnie Christiansen

"Auf der Schattenseite" is a location based virtual reality docufiction realised for the NGO International Justice Mission. IJM is a human rights organisation, rescuing slaves all over the world. Among others in India, where girls are forced to work as child prostitutes in run down brothels. By creating a reenacted scene and combining the strengths of analog and digital media for a multisensory virtual reality design, the creators come up with an experience that lets visitors truly dive into another world and forget where they actually are. This docufiction helped the NGO to raise awareness against forced prostitution in india.



Techniques:

custom developed 360° Headrig game engine [decision making]

Cast

Christian O. Wagner Hans-Günter Brünker Iris Lange

Artistic Production Managment Winnie Christiansen

Technical Production Managment

Maren Demant

Dramaturgy Corinna Duemler

Script Consultant | Direction Winnie Christiansen

Maren Demant

Concept Co-Developer

Kirsten Brandt

Cinematographer

Maren Demant

Setdesign

Barbara Lenartz Winnie Christiansen

Costume

Barbara Lenartz

Programming Martin Ortel

Sounddesign Roman Schönbichler

Camera Operator | Stitching

trx.media

Special Effects | 3D

Sascha Sigl

Graphic- | Interfacedesign

Julius Klaus



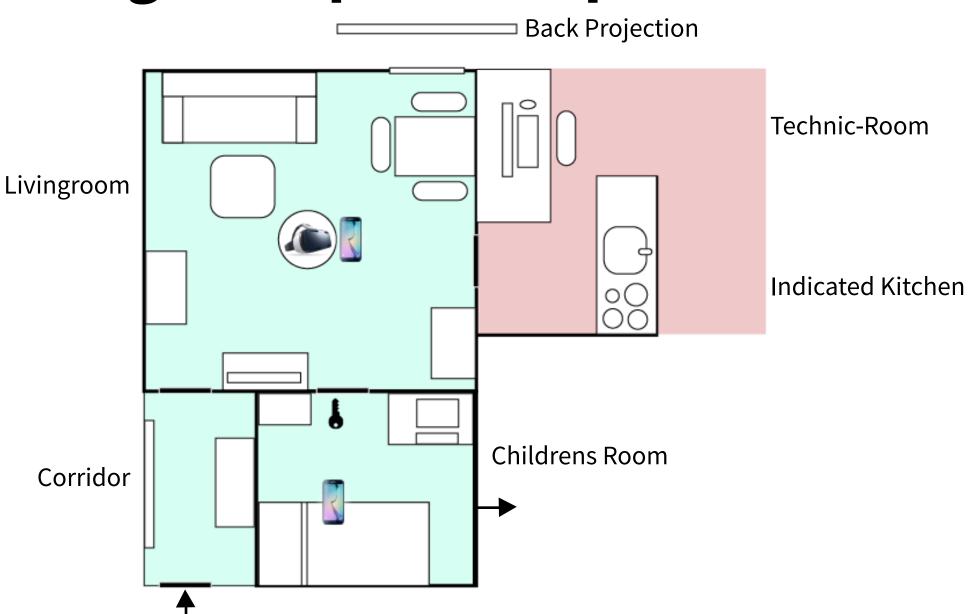
"Empfaenger Verzogen" has been the pilot project to work with physical overlaps in Virtual Reality. With 360° video scenes integrated in an immersive theater play, trix approached the traits of the social phenomenon Hikikomori. Therefore we developed a custom-made 360° Headrig for filming in POV. It's been important to see a body in VR when you're looking down on you because at some points the participant got touched on the shoulder or knee simultaneously in virtual reality and real reality. Scenes took place in the immersive theater play alternating with scenes in VR. While you couldn't make decissions in VR, despite the viewing direction, the participant was able to react on what he experienced in virtual reality in the theater play and thus could shape the story.

custom developed 360° Headrig for filming in POV | first person narrative





Stage setup & exemplification







Real Reality
Immersive Theater

Actors freeze put on the HMD

Virtual Reality
Actor resumes the play in VR



The combination of Virtual Reality and immersive theater brings me to the last point of this presentation:

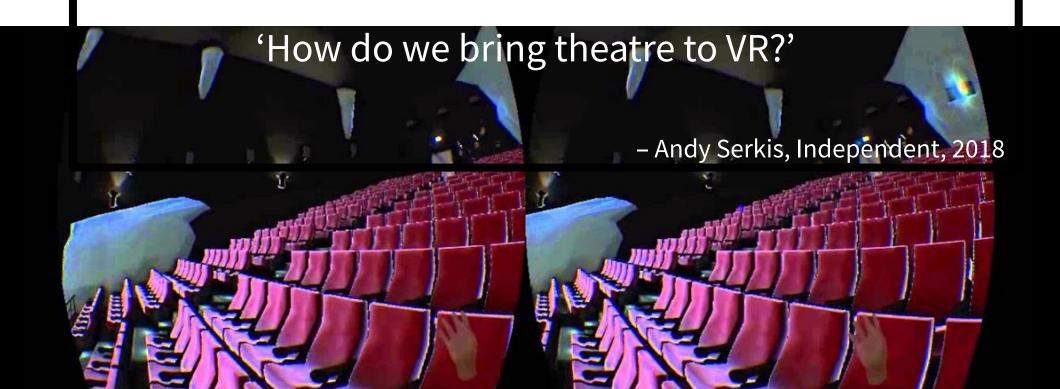
Storyliving.



Everyone has thought of it as

'How do we bring the film experience to VR?'

What I actually think we need to do is ask,





"I think when we're saying 'storytelling' we're putting on a cognitive toolbelt that belongs to a different medium. There is no teller in this sense, because it is a direct sensory experience. The storytelling is the retelling or reenactment of something that happened to someone else or something else, before. But VR is happening to you, here and now. I'm not saying 'storytelling' is a forbidden word, but using it anchors us into something that VR isn't."

- Ola Björling, Global Director of VR, MediaMonks,

STORYLIVING: AN ETHNOGR APHIC STUDY OF HOW AUDIENCES EXPERIENCE VR AND WHAT THAT ME ANS FOR JOURNALISTS

The term Storyliving is derived from a rich body of anthropological research on the concept of the "lived story". Multiple cross-cultural studies have identified social practices of people enacting or performing as mythical or spiritual figures to bring about perceptual transformations.



Storyliving

First Person Active Narratives

Telepresence

drawn on Immersion & Interactivity

>

On- and Off-Site

physical and / or virtual space



Enhancement of Attention Triggers

Impulse Guide Movement

Multisensory perception

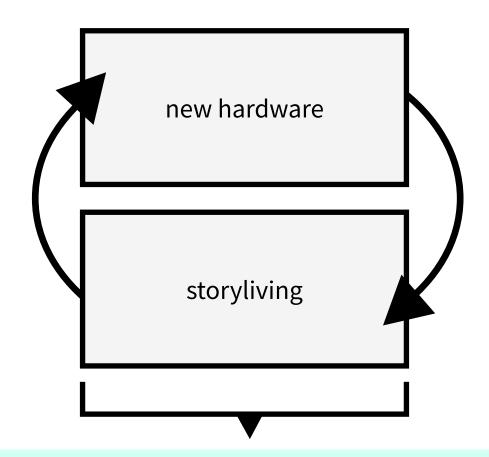
visual
haptic
tactile
auditive
olfactoric

What was shown so far were the particular steps for producing "a lived story". Of course any new invented Hardware is in need of ne methods of storytelling as well as storyliving needs to be guided by the provided hardware.



Mode of Operation

Tech-driven change in Storytelling



Documentaries | Journalism | Performance | Gaming | Advertisement | PR | Feature Films



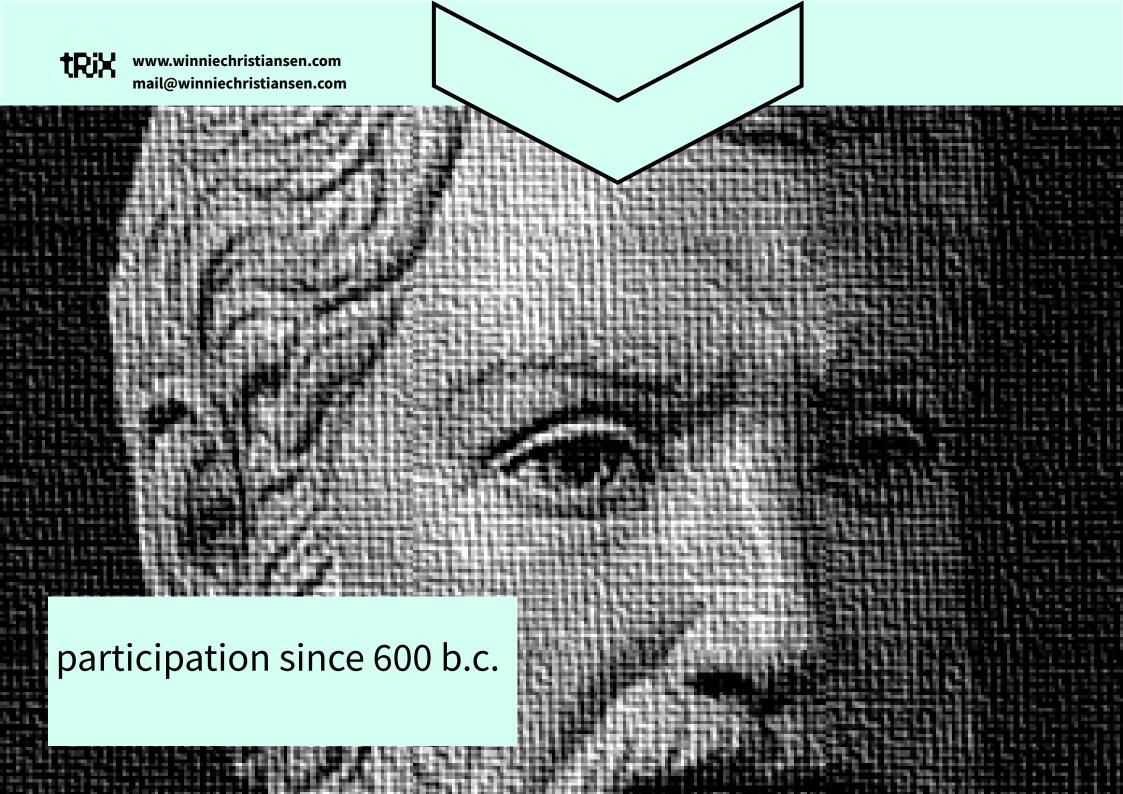
Interaction is the key

make use of concepts of Gameplay mechanics & Immersive Theater methods



deep digging

reasoning for interaction | participation in mediated situations





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source: https://www.thenation.com/article/archive/racial-justice-is-the-key-to-democracy-reform/



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