

Intro to Creative Coding + EVL

CS 427/DES 350 Creative Coding

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Creative Coding

In-person

Electronic Visualization Laboratory (EVL)

Engineering Research Facility (ERF)

842 W Taylor St

2068 Continuum

Zoom

<https://uic.zoom.us/j/87675623428?pwd=TWFmMDRhNTkzMmIDNIF6QUFWSjhGUT09>

Creative Coding

Introductions – Course goals and objectives

Class presentation

Unity Intro

Discussion

Class materials: syllabus, schedule, website, Box, Bb

Creative Coding

Course Website

https://www.evl.uic.edu/datsoupi/2023_CC/

Box – class materials, files, assignment submissions, videos, etc.

<https://uofi.box.com/s/9nmui3wxzadcernw8pxd968rx01mpcpc>

Blackboard - grades

Email – announcements, communication.

Creative Coding

Class Structure

Wednesdays 9-11.40AM and 1-3.40pm

Mixed lecture and lab, with an in-class focus on introducing programming and software concepts:

- Theory and practice
- Informative and thorough, rather than comprehensive
- Programming tutorials, collaborative exercises; planning & developing projects

Creative Coding

Class Structure

- students in GD, ID, CS – teams of 3
- Undergraduate and graduate students
- Work on individual assignments and class projects
- Collaboration between CS+GD+ID+IDEAS → Transdisciplinary Fertilization

Creative Coding

Goals:

- To become familiar with contemporary tools in VR and computational expression
- To work collaboratively to create conceptual creative coding projects at the intersections of design and technology

Creative Coding

Theory + practice

Project based / Exhibition organization

- projects will have a *research* (theoretical), *conceptual* and *technical* components
- projects should be novel and clearly illustrate a design and/or conceptual contribution
- each project needs to be documented in writing, video, images and code

Creative Coding

We are experiencing an outburst of the VR technologies across fields and industries. The increasing accessibility of headsets is attracting designers into VR to examine its potential beyond gaming.

However, despite this proliferation, there are conceptual, theoretical and practical challenges that require effective collaboration.

Participants will share reflections of the impact of advanced technologies on contemporary design theory and discuss how contemporary technologies can inspire novel forms of design practice.

Creative Coding

What is the future of design in the context of rapid advancement of technology?

What happens when VR technologies instead of being a choice for designer became a required medium?

Can we define theoretical, practical and empirical methods that can provide a better understanding of design communication possibilities in modern virtual-, augmented-, or mixed reality (XR) environments?

Creative Coding

Tools

Maya Autodesk (3D)

Unity 3D (Educational free)
version 2019.2.11

C#

Adobe CS

Audacity

Visual Studio

Collaboration Tools

Zoom

Box

Blackboard

Unity Gluon

Slack

Discord

Questions

- What might creative coding, VR, design, and theater have in common, conceptually and practically?
- How can the VR experience be designed in such a way that it raises our awareness of the hidden systems underlying both technologies and global environmental challenges and urges us toward critique and interrogation of them?
- How can creative coding adapt theater and design concepts and methodologies to create VR interactant experiences that are not only engaging but also edifying?

Class Methodologies

- experimental VR projects
- little or no prior experience in theatre
- teamwork in interdisciplinary teams of 3-4 (CS+ DES)
- working within the design constraint of typographic expressions
- steep eight-week learning curve (C# programming language)
(many design students new to coding; cs students new to design and art)
- CHI2024 Student Design Competition

Class Methodologies

- Intersections of the vocabularies, theories, and practices of theatre, performance, and creative coding.
- For example, we drew parallels between the audience and user experience.
- We explore about how theatre's prioritization of the construction and representation of action can structural strengthen the interactive experience in VR.
- We consider how the empathic and motivational relationship the character that many stage actors seek in the theatre might enable the design of VR experiences that are more effective and nuanced in the evoking empathy from the interactant in regard to the societal concerns that were the topics of this course.

Class Methodologies: CAVE2

- Exhibition in the CAVE2 – week 13
- IBM gallery
- Live streamed by IBM
<https://video.ibm.com/recorded/131648207>
- Design Museum of Chicago (in progress)

Creative Coding

Evaluation

Group project
individual assignments
attendance
collaboration (peer review)
your willingness and ability to
accept peers & faculty feedback

15 classes

11 work sessions

Attendance is mandatory

>2 absences – final grade reduction

late submissions will be penalized

15% penalty for the first day they are late,

and 10% for each day afterwards

Be prepared for a lot of hard work

Self – studies outside of the class

Research/design/code

Class time is limited-

In-depth course materials for review

Assignments, Discussions (30%)

Collaboration, Attendance, Participation (20%)

Projects (50%)

Creative Coding

Individual Assignments

A1 – VR presentation

A2 – contribution VR Proposal

Coding exercise

VR Collaboration

Team Assignments

A2 – project proposal

A3 – revisions

A4 - Scene

A5 –VRE

A6 – Interaction

A7 –Interaction

A8 –Final Interaction

A9 –Audio

Improv

A10 – Test 1

A11 – Test 2

Projects

VR Project Exhibit

Final

VR Project Video

VR Project Images

VR Project Paper

Readings

Understanding Virtual Reality: Interface, Application, and Design, 2nd Edition by William Sherman and Alan Craig

Typographie by Emil Ruder, Arthur Niggli/Teufen

The Elements of Typographic Style by Robert Bringhurst, Hartley & Marks Publishers

The VR Book - Human-Centered Design for Virtual Reality by Jason Jerald (2015)
ACM Transactions on Graphics (Proceedings of SIGGRAPH), 2022 and earlier. (Available from ACM through UIC digital library)

Leonardo, 2022 and earlier (Available from MIT Press through UIC digital library)

Proceedings of the International Symposium on Electronic Art, 2022 and earlier (Available online)

Selected readings from The New Media Reader, edited by Noah Wardrip-Fruin and Nick Montfort, MIT Press 2003.

Peripheral Vision: Bell Labs, the S-C 4020, and the Origins of Computer Art, Zabet Patterson, MIT press, 2015.

Unity Game Development Essentials Kindle Edition by Will Goldstone.

Unity 3D Game Development by Example Beginner's Guide by Ryan Henson Creighton

EVL / Brief History

<https://www.youtube.com/watch?v=2aLOAjTISEs&t=6s>

Electronic Visualization Laboratory (EVL) – short history

- 1969 Dan Sandin is invited to UIC's Art Dept. to bring computers to the art curriculum
- 1973 Tom DeFanti comes to UIC with the GRASS system, EVL begins as a short order media house for education and research



Electronic Visualization Laboratory (EVL) – short history

40+ years of Art/Science collaboration at UIC

Joint program: CS and Art & Design departments

First program in the US offering MFA that is a formal collaboration of art and computer science 1973-2014

EVL – The Collaboration

- Artists organize projects, help visualize data, create media
- Artists are supported and get the toys to do their own work: often inspired by science
- Scientists get to communicate effectively
- EVL makes them look good
- EVL delivers visualization technology and techniques to science

Electronic Visualization Laboratory (EVL)

- Advanced networking research
- Distributed computing/visualization
- Collaborative software
- Advancement of tools and techniques for collaborative work over high-speed, experimental networks
- Development of viable, scalable, deployable stereo displays
- Development of VR hardware, software, tools and techniques

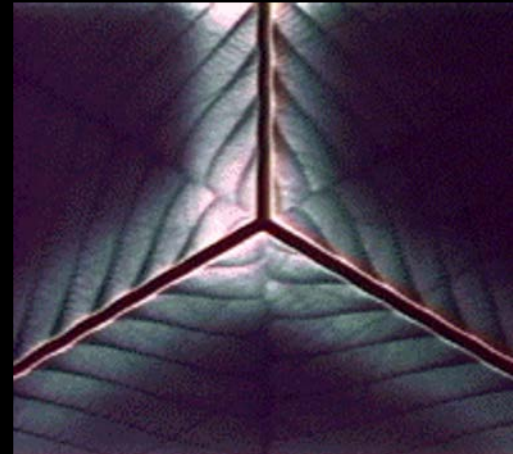
Electronic Visualization Laboratory (EVL)

mid-70s - the Electronic Visualization Events

a series of live performances in which images were computer generated and color processed in real time with musical accompaniment

EVL helped to produce the CG special effects for the first Star Wars film

<https://www.youtube.com/watch?v=2aLOAjTISEs>



CAVE® 1992



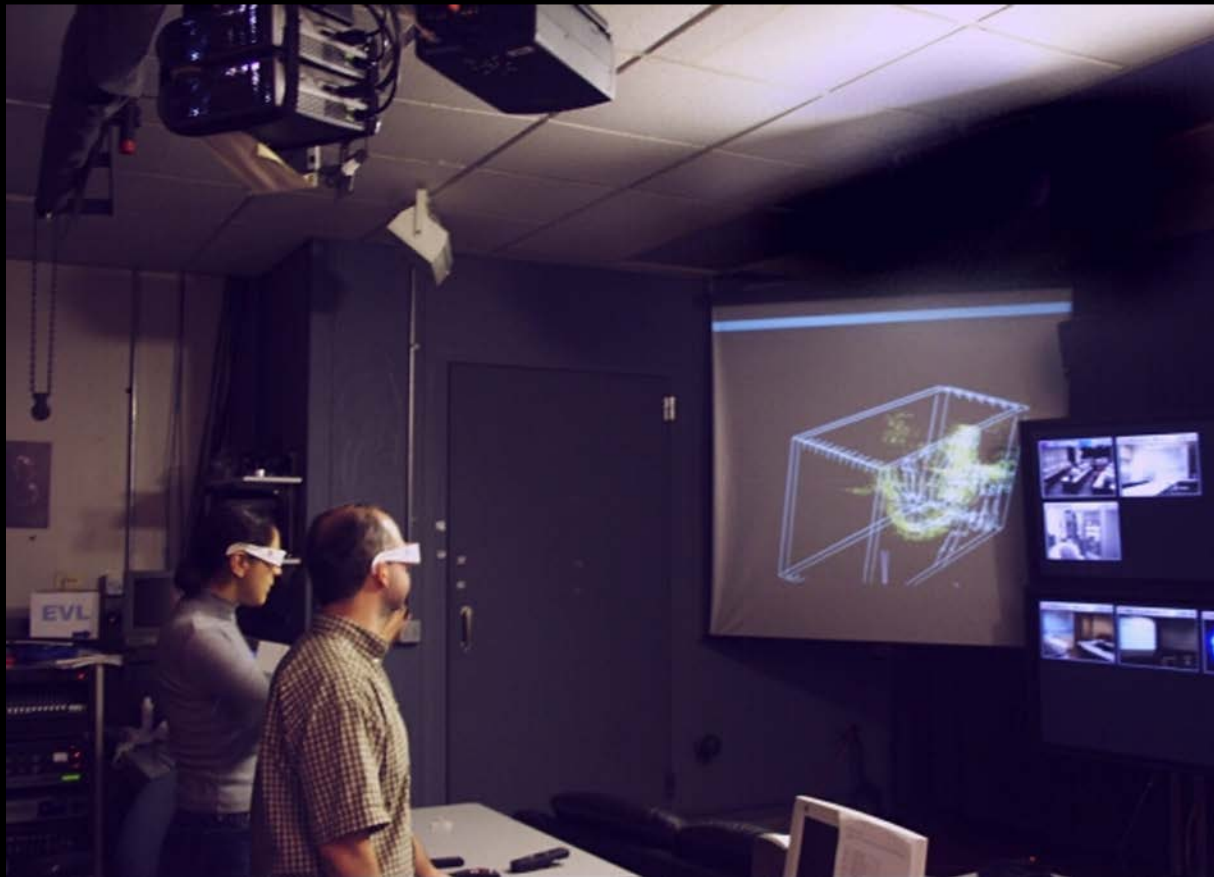
ImmersaDesk® 1995



Paris 1998



GeoWall - 2000



Varrier



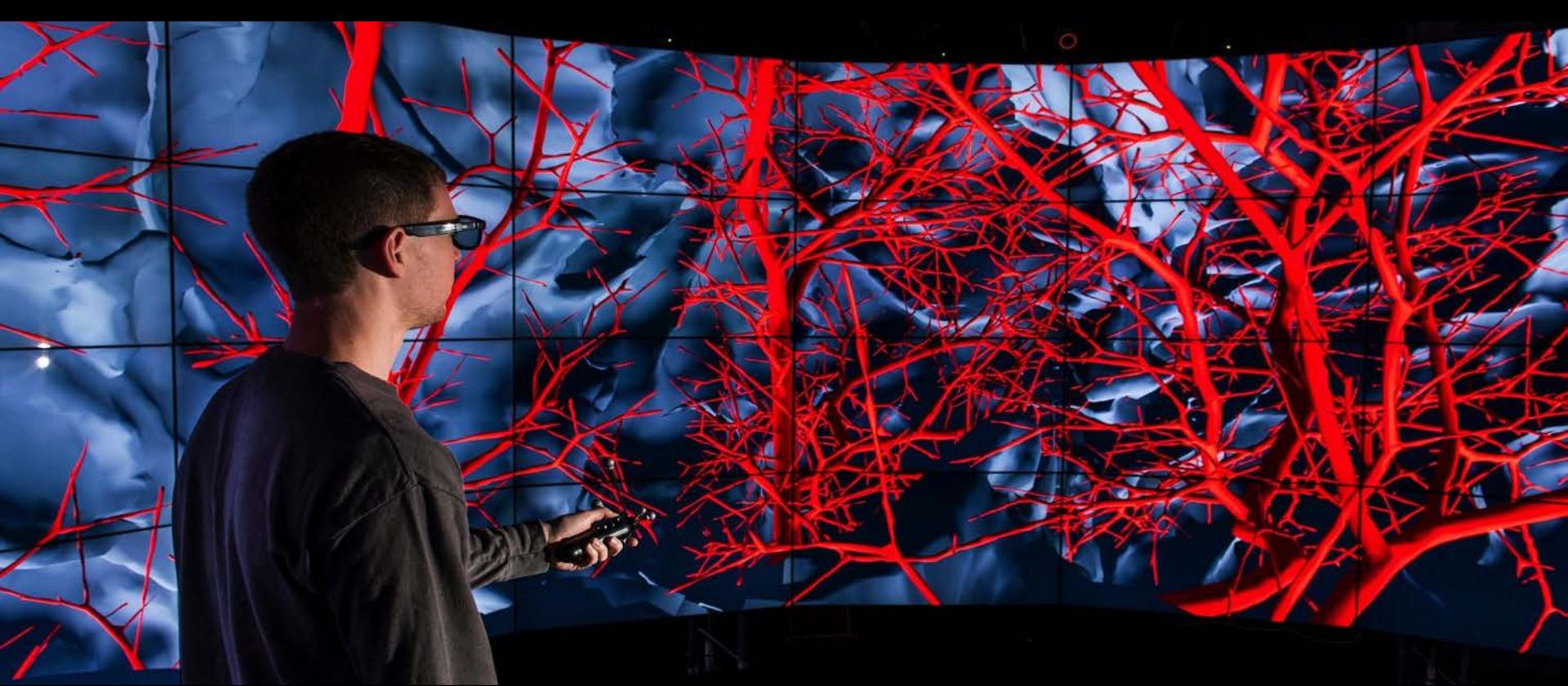
CAVE2 -2012



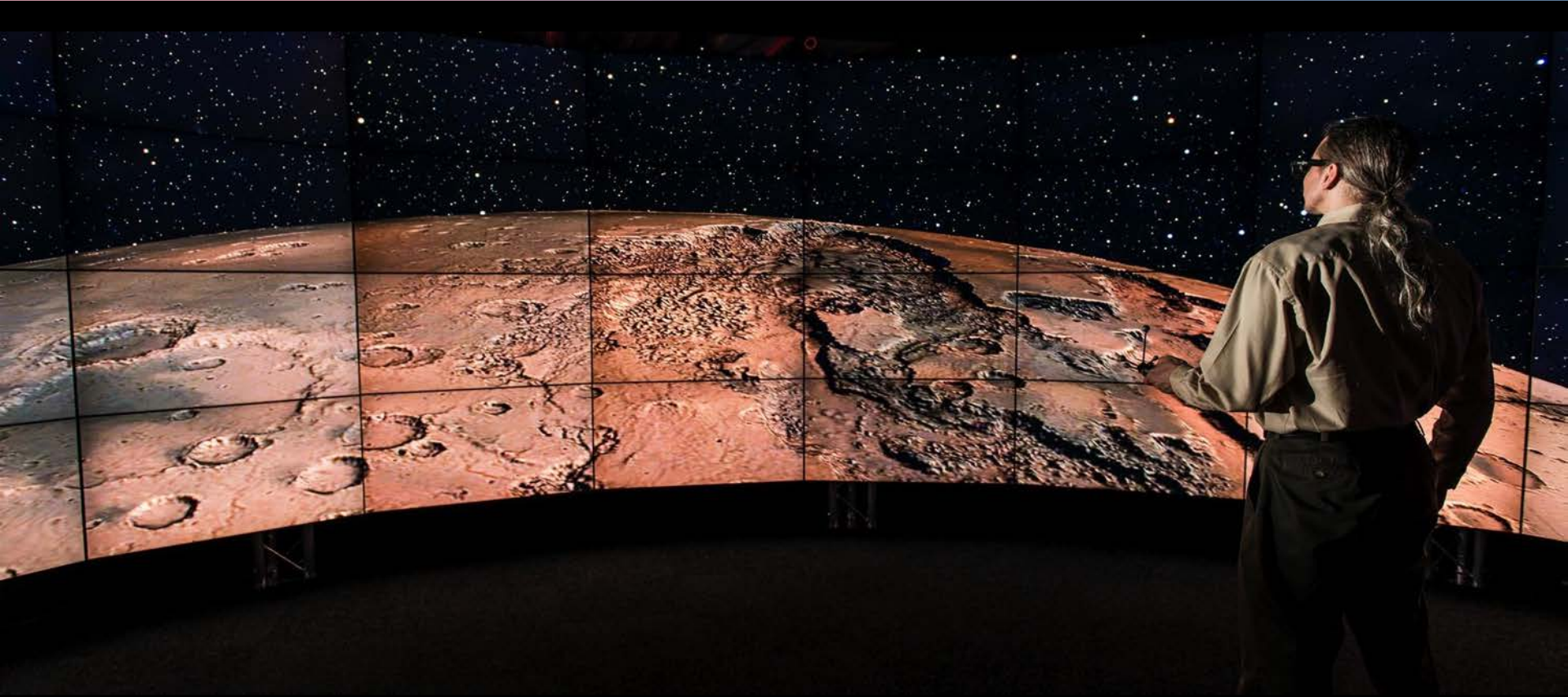
Particle Dreams in Spherical Harmonics



3D Brain MRI Data



Mars Surface



Class Projects 2023-2021

VR STUDENT PROJECTS - BARRIERS

by John Lee, Agustin Tena, Abril Azpeitia

Migrants take up 3.5% of the world's population, according to the United Nations.

Using Tagalog and English, "Barriers" simulates the way a migrant faces the challenge of being in a new place without knowing the language.

https://www.evl.uic.edu/datsoupi/2023_CC/images/2021Fall/barriers.mp4



VR STUDENT PROJECTS - SURVIVE

by Christine Chen, Anais Roman, Angelica Smiech

- Homelessness has always been an issue in society and educating people with why it still exists is relevant to how we can lessen it by spreading awareness.
- This virtual reality experience will help give participants a better understanding of homelessness within their own city of Chicago.

https://www.evl.uic.edu/datsoupi/2023_CC/images/2021Fall/survive.mp4



VR STUDENT PROJECTS - TRAJECTORY

by Humza Habibullah, Sebastian Lopez, Emily Carroso

Diversity in the workplace has been a slow process in rectifying many areas, from recruiting, to hiring, to promoting individuals of color. Many studies suggest that diverse organizations are 1.7x more innovative than their lesser diverse counterparts. TRAJECTORY intends to educate the user about the importance of diversity within a workplace and its positive impact on society.

https://www.evl.uic.edu/datsoupi/2023_CC/images/2022spring/trajec-tory.mp4

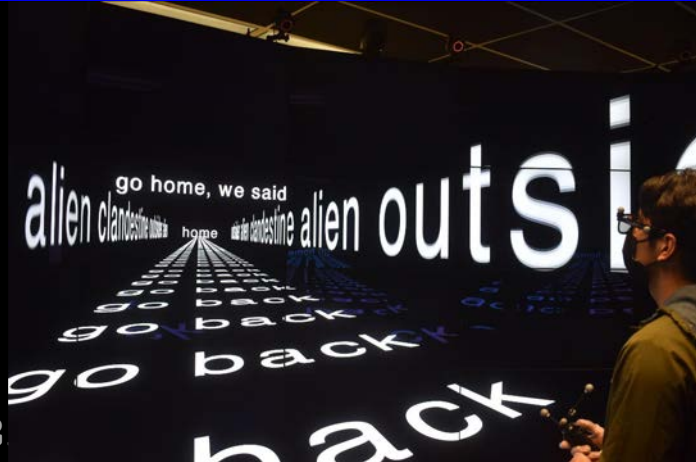


VR STUDENT PROJECTS - PATH

by Sabrina Zhang and Christian Palacios

Xenophobic rhetoric is intimately tied to nearly all avenues of social and political discourse surrounding immigration. Whether immigrants are first or fifth generation, dehumanizing labels projected onto them supersede their self-identities and contribute to both systematic and individually perpetuated violence. Path seeks to make tangible the serious power of invisible language.

https://www.evl.uic.edu/datsoupi/2023_CC/images/2022spring/Path.mp4



VR STUDENT PROJECTS - COST OF GREED

by Omar Butt, Edison Larco, Geo Aguilar

The human intrusion needs have altered the natural environment and arouses problems such as pollution, climate change and global warming. One of, if not, the biggest culprit of global warming is corporate power and greed centered on immediate profits and little regard for the impacts business decisions have on the environment. The *Cost of Greed* immerses the participants in two different scenarios that depict a world affected directly by the player's decisions and what could have been done differently to alter the outcome.

https://www.evl.uic.edu/datsoupi/2023_CC/images/2021Fall/barriers.mp4

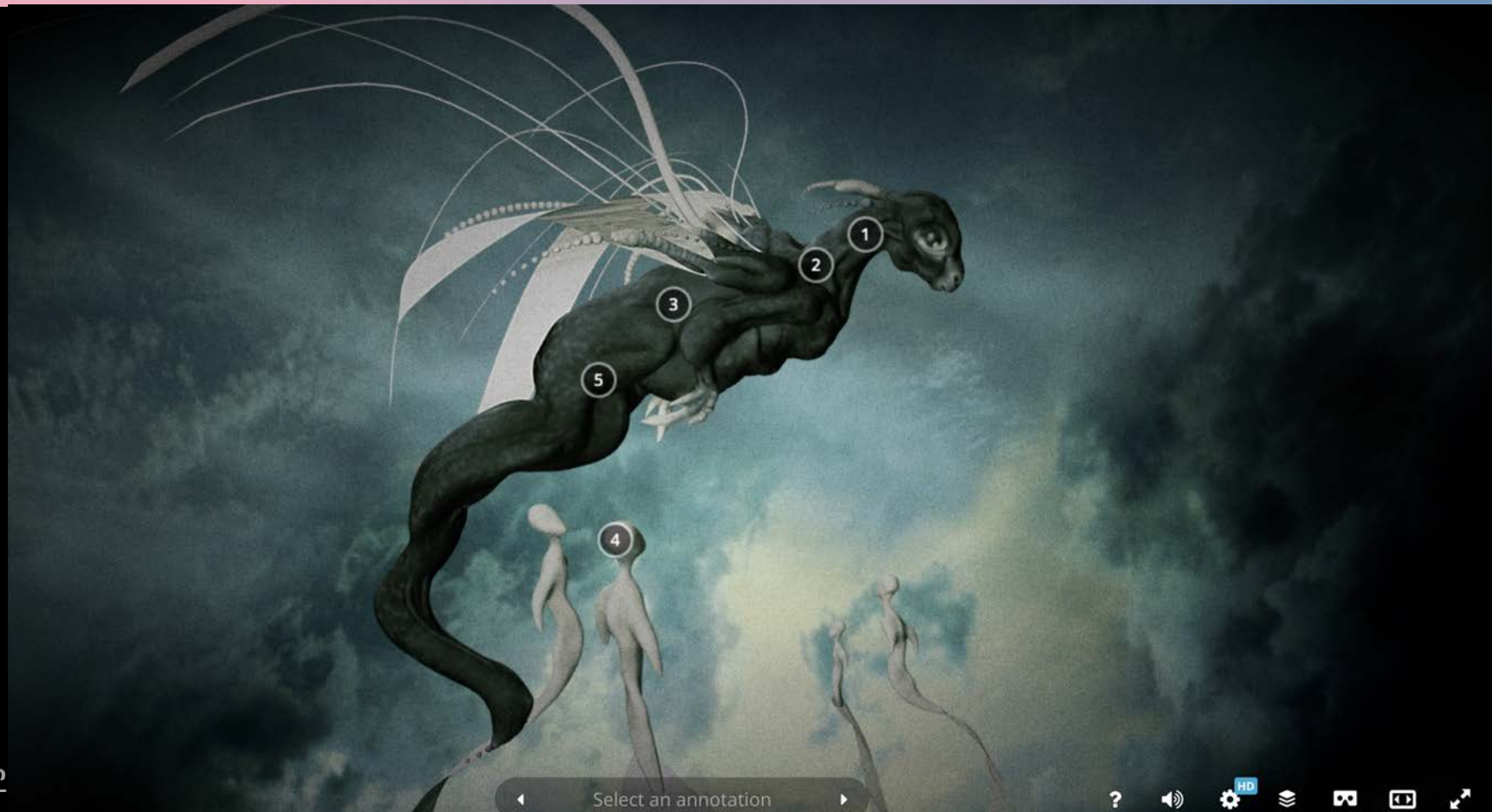


VR Art Inspirations

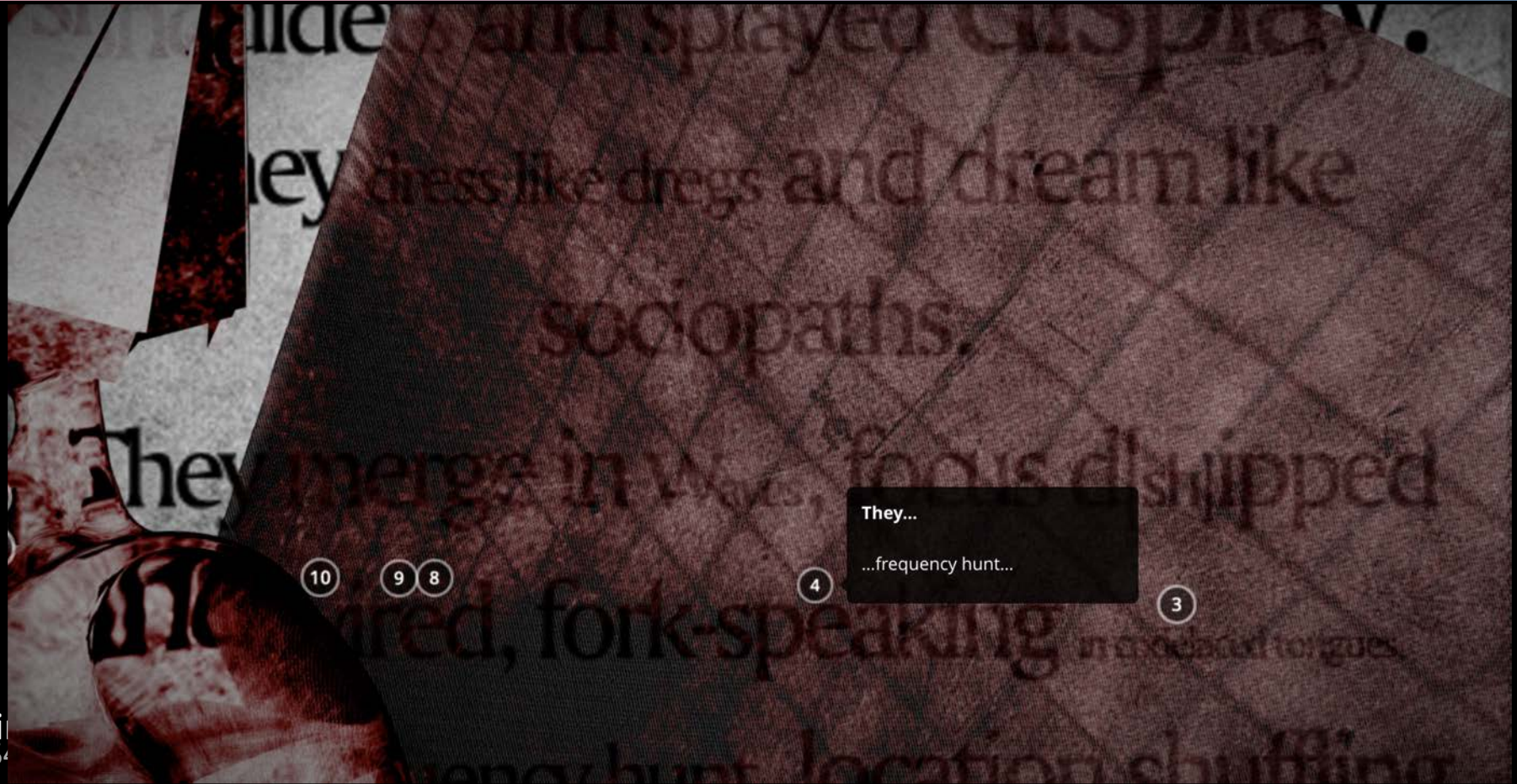
Refic Anadol – WDCH Dreams



Mez Breeze. In the Skin of the Gloam



Wracking in the Upper Bubble



BabaYaga by Baobab



Bodyless VR experience by Hsin-Chien Huang



失身記
Bodyless

“

The role of artworks is no longer to form imaginary and utopian realities, but **to actually be ways of living** ...

Nicolas Bourriaud *Relational Aesthetics* 2002

Class Projects

VR Project

IBM led Design+Theater+Creative Coding

Typography-based project

Typography - the art of arranging letters and text as compositional elements in print and digital publications.

form, style, legibility, and readability of written language

Assignment – A1

VR art / design presentation

Chose VR pioneer – sign up in our Google drive

Bb > Class announcements / Email

Research – major contributions, history, art, videos, images

- A biography or profile of the pioneer, background information, etc.
- A detailed description of the major contribution/s, and/or style research they created.
- A video documentation of at least 3 famous works of created by that VR pioneer.

Prepare a short presentation (3 minutes – top 3 projects (not any projects, but top projects) with video links– a summary of your research to present in class. Submit your slides in PDF format to class drive A1. Use books, information, and images found on the web to complete the research assignment. Make sure the information you curate is from credible sources.