Video Game Spaces: Image, Play and Structure in 3D Worlds (2008) by Michael Nitsche

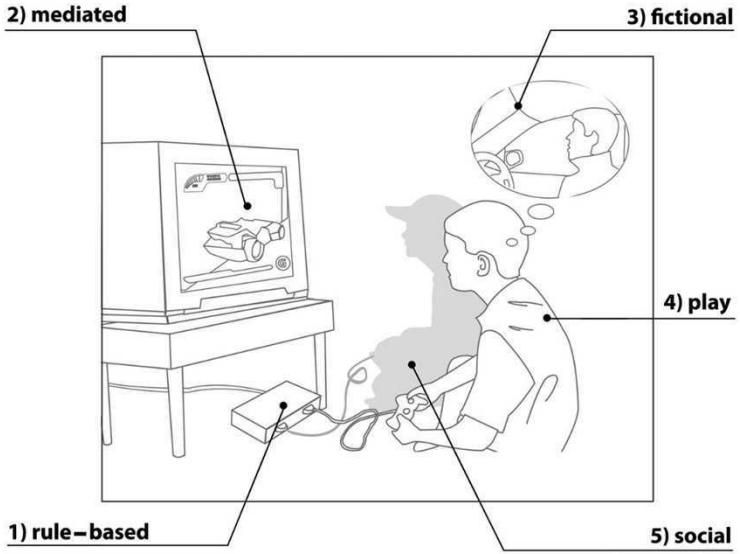
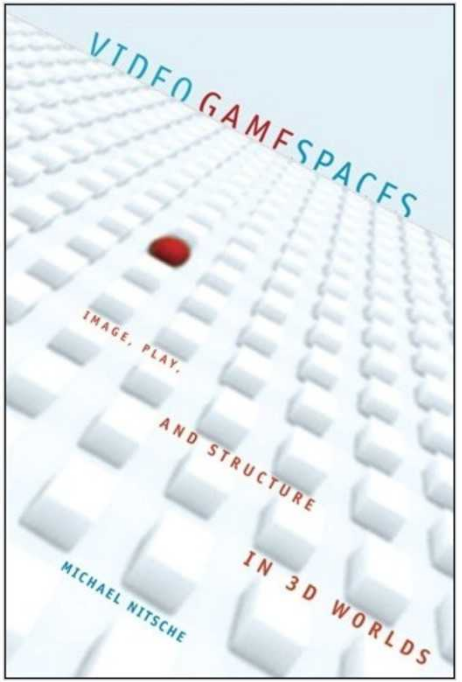


Figure 1.1 Five analytical planes



Video Game Spaces by Michael Nitsche

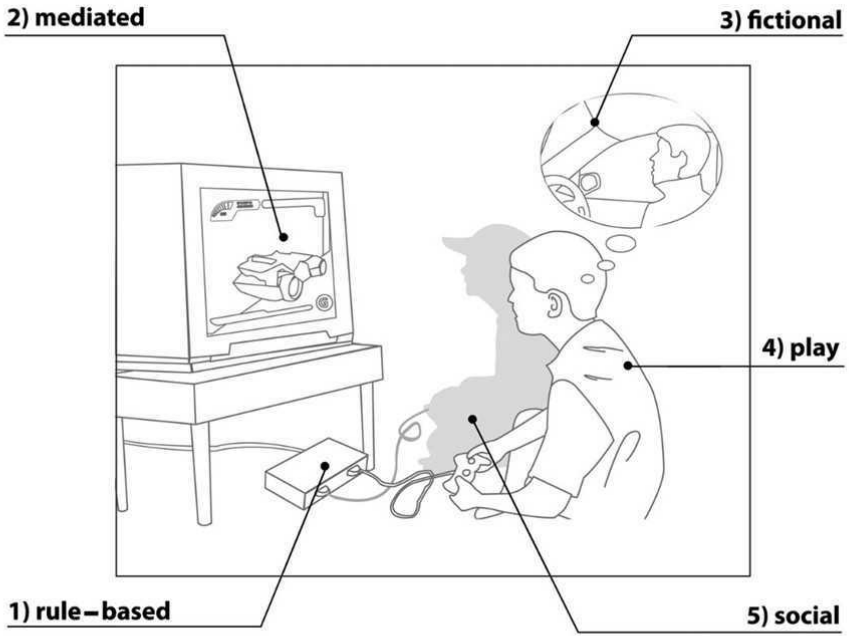


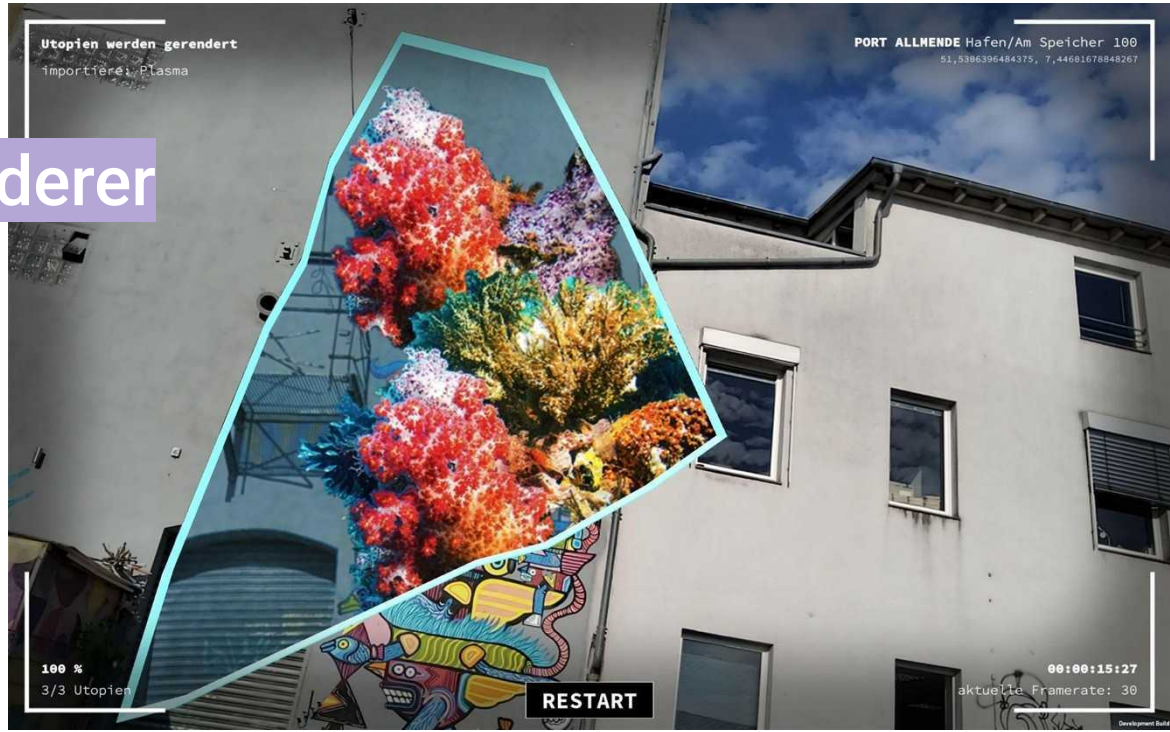
Figure 1.1 Five analytical planes

1) mathematical rules, code
2) audiovisual representation
3) imagination of the player
4) interactive performance
5) social and cultural extension of the game

Case Study: Utopien-Renderer

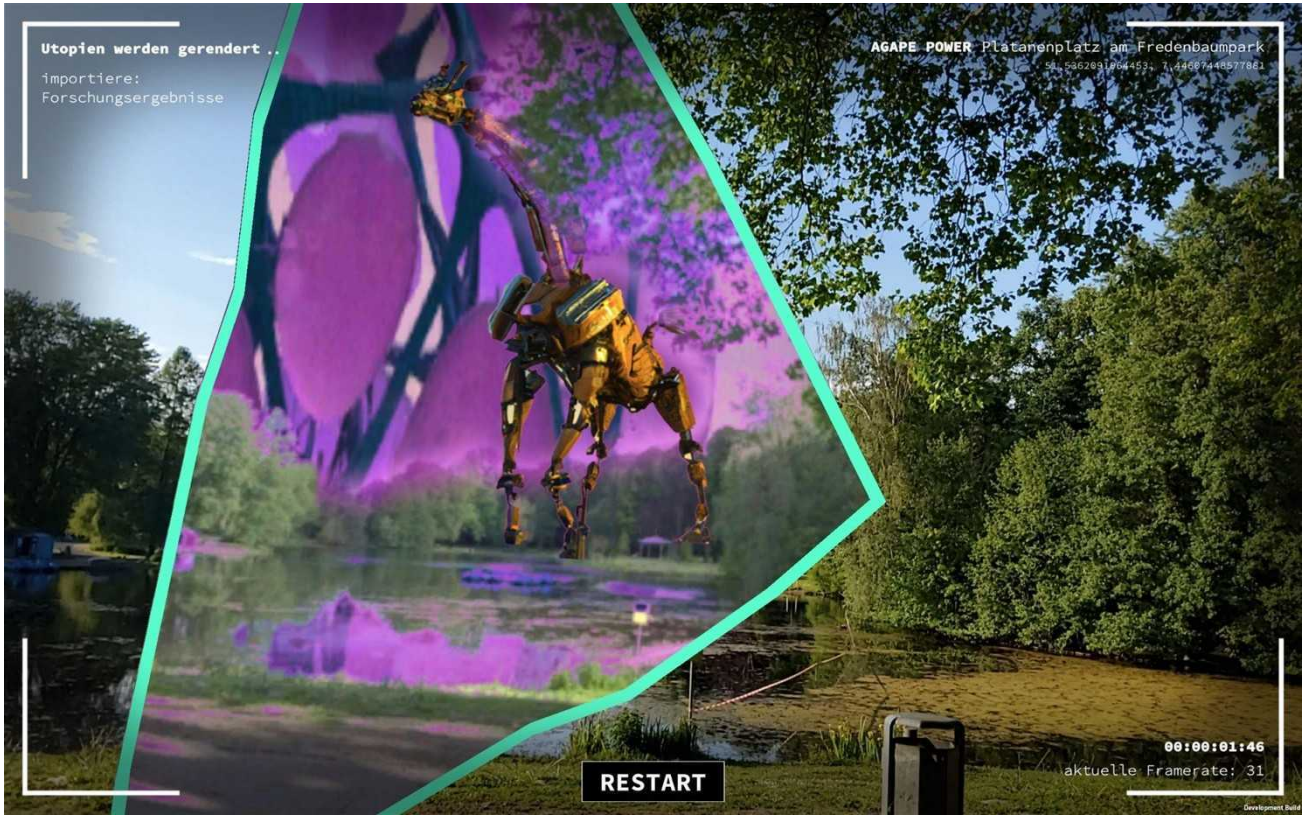
105 x 68. Wir regeln das. Theater Dortmund

Der Utopien-Renderer



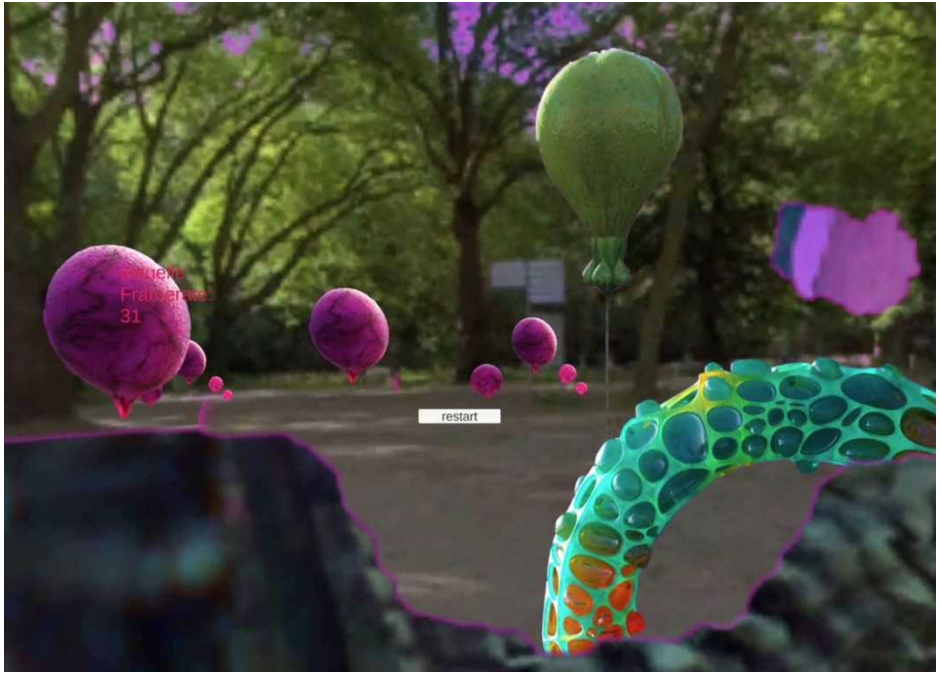
Premiere: 4. June 2022 | Theater Dortmund
Concept and Directing: Christiane Hütter
Augmented Reality: Sarah Buser, Judith Hanke
Stage: Cordula Körber
Currency App: Michael Sträubig, Kolja Kleinschmidt
Video: Daniela Sülwold, Tobias Hoeft
Dramaturgy Kirsten Möller
a Theater Dortmund production

Der Utopien-Renderer

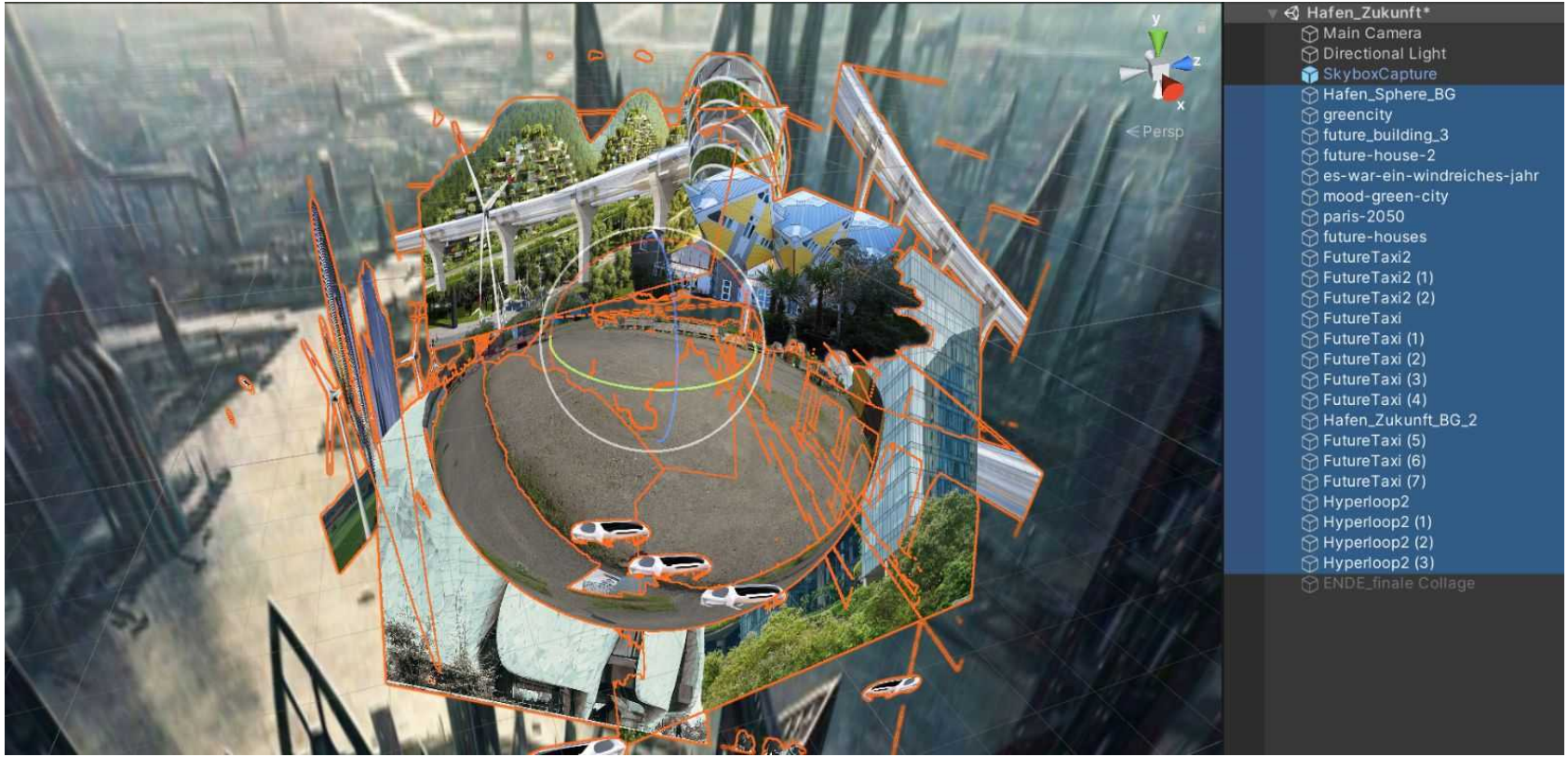


360 fotos & image collage

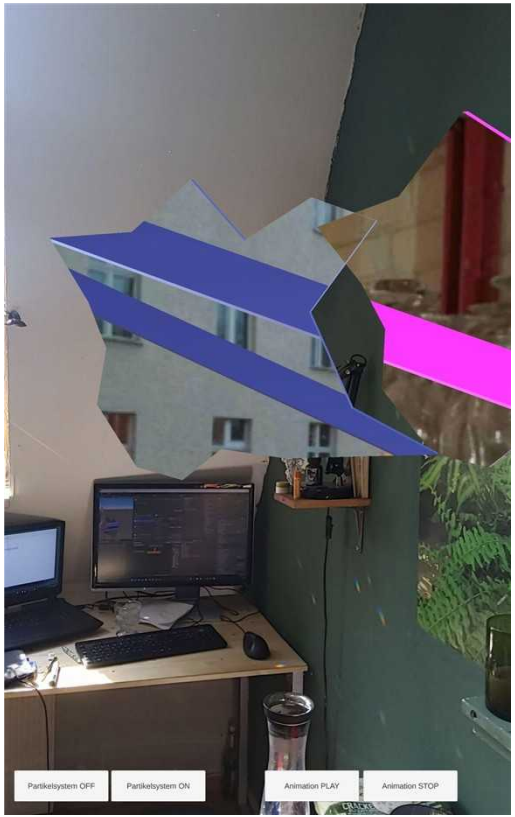
360 fotos & image collage

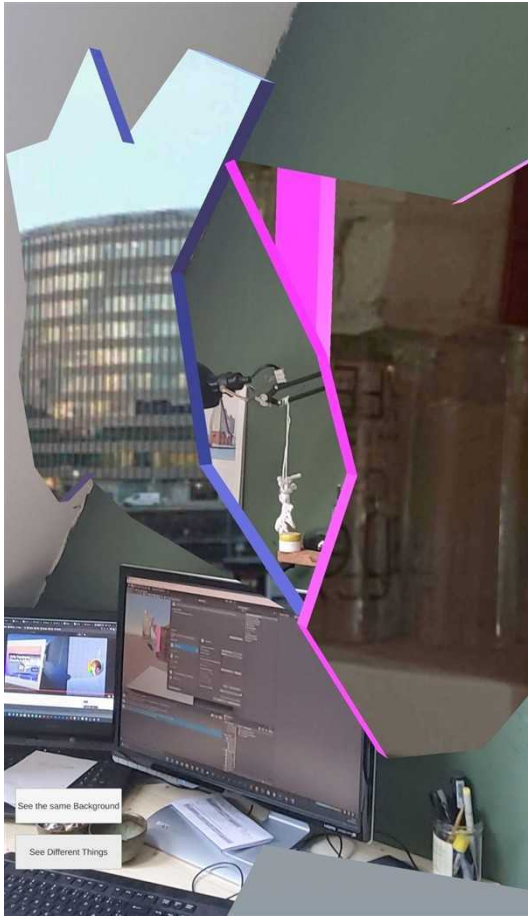


Perspective Setup in Unity

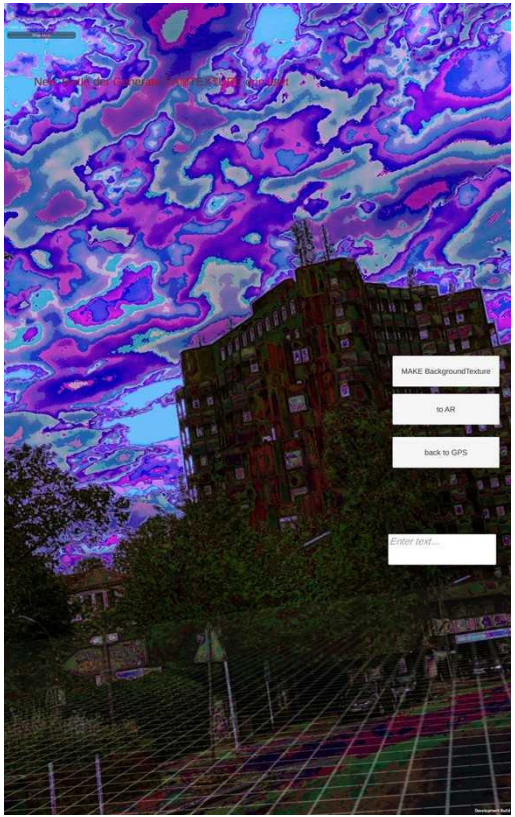


Stencil Shader for Shard





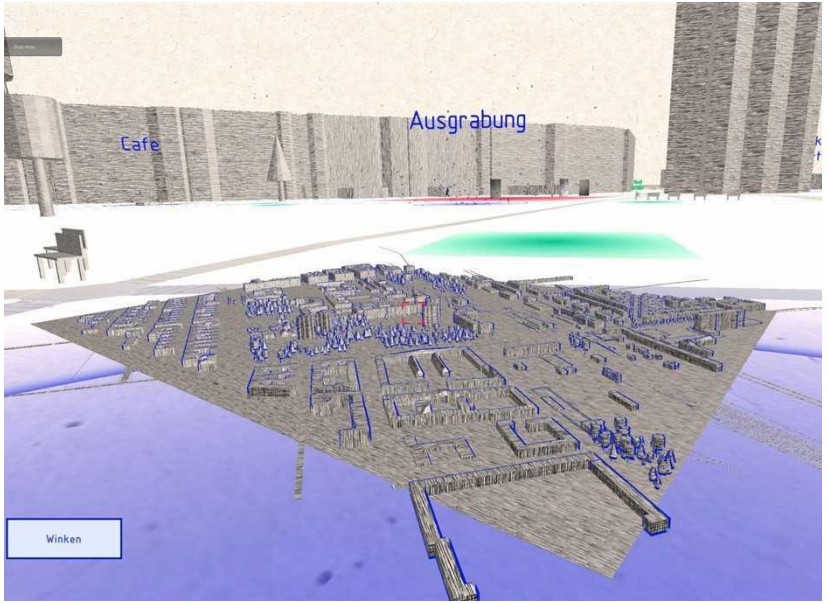
Modifying AR Background



Case Study: INBETWEEN

INBETWEEN - Die Andere Stadt

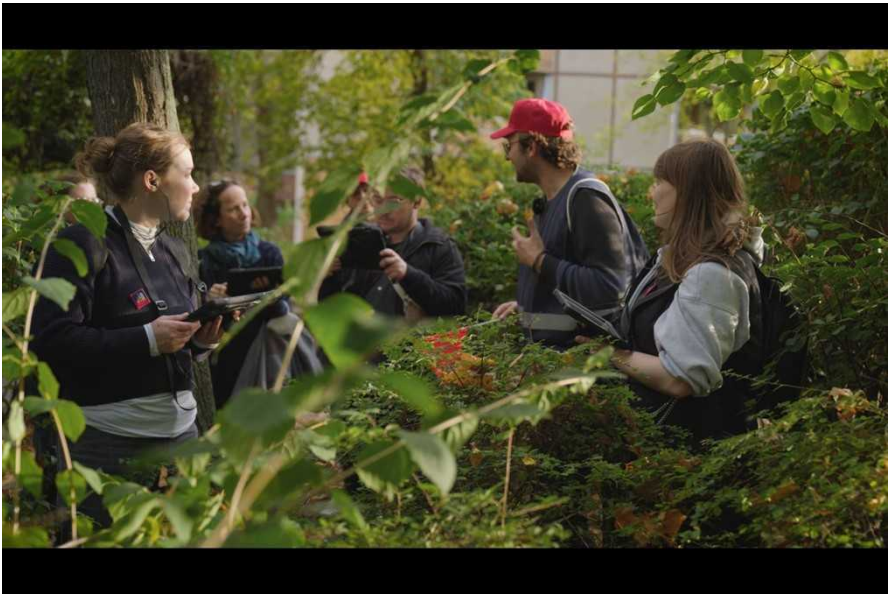
location based AR Multiplayer Theater



Premiere: Autumn 2022 | Schaubude Berlin | Artistic Direction, Code: Sarah Buser | Game-Design, Acting: Caspar Bankert | 3D-Design, Illustration: Tomás Montes Massa | Dramaturgy: Anna Vera Kelle | Artistic Collaboration, Code, UI-Design: Judith Hanke | Acting: Annalena Steiner | Video: Panther Reh

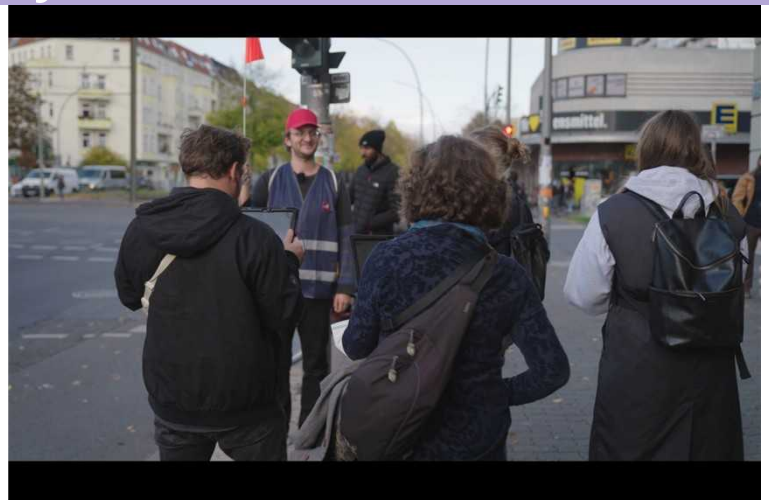
Two Groups

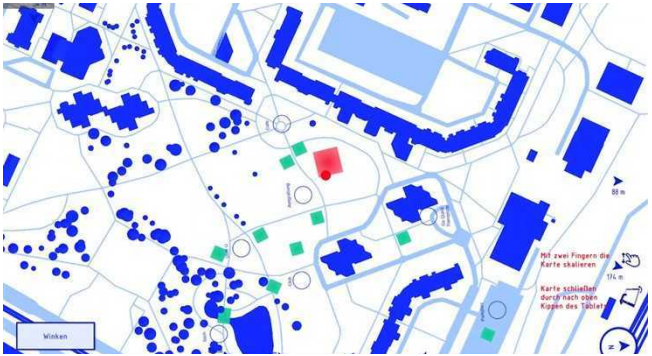
“City -Tour” in Berlin Park, with Augmented Reality Tablet

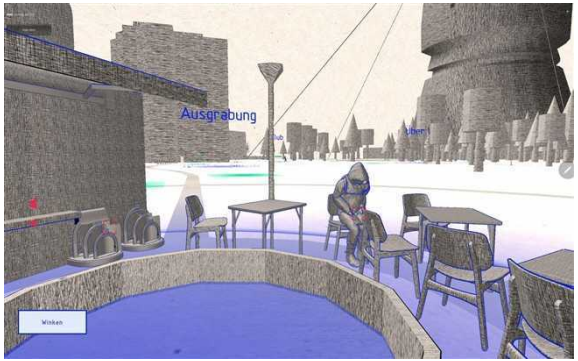


Hideout of the Resistance, “Virtual Reality” on Desktop Computer

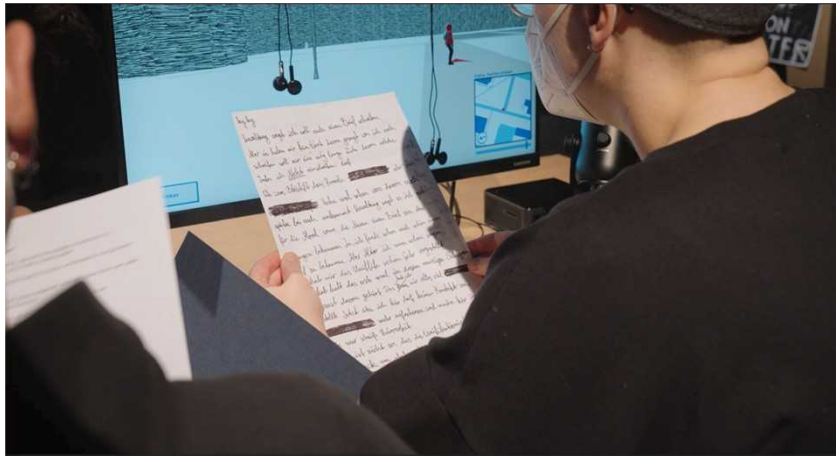
City Tour - Ernst Thälmann Park

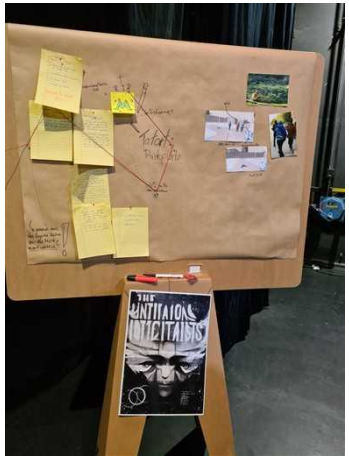




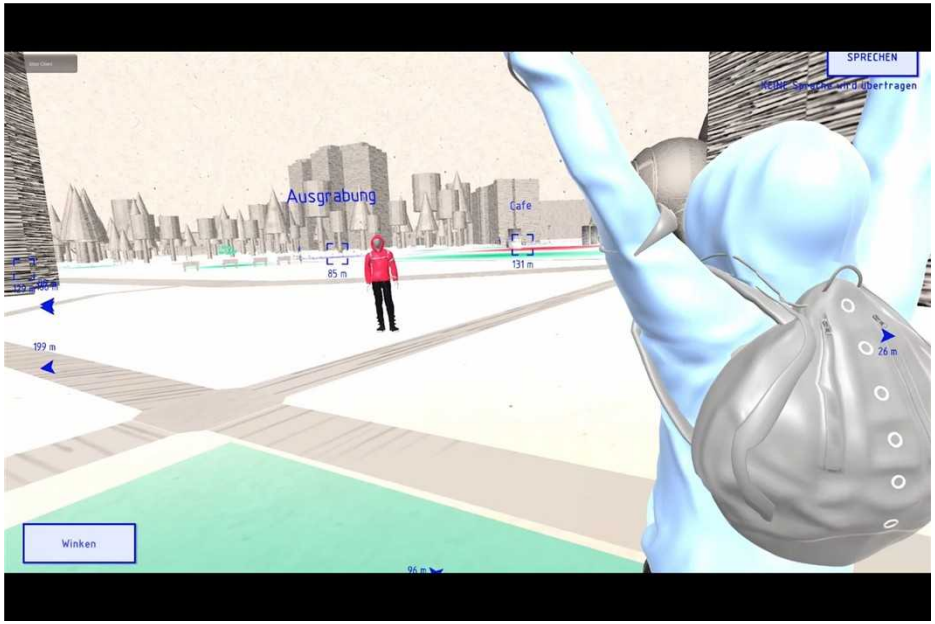


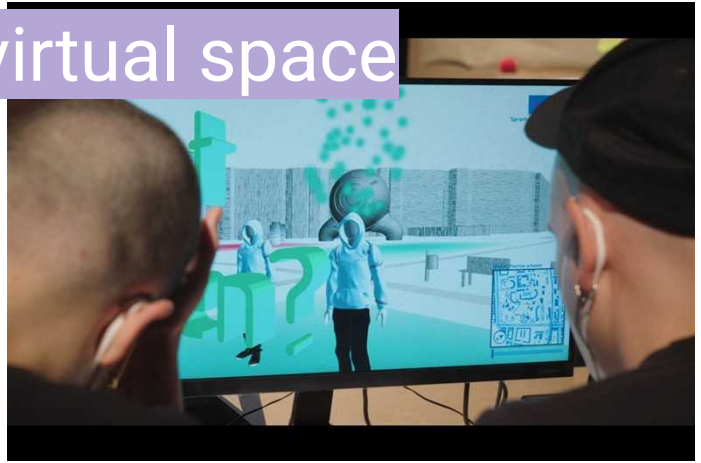
The Resistance- in Theater Venue



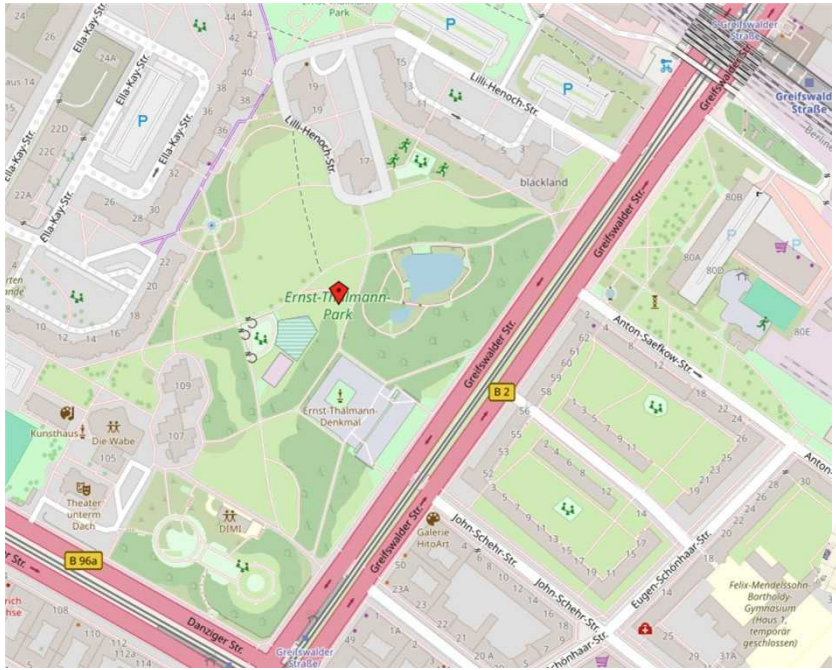


Communication in shared virtual space





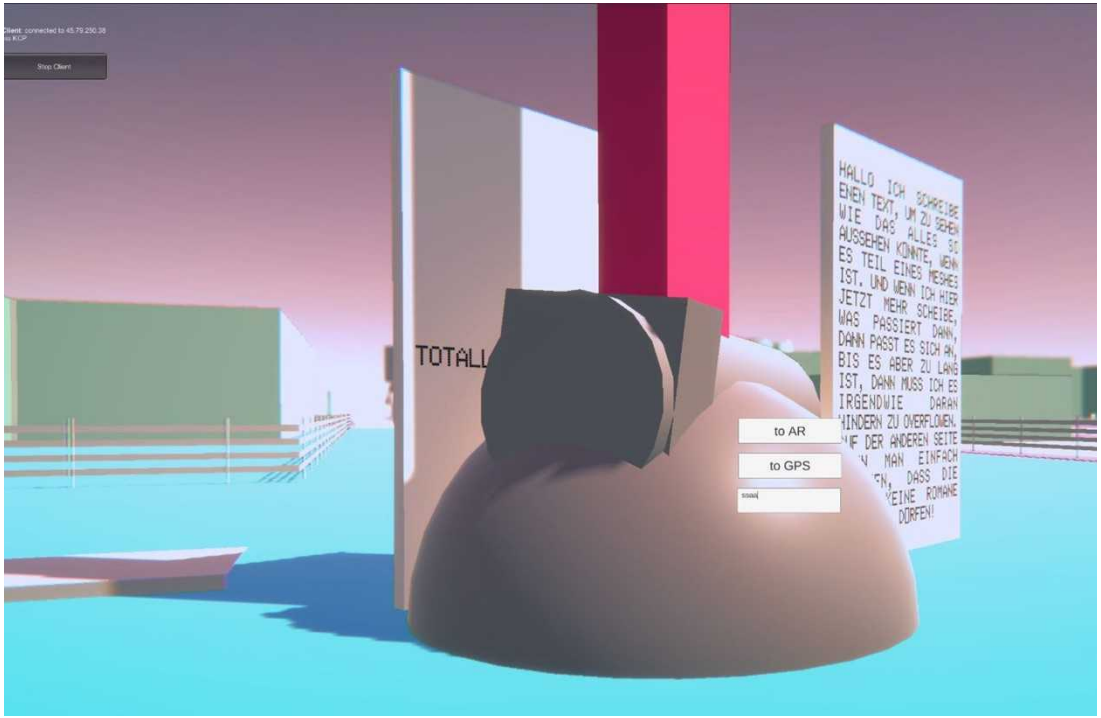
Shared Virtual Space



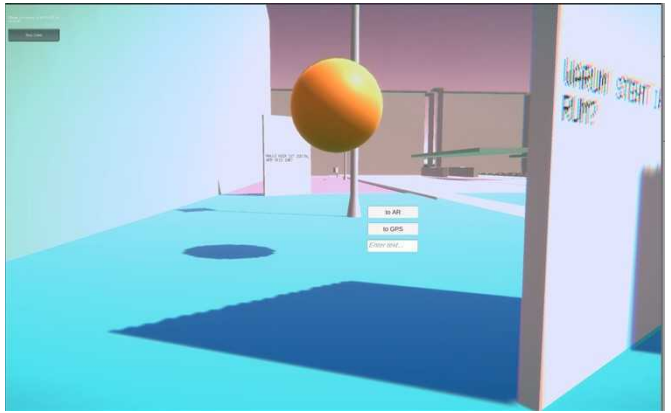
https://www.openstreetmap.de/karte/

3d Model in Unity Scene

Technical Prototype



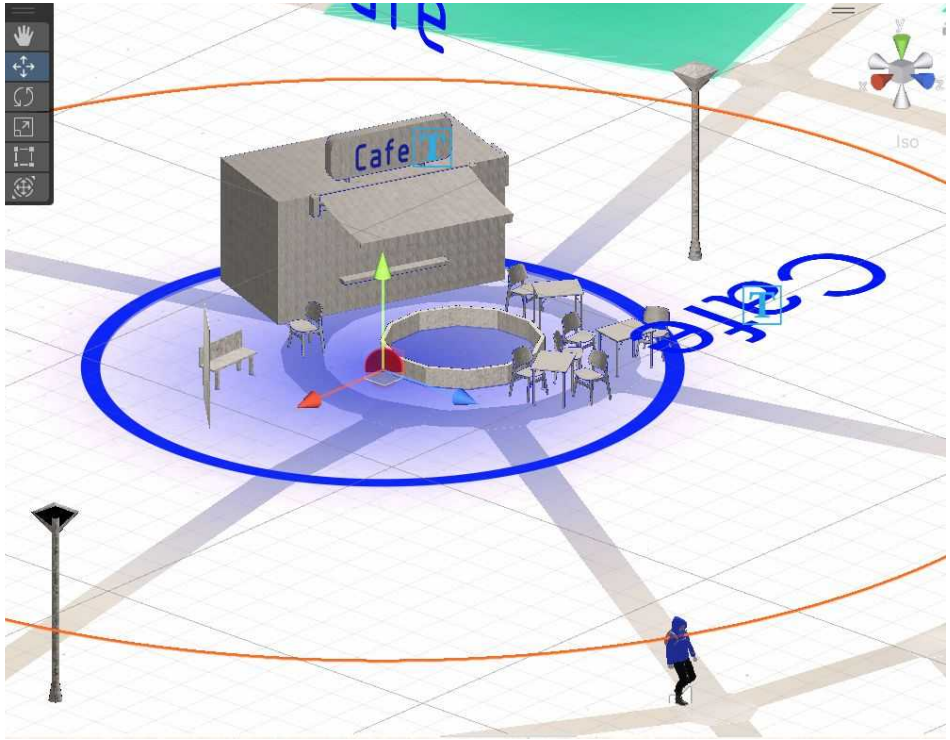
- Connecting GPS Coordinates with Unity Coordinates
- Network Transforms
- Networked Writing
- Scouting interesting Places IRL

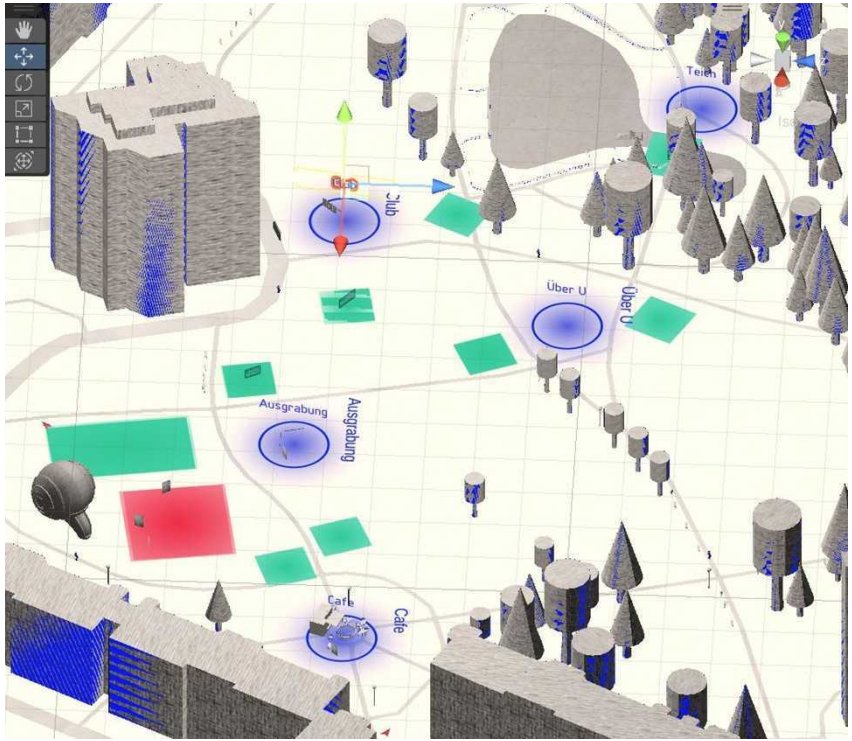


Playtesting and Iterations

- Testing interaction with people that don’t know it yet
- Figure out bugs
- Figure out what is understandable, what isn’t
- figure out how they interact with the system
- like rehearsing in theater

Implement Assets / Polish Scene





Design Challenges for Virtual and Augmented Reality

Narrative
Embodiment
Locomotion
Physics
Interfaces
Accessibility
Hardware
further considerations

World Space
Screen Space
Interaction
Accessibility
Hardware
Audience
further considerations

Virtual Reality

all Design Challenges Slides inspired by Alexander Walmsley

Design Challenges for Virtual Reality

VR Design Challenges

Narrative

- attention economy
- non-linear storytelling
- first person perspective
- pace / speed

VR Design Challenges

Embodiment

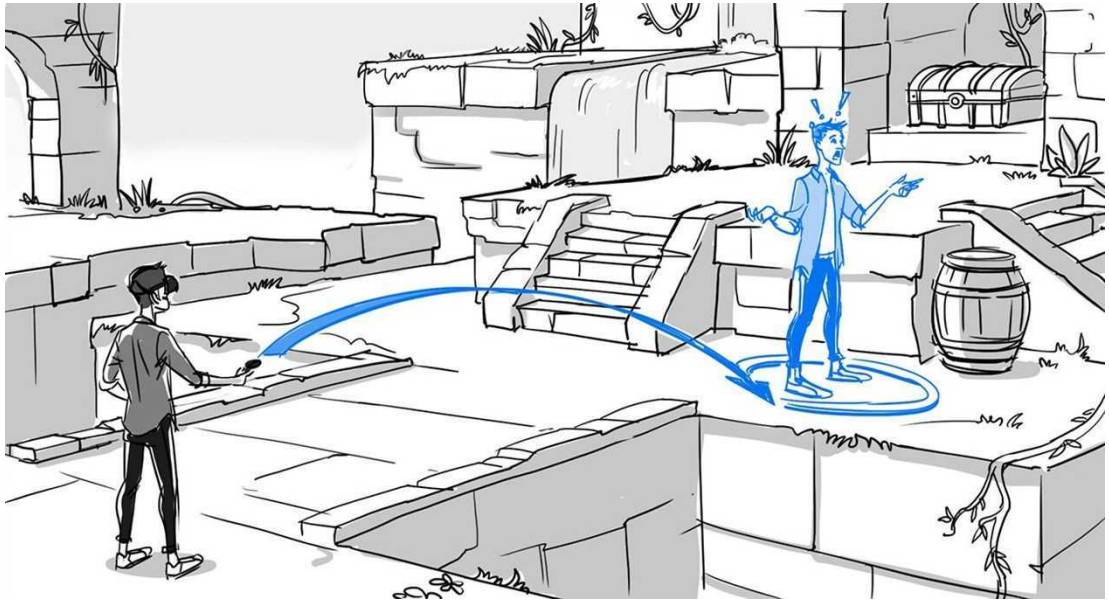
- physical body in virtuality
- representation of body in virtuality
- include other senses

a machine to be another, https://beanotherlab.org/home/work/tmtba/body-swap/

VR Design Challenges

Locomotion

- save and intuitive movement
- include locomotion into the narrative (fish hook, magnifying glass, etc.)
- locomotion as freedom



Source: meta

VR Design Challenges

Physics

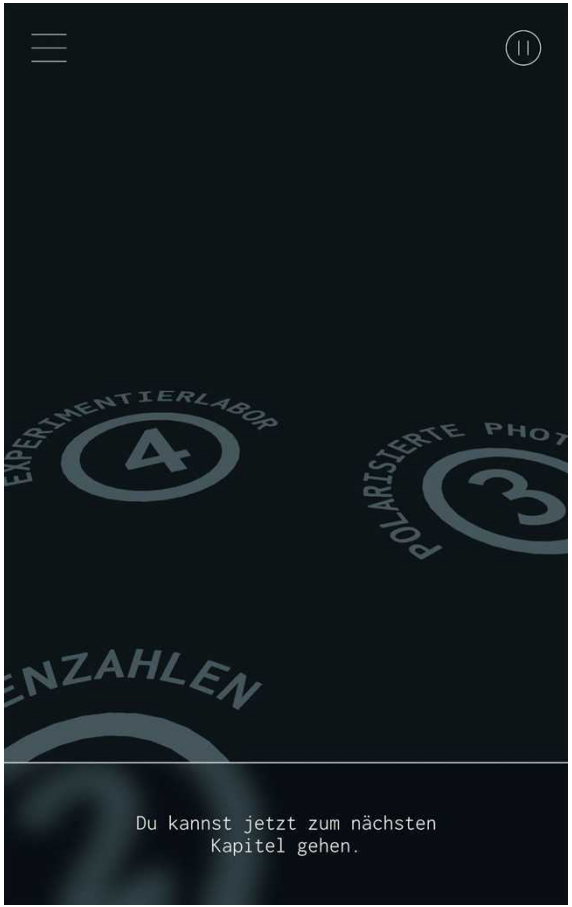
- interact with / act into the virtual world
- rules of the virtual world VS the physical world
- gap/dissonance between physical experience and virtual experience

Slaap Lekker by Jeffrey van de Geest,© MaxGrosser

VR Design Challenges

Interfaces

- Integration of Information without using flat screens placed in 3D world?
- navigation between different parts/chapters/scenes of the experience
- integrating 2D panels into the 3D world OR “navigating” the interface with your body OR …?



spatialized chapter navigation in “Quantenwelt” by Sophie Kirchner

VR Design Challenges

Accessibility

- Onboarding
- Awareness of the isolating effect
- how to integrate instructions into the experience/narrative
- assistance / support during the experience

VR_I: Jilles Chobin (2017): https://vimeo.com/246280660?fl=pl&fe=vl

VR Design Challenges

Hardware

- diverse hardware requirements for a VR experience
- adapt experience to different hardware with different capabilities
- optimise experience for mobile devices with limited performance

A VPL (Virtual Programming Languages) Research DataSuit, 1989. Source: wikipedia

meta Quest 3, Source: meta

VR Design Challenges

further considerations

- distribution
- archiving
- stage the physical space around the vr experience
- integrate the VR Device into the experience
- linking VR with other hardware/software

Mundo Pemón by Ana Lodeiros Lorena Velasquez

© Marshmallow Laser Feast

Augmented Reality

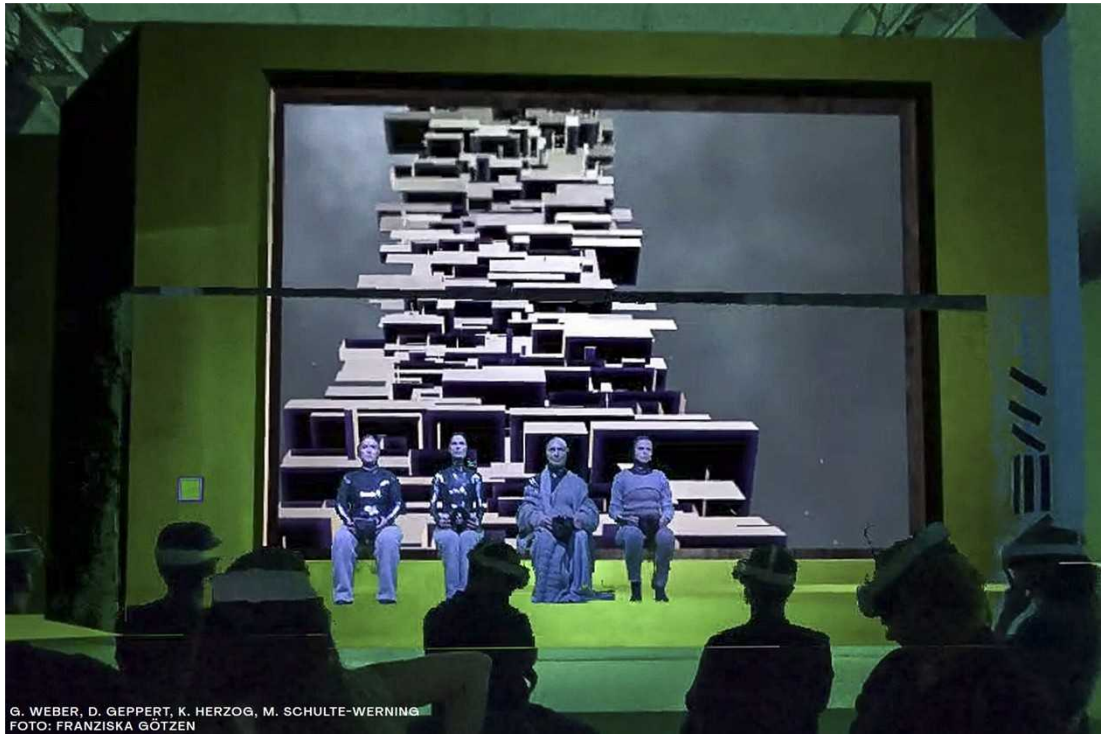
all Design Challenges Slides inspired by Alexander Walmsley

Design Challenges for Augmented Reality

AR Design Challenges

World Space

- mapping virtual objects onto the physical world
- advising audience in the physical space
- size and scale of AR objects
- adding physical elements in the physical world for the AR objects to work
- the physical world is stronger (cars, weather, general public)

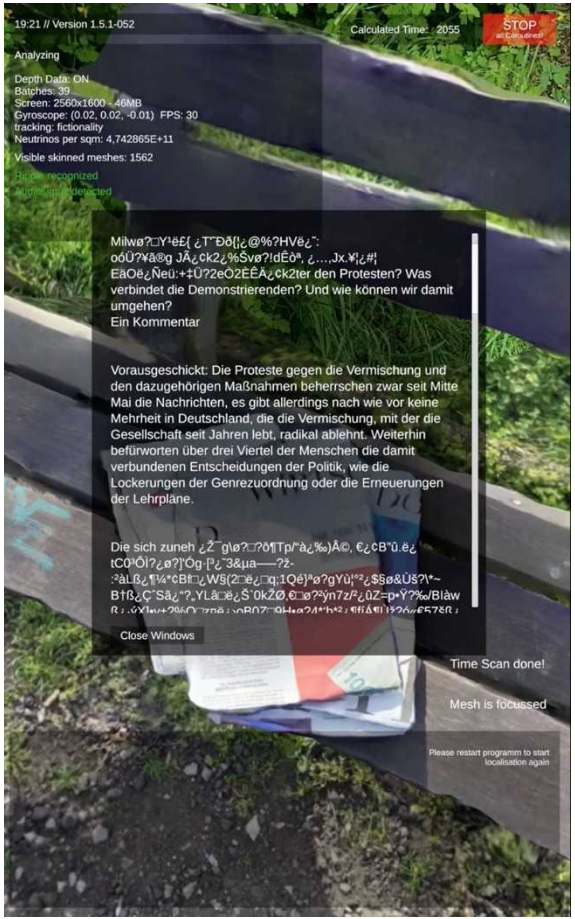


Antropka by Maria Vogt:
https://www.theater-an-der-ruhr.de/de/programm/stuecke/8096-antropka-ua

AR Design Challenges

Screen Space

- in AR the frame is the screen is also the interface
- 2D (UI) and 3D (Augmented Physical World) compete for attention
- UI in 3D space, as 3D located panels OR dividing semantic layers
- directing the eye in these two different (overlapping) spaces

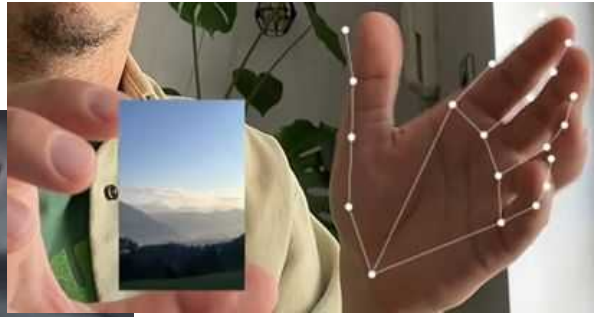


Erzählkapseln, 2023

AR Design Challenges

Interactions

- traditional mobile phone screen interactions VS new kinds of interaction (walking around the room, instead of zooming in/out o the screen)
- using devices/sensors/hands as input devices
- physics



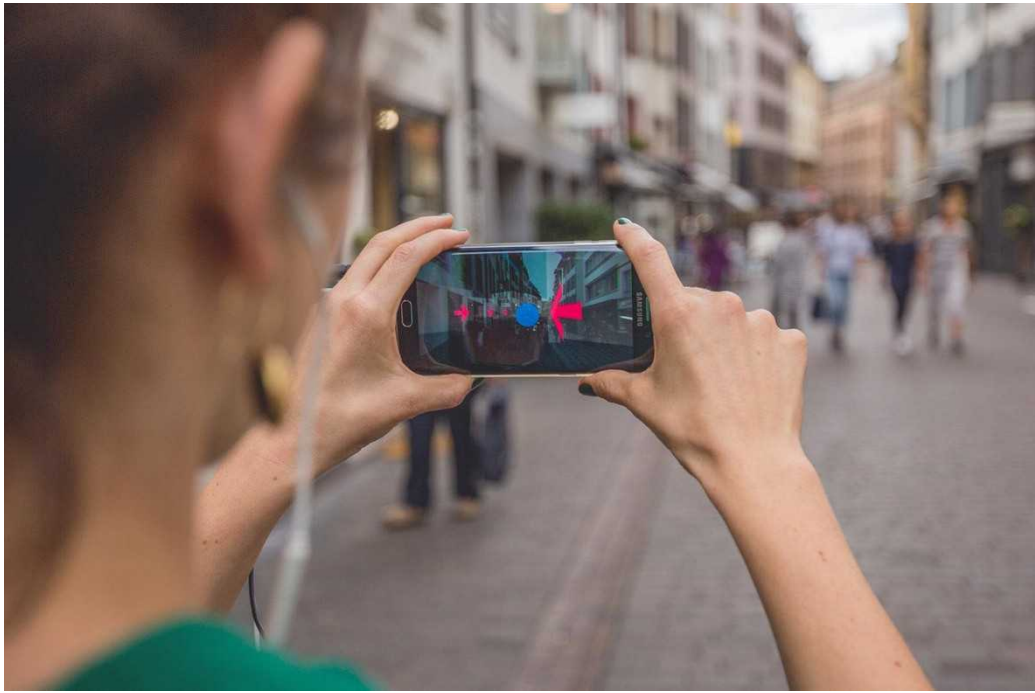
https://hturan.com/

Zach Liebermann, Audio in Space

AR Design Challenges

Accessbility

- Experience/App available in the store or on specific devices at a venue, or simply on the web
- does the experience require the user to move around / stand /perform any kind of physical (inter)action outside of screenspace
- audio/subtitles, language, speed of experience, different knowledge of handling AR / mobile phones
- who is the audience?

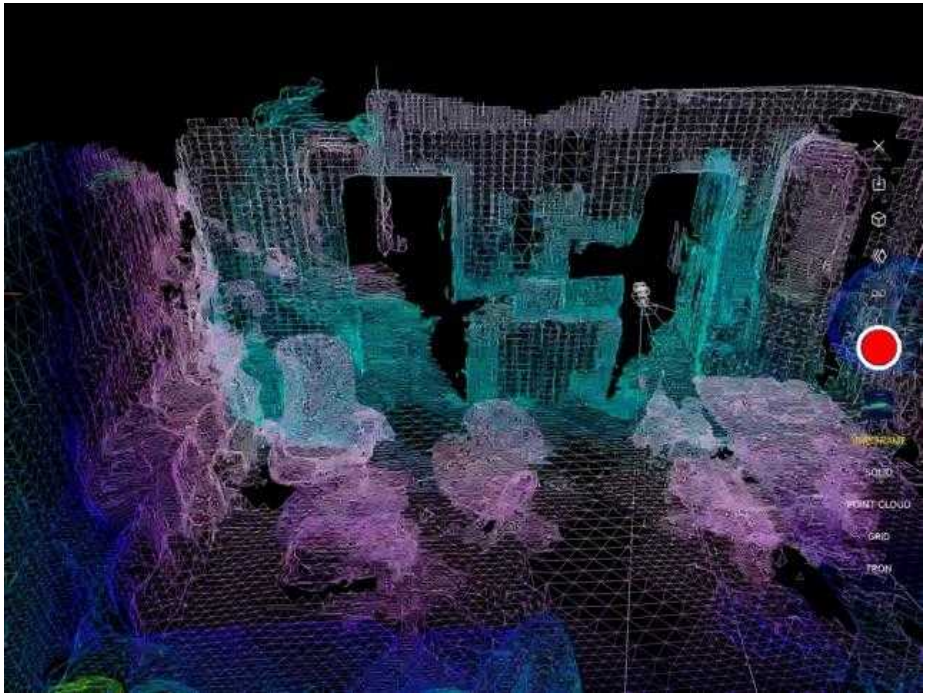


Future Is Now, 2017

AR Design Challenges

Hardware

- optimise the experience to run on limited hardware capacity / older models
- have different built versions for different generations of hardware
- what technical requirements does the AR experience have (LiDAR, SLAM, image tracking, GPS, sensors, processors, etc.)



Lidar Camera (App Store)

AR Design Challenges

Audience

- how to make the device part of the experience itself?
- Instructions
- Attention economy if the experience is on the users private device
- different levels of knowledge

Hier und Dort, 2018

Personal Projects

Personal Projects

What is the aim?

- Prototype a short VR/AR experience using your existing Unity knowledge + available assets
- have a least one interaction in your experience
- think about what story you want to tell / what statement you want to make
- include the audience in an interesting way

Time frame:

- one course afternoon, 2 course mornings + whatever time you want at home (max. 30 hours, including ideation, planning, programming, bugfixing, iterating)

Possiblities

Starting points for your Project

- choose a space
- introduce a shift between the physical and virtual space
- play with the notion of immediacy and hypermediacy
- include the viewer/player in a interesting way
- combine this with a topic you are interested in

Virtual Reality Possibilities

- narrative space (with scenery, audio, text) free to explore
- gallery / exhibition space
- immersive landscape
- play with unusual movements (climbing ladders, swimming, flying, etc.)
- playing with size of landscape (very tiny, very big)
- AR (with passthrough enabled) include the physical space
- what else?

Augmented Reality Possibilities

- virtual character to interact with
- narrative space to explore
- gallery space
- augment reality (live writing, place objects, etc)
- story in a physical space, guided through with AR
- what else?

Mini-Pitch

Sketch and Present your Idea

DATE
17.11.25

Mini-Pitch
visualise and present your idea and your planned next steps

Duration
6-8 min per group

after each group we will have a short Q&A to comment, associate and clarify