

Creative Technologies I - XR

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Extended Realities

Introduction and Overview

Schedule Semester

DAY 1 (07.11.)

- Introduction
- Examples
- Overview History Immersive Technologies
- Remediation, Immediacy, Hypermediacy (Bolter, Grusin)
- Unity Introduction

DAY 2 (10.11.)

- Video Game Spaces (Nitsche)
- Case Studies XR
- Design Challenges AR/VR
- Personal Projects (Find Group & Device)
- Unity Introduction

DAY 3 (17.11.)

- Mini-Pitches & Discussion
- Project Setup (AR/VR)
- Interaction Examples for AR / VR in Unity
- Work on Projects

DAY 4 (28.11.)

- requested topics, specific questions concerning technical and dramaturgical questions of your projects

DAY 5 (15.12.)

- Project work and final problem solving

Who is Who?

- Name
- Pronouns
- previous Studies
- with what cultural product did you last get in contact? (Theater, Film, Video Game, Exhibition, etc.)

Outline of Topics

Outline of Topics

COVERED in class:

- Concepts of “Remediation”, “Immediacy”, “Hypermediacy” (Bolter, Grusin) and Video Game Spaces (Nitsche) to look at contemporary media examples
- Brief History of XR and historical Examples
- Introduction to Unity Game Engine
- Design criteria/challenges when building VR/AR experiences using game engines
- Basic game engine programming
- Getting started with Quest VR headsets and Android AR Tablets

NOT explicitly covered in class:

- 360-degree film/animation
- TouchDesigner and other non-game engine realtime creation environments
- Hardware beyond Oculus Quest
- locationbased Augmented Reality
- More advanced game engine functions (e.g. physics programming, shaders, various advanced programming patterns, tools for optimisation etc.)

Personal Projects

Your Projects

AIM

- create a first prototype in AR/VR
- get to know Tools and Workflow for XR development in Unity
- find ways of acquiring specific knowledge for your ideas
- tell a story/simple thought

GUIDELINES

- a topic / question will be provided
- prototype will have to fulfill a minimum set of criteria (features, content, interaction, code)
- must be developed in the course + (max) 30 hours outside class

PROCESS

- IDEATION research and find a story you want to tell (Moodboard, articles, examples of inspirations)
- PITCH present idea in class, create a Storyboard / Wireframe
- 1st iteration PROTOTYPE: setting up workflow, add the necessary SDKs, have a test build on the target device
- 2nd and 3rd iteration PROTOTYPE: build out the experience, add content, test interaction, bug fixing

EVALUATION

DEADLINE 21.12.2025

to submit

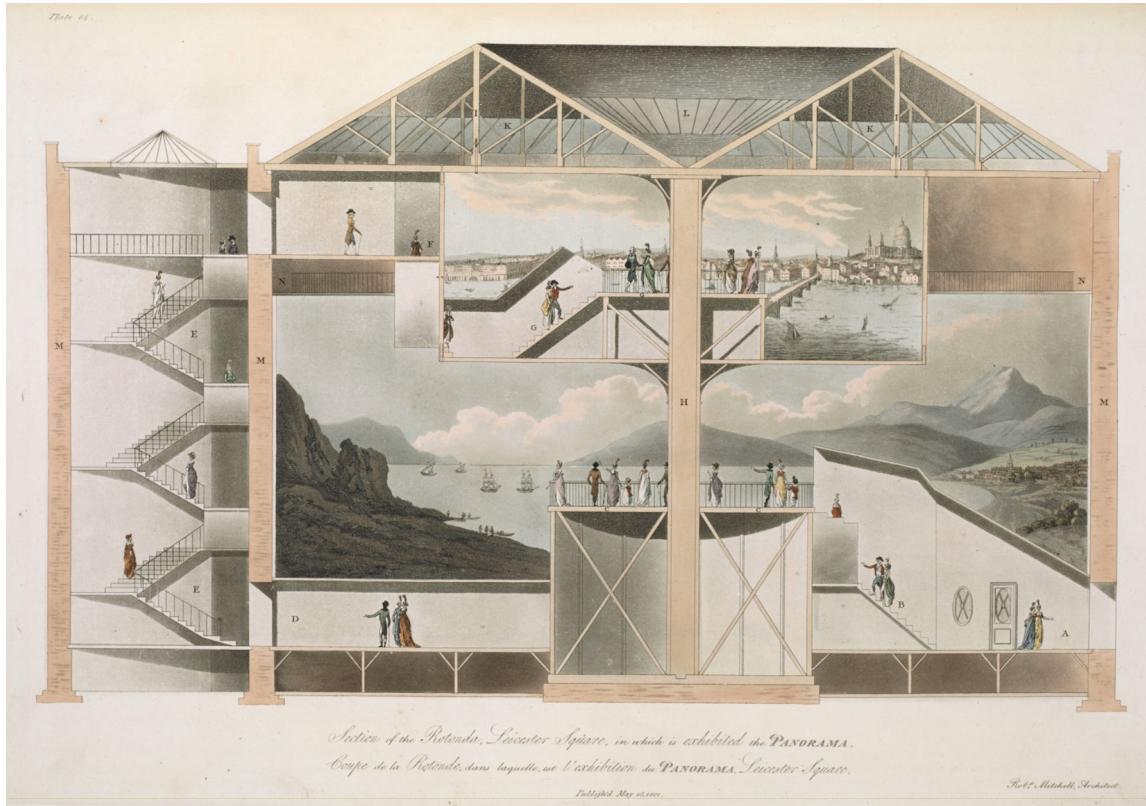
- Wireframe/Storyboard
- Screen Recording of Playthrough
- Screenshots
- Short Description
- Unity Project File (apk)

Evaluation on the basis of

- Realisation of the proposed concept
- originality of idea
- quality of implemented features
- playability
- overall conceptual and aesthetic interest

A Brief History of XR and Immersive Technologies

Panorama, Robert Barker (1737-1806)



in: Robert Mitchell, Plans, and views in perspective, with descriptions of buildings erected in England and Scotland; and an essay to elucidate the Grecian, Roman and Gothic Architecture, London, 1801.
Quelle: British Library

Sword of Damocles, Ivan Sutherland (1968)



- Head-Mounted Display
- Head Tracking

Sayre Glove, Daniel Sandin & Thomas DeFanti (1977)



- first data glove
- hand tracking

<https://www.evl.uic.edu/research/2162>

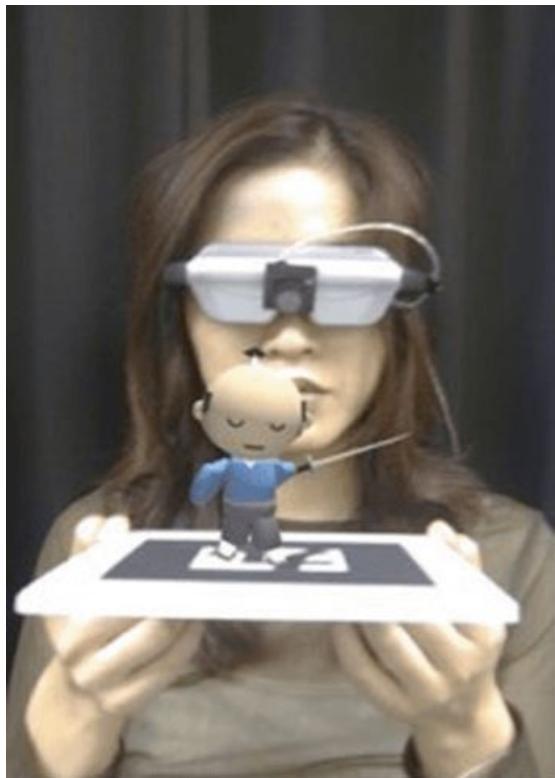
VPL Research, Jaron Lanier (1984)



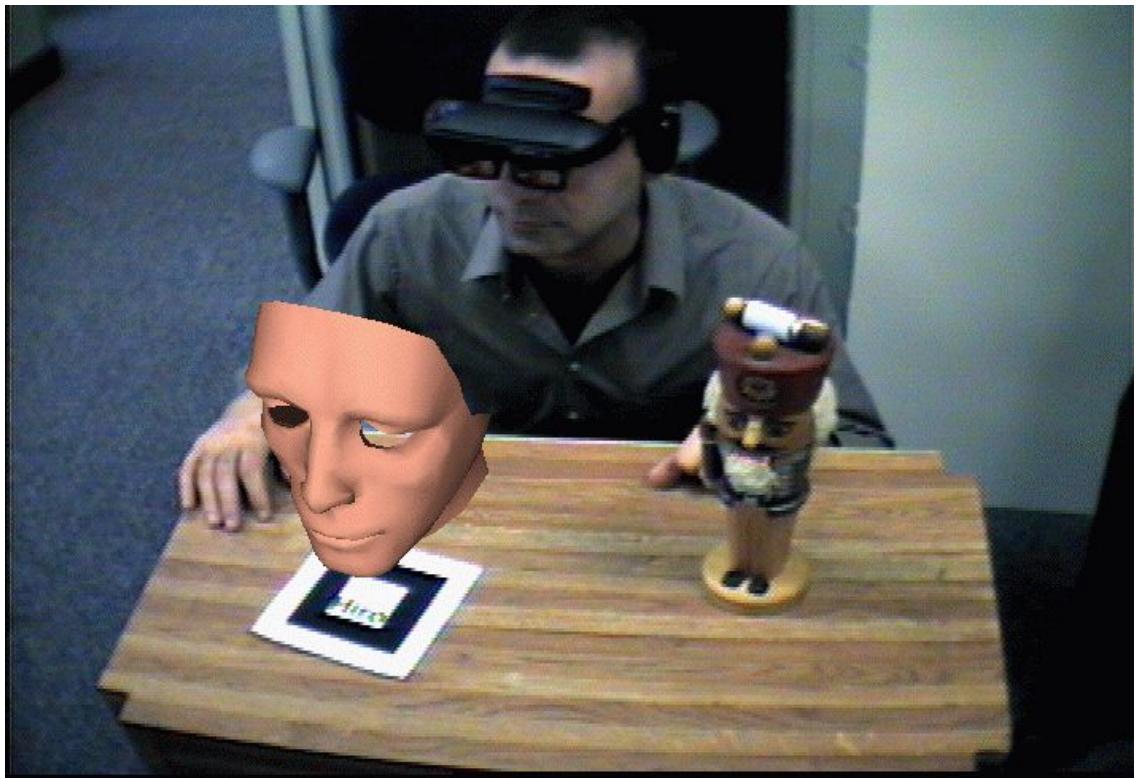
Cave - Automatic Virtual Environment (1992)



Augmented Reality and Mobile Interfaces (late 1990-2000)



Source: ebrary.net



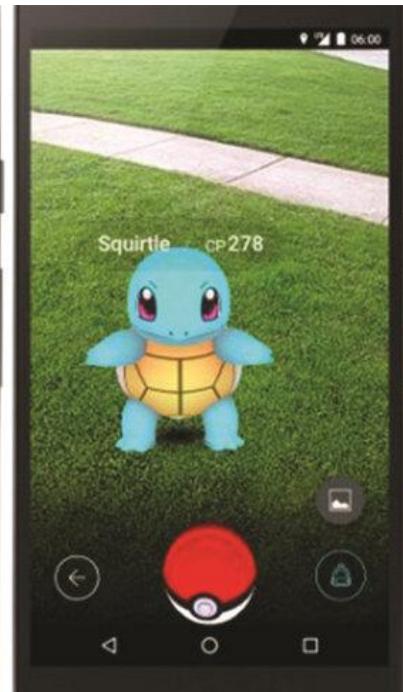
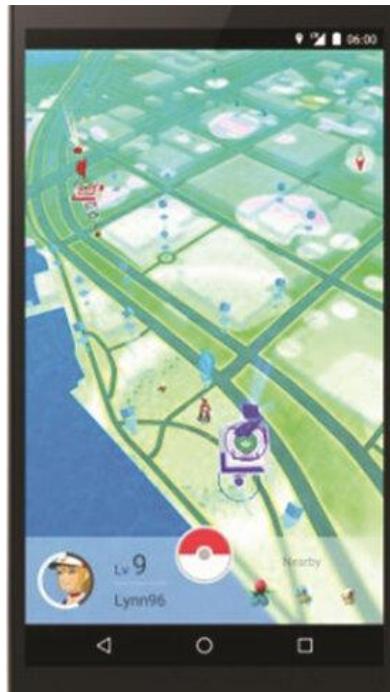
<https://www.cs.vu.nl/~eliens/manuals/art-pc211/ART-PC2.11.htm>

Oculus Rift (2012) / Microsoft Hololens (2016) / HTC Vive (2016)



- 2nd wave VR Headsets

Location Based Augmented Reality (from 2016)



https://www.researchgate.net/figure/User-interface-of-Pokemon-Go-Retrieved-from_fig1_317591289

Mixed Reality - Spatial Computing



meta Quest 3, Source: meta



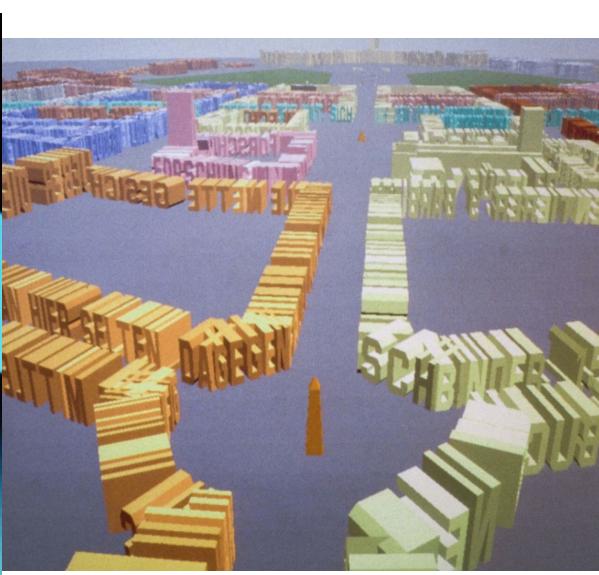
Apple Vision Pro, Source: Apple



Microsoft HoloLens Source: Microsoft

Examples of Extended Reality (AR/VR)

Jeffery Shaw: Legible City (1989, in Nagoya, Japan)

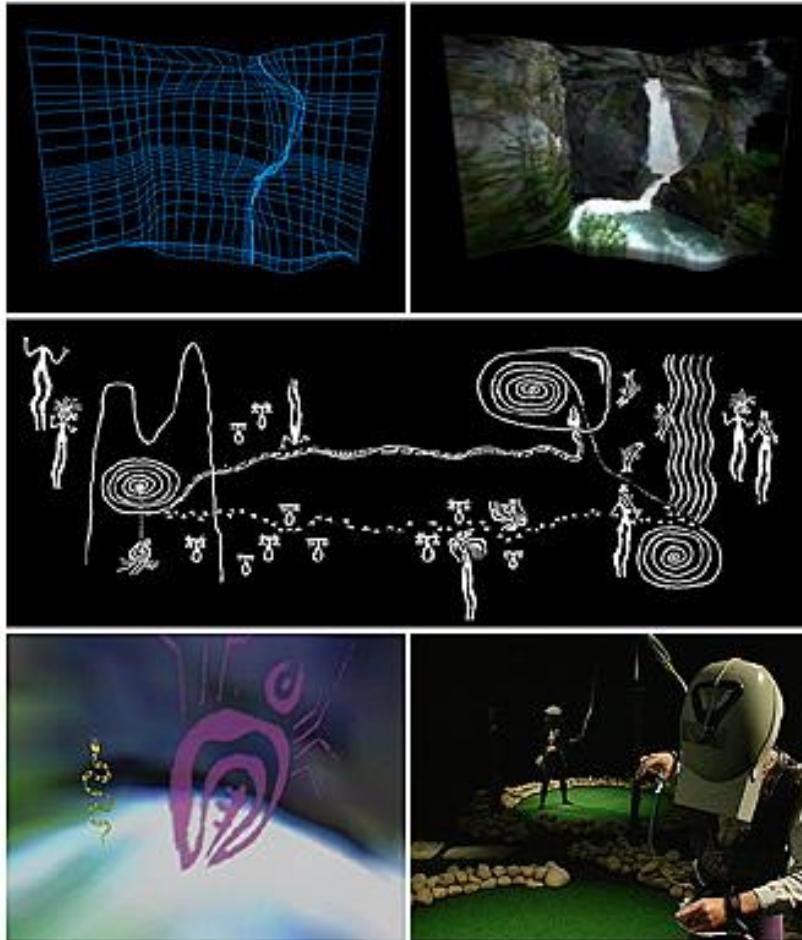


- hybrid art installation
- engagement of the viewer

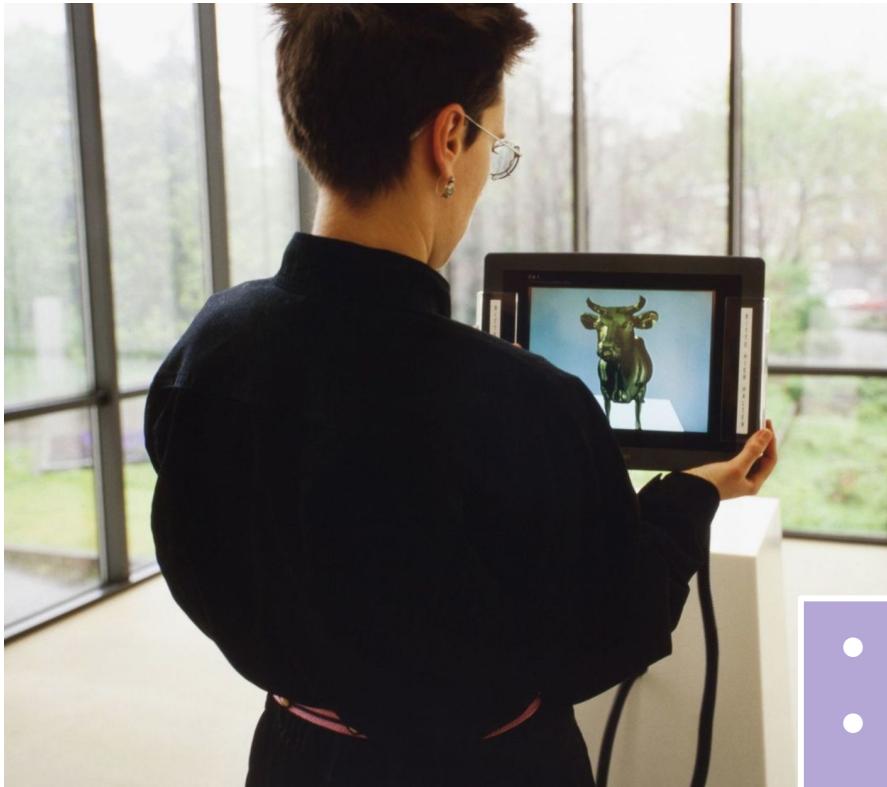
Brenda Laurel: Placeholder (1993)

Documentary Video:
<https://vimeo.com/27344103>

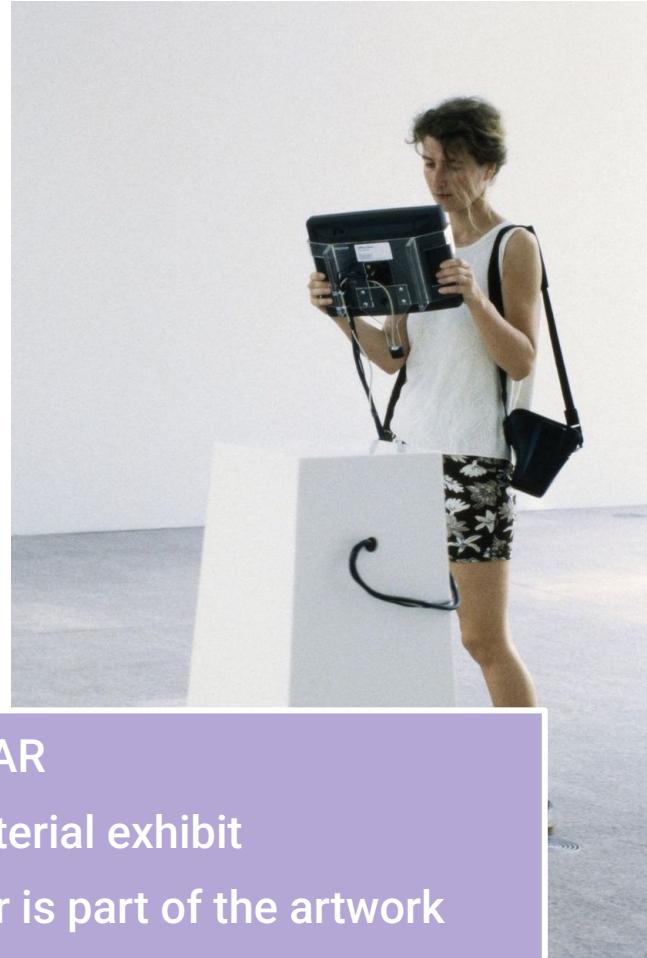
- hybrid VR installation
- 25k lines of code, 11 computers running simultaneously



Jeffery Shaw: Golden Calf (1994)



© <https://www.jeffreyshawcompendium.com/portfolio/golden-calf/>



- early AR
- immaterial exhibit
- viewer is part of the artwork

Julian Oliver: Artvertiser (2008)

oliver, 2008 / oliver, Castro, Stewart, 2010



A public service announcement by Julian Oliver

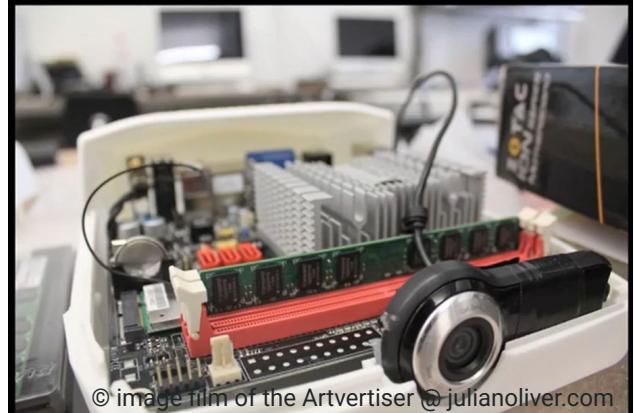
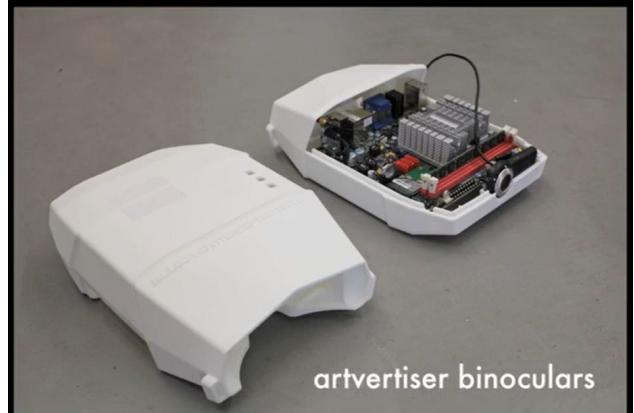
<https://theartvertiser.com/>



Julian Oliver: Artvertiser (2008)

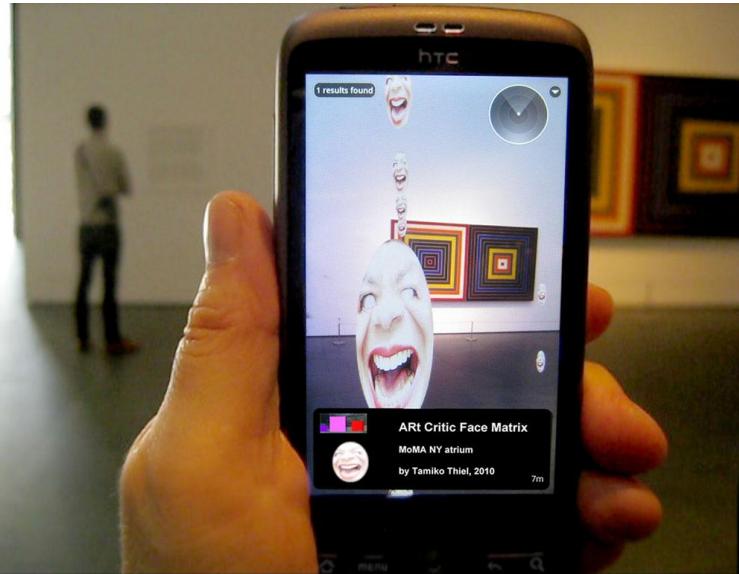


- 2008
- Custom made Hardware
- Image Trigger -> Mapping images on top
- Improved Reality



© image film of the Artvertiser @ julianoliver.com

Tamiko Thiel: We AR in Moma (2010)



at MoMa New York



at San Jose Museum of Art

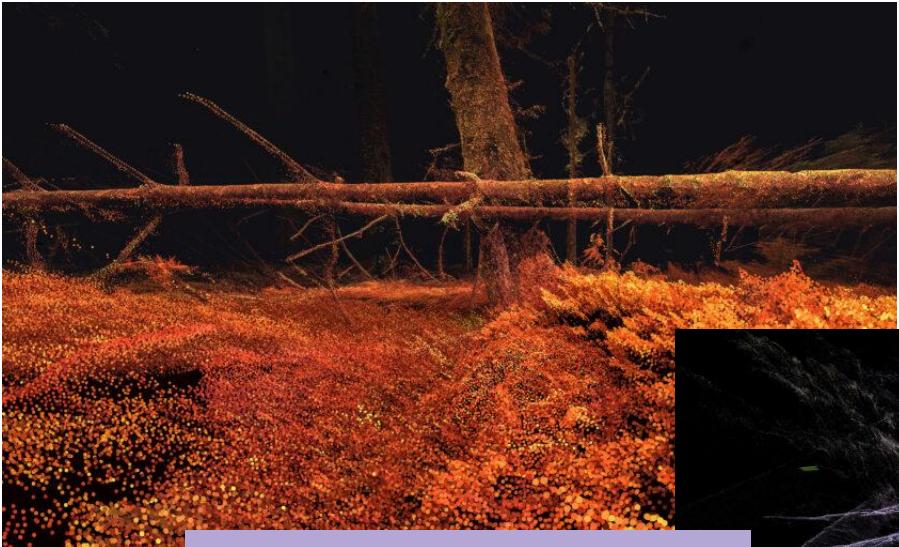
- Site-Specific AR
- digital/virtual Graffiti
- Art Hack / Art Invasion

Marjan Moghaddam: Art Hacks (since 2015)

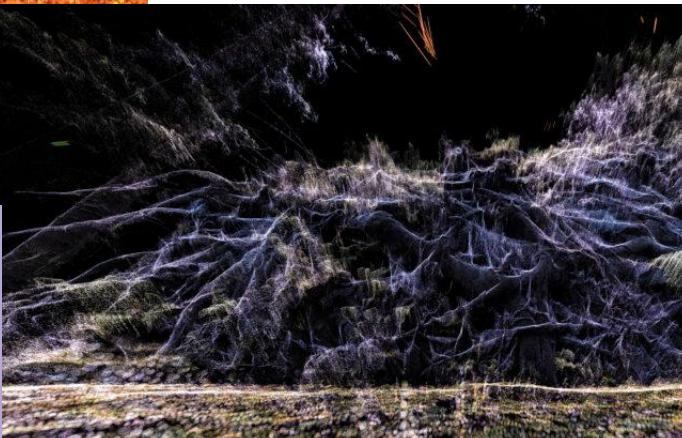


- Site-Specific AR
- digital/virtual Graffiti
- Art Hack / Art Invasion
- Art Activism (bypassing the curators)
- Visibility as artist in established venues (without being directly curated)

Marshmallow Laser Feast: The Eye of the Animals (2015)



- Virtual Reality Installation
- custom extended headsets
- site specific



<https://marshmallowlaserfeast.com/project/in-the-eyes-of-the-animal/>

Blast Theory: A machine to see with (2011)

- Bank robbery, instructed through calls on my own phone
- its a movie, in the minds of the participants (their eyes are the actual camera)
- which aspects of the city/the passengers are real, which are my imagination?



<https://www.blasttheory.co.uk/projects/a-machine-to-see-with/>

Immersive Journalism by Nonny de la Peña

Hunger in Los Angeles, 2012



Project Syria, 2014

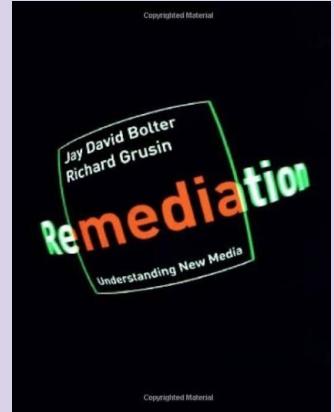


After Solitary, 2017



- immersive journalism
- recorded audio
- realistic reconstruction of places, scenes, people, real
- educative aspect (VR to generate empathy)

<https://www.youtube.com/watch?v=i50fwwQwwUg&t>



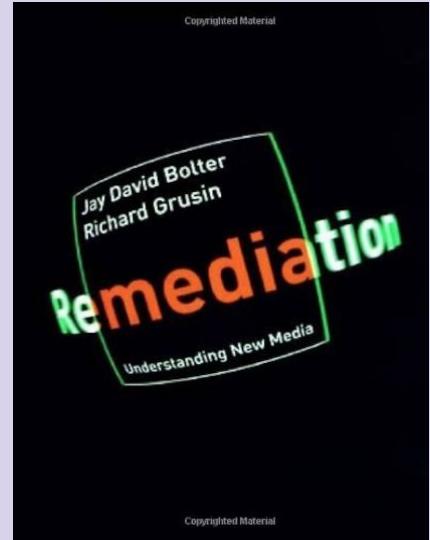
**Remediation: Understanding New Media,
Jay David Bolter & Richard Grusin, MIT Press,
1999.**

Remediation - Understanding New Media

- REMEDIATION: new media never exist isolated, but always “remediate” or interpret older forms of media anew.
- IMMEDIACY: tries to hide the medium, the interface, to make the medium invisible (e.g. Virtual Reality)
- HYPERMEDIACY: emphasises the medium itself. Significantly more fragmented experience of the content (e.g Website)

Immediacy

*in Remediation - Understanding new Media by
Jay Bolter and Richard Grusin*







©Leon Keer

Immediacy (Bolter / Grusin, 1999)

Immediacy is the desire to make the medium *disappear*, so that the viewer feels directly connected to the content or the world being represented.

- To achieve the illusion of “being there”
- The viewer forgets about the medium and experiences only the represented world.
- The technology/medium becomes invisible, producing a feeling of unmediated presence.



The Arrival of a Train 1896
The First Film Ever Made

Lumière Brothers: L'Arrivée d'un train en gare de La Ciotat (1896)

Examples of Immediacy in different media

Renaissance Painting: Central Perspective
-> Illusion of depth

Photography / Film: Realistic depiction,
continuous shot, continuity editing

Computer graphics & VR: Real-time
rendering, head-tracking, interactivity

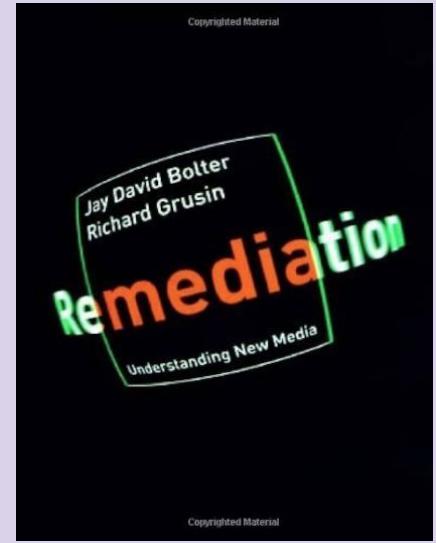
Augmented Reality / Mixed Reality: the
overlays blend with the physical world



Dirck van Delen 1633, Source:
<https://www.essentialvermeer.com/technique/perspective/history.html>

Hypermediacy

*in Remediation - Understanding new Media by
Jay Bolter and Richard Grusin*



Hypermediacy (Bolter / Grusin, 1999)

- does not attempt to erase the medium
- in hypermediacy the viewer “is repeatedly brought back into contact with the interface”
- In every manifestation, hypermediacy makes us aware of the medium or media and (in sometimes subtle and sometimes obvious ways) reminds us of our desire for immediacy

24 XR2 - 24 Histor CTech works * Rem... Datei Bearbeiten Ansicht H1

file:///C:/Users/sarah/MYSTUFF/Texte/Bolter_Jay_David_Grusin_Ri 44 (45 von 282) 120% □ T E

Remediation Bolter/Grusin

p22
In order to create a sense of presence as possible to our daily visual environment, we must make continuous and full of objects and events without rupture. But today's technologies frame rates, jagged graphics, brief pauses, and crashes.

p34
In every manifestation, hypermediacy is present and (in sometimes subtle and sometimes overt ways) it is a desire for immediacy.

Ze 4, Sp 304 584 Zeichen Unformate

a medium and to delight in that acknowledgment. She does so by multiplying spaces and media and by repeatedly redefining the visual and conceptual relationships among mediated spaces—relationships that may range from simple juxtaposition to complete absorption.

For digital artist David Rokeby, the dichotomy between transparency and opacity is precisely what distinguishes the attitude of engineers from that of artists in the new technologies. Rokeby (1995) is clearly adopting a modernist aesthetic when he writes that “while engineers strive to maintain the illusion of transparency in the design and refinement of media technologies, artists explore the meaning of the interface itself, using various transformations of the media as their palette” (133). In fact, since Matisse and Picasso, or perhaps since the impressionists, artists have been “exploring the interface.” However, Rokeby may not be doing justice to “modern” engineering. Media theorist Erkki Huhtamo (1995) points out that acknowledgment is characteristic of our culture’s attitude to digital technology in general: “Technology is gradually becoming a second nature, a territory both external and internalized, and an object of desire. There is no need to make it transparent any longer, simply because it is not felt to be in contradiction to the ‘authenticity’ of the experience” (171). And Huhtamo is right to insist that hypermediacy can also provide an “authentic” experience, at least for our current culture; otherwise, we could not account for the tremendous influence of, for example, rock music.

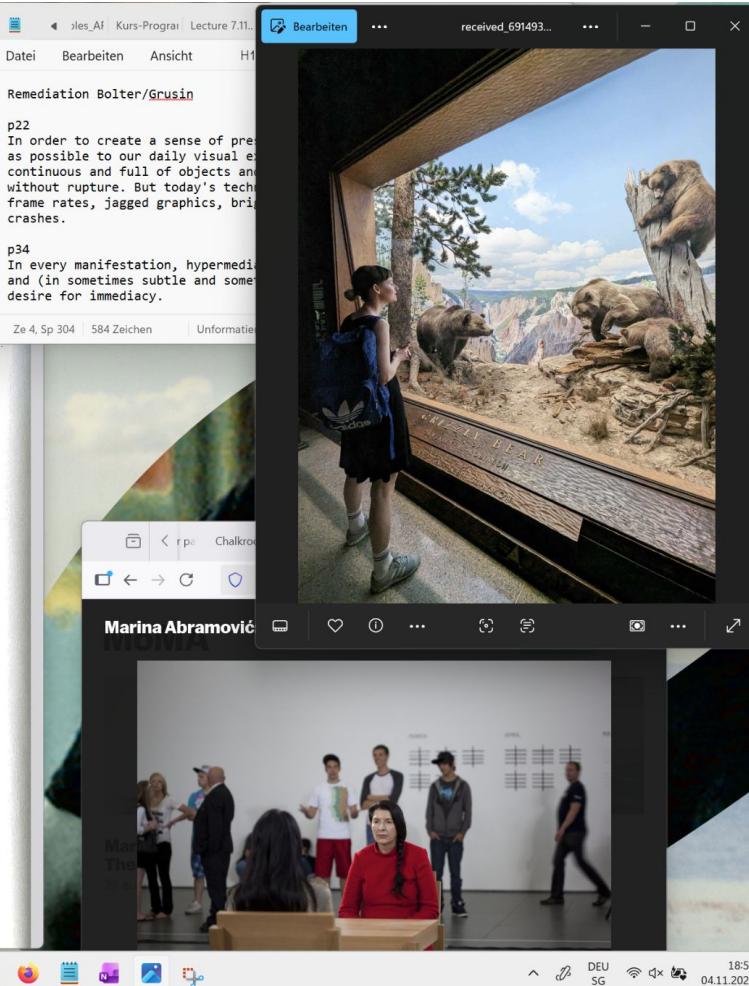
Above, we identified the logic of transparent immediacy in computer games such as *Mytr* and *Doom*, but other CD-ROMs operate according to our other logic and seem to revel in their nature as mediated artifacts. It should not be surprising that some of the clearest examples of digital hypermediacy (such as the Residents’ *Freak Show*, Peter Gabriel’s *Xplora 1*, and the Emergency Broadcast Network’s *Telecommunications Breakdown*) come directly or indirectly from the world of rock music production and presentation. Initially, when “liveness” was the signifying mark of the rock sound, early recordings adhered to the logic of transparency and aimed to sound “live.” As live performance became hypermediated, so did the recordings—as electric and then

Marina Abramović

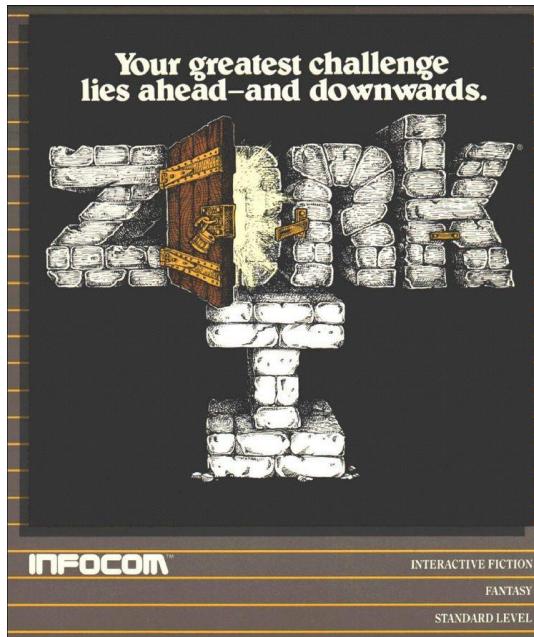
MOMA

Marina Abramović: The Artist Is Present

18:56 DEU SG 04.11.2025



Immediacy through...



Zork I: The Great Underground Empire

IBM PC, 64Kb RAM, Dual Floppy Drives, CGA, Color Display

Color Display
tic
>what lunch is it
That sentence isn't one I recognize.
>taste lunch
Thank you very much. It really hit the spot.
>look around
Kitchen
You are in the kitchen of the white house. A table seems to have been used recently for the preparation of food. A passage leads to the west and a dark staircase can be seen leading upward. A dark chimney leads down and to the east is a small window which is open.
Sitting on the kitchen table is:
A brown sack
>go to staircase
It's here!
>go up the staircase
You have moved into a dark place.
It is pitch black. You are likely to be eaten by a grue.
>
A: Zork I Load Save Durchsuchen... Keine Datei ausgewählt. Mount
256K Reset Ctrl-Alt-Del Keys

PC86 v2.23 © 2012-2025 Jeff Parsons

<https://www.pcjs.org/software/pcx86/game/infocom/zork1/>

Wikipedia, Zork1 by Infocom

Willing Suspension of Disbelief

Samuel Taylor Coleridge (1817)

Willingness of a recipient to temporarily accept the parameters of a fictional story in order to enjoy it, even if it is fantastical or impossible.



Source: The Suspension of Disbelief (and Why You Shouldn't Take Aliens to Plays)." Dip That Pen, Shake That Speare on Tumblr

Your Examples

Your Examples

- Immediacy
- Hypermediacy
- Willing Suspension of Disbelief
- Frame / Window

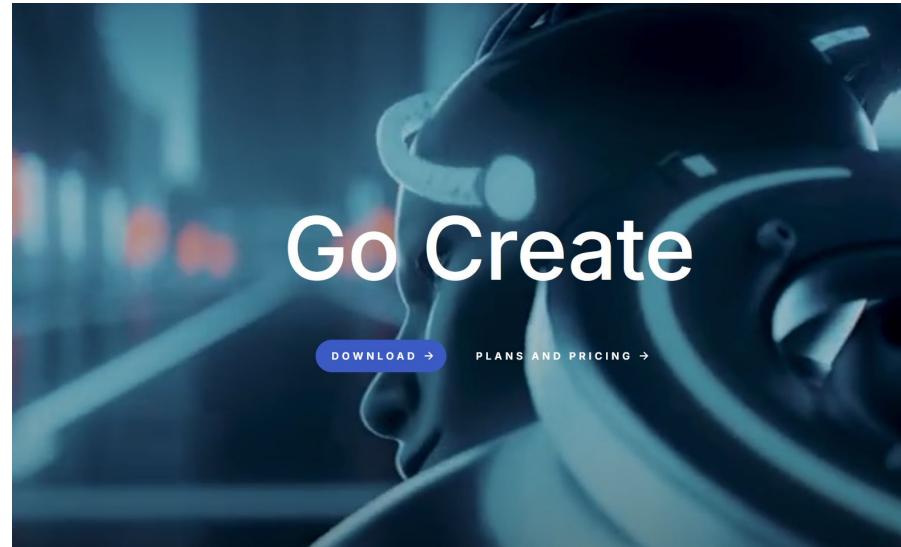
Game Engines

Games Engines: **UNITY**

launched in 2005 by Unity Technologies, as a “cross-platform game engine” to democratise game development

FEATURES

- C#
- 2D / 3D
- Good real-time rendering with URP (Universal Render Pipeline) and HDRP (High Definition Render Pipeline).
- modular Script components
- big community (indie devs, educators, XR, mobile devs, Documentation and Unity Asset Store)
- Strong XR ecosystem (AR Foundation, OpenXR, Meta SDK). Used widely in research, installations, training, and mobile VR.



- broad: PC, Mac, Linux, iOS, Android, WebGL, Consoles, XR devices, smart TVs, embedded systems.
- best for: lightweight, mobile, realtime interactions, AR/VR, people who code (or think in code)

Games Engines: **UNREAL**

launched in 1998, initially developed by Epic Games for the first person shooter Game Unreal (Sequel: Unreal Tournament) or Fortnite

FEATURES

- C++ and node-based visual coding
- 3D
- Powerful Graphics Engine State-of-the-art rendering (Lumen, Nanite, cinematic lighting). Default output looks more realistic with less tweaking.
- Powerful for high-end VR (photorealism, simulation), but heavier to deploy on standalone headsets.
- a lot of free, high quality assets (Unreal Marketplace)

The screenshot shows the official Unreal Engine website. At the top left is the Unreal Engine logo. Below it is a large headline in German: "Wir liefern die Engine. Du machst sie Unreal." A descriptive paragraph follows, explaining that the engine is provided for developers under fair conditions to bring their ideas to life. Two buttons are present: "Unreal Engine holen" (Get Unreal Engine) and "Informationen zur Lizenzierung" (Information about licensing). To the right is a large, atmospheric 3D rendering of a rocky, alien landscape under a dramatic sky, with the word "NEXUS" and "Aaron Sims Creative" visible in the bottom right corner of the image.

- optimised for PC, consoles and high-end hardware
- Strong AAA and film community (Epic, VFX, architecture, simulation).
- best for: high production value, photo-realistic graphics, film, renderings, people who think with nodes

Game Engines: OTHERS

- Godot Engine (open source)
- CryEngine -> used for Crysis and Star Citizen
- Source Engine -> Half-Life 2, Portal
- RPG Maker

