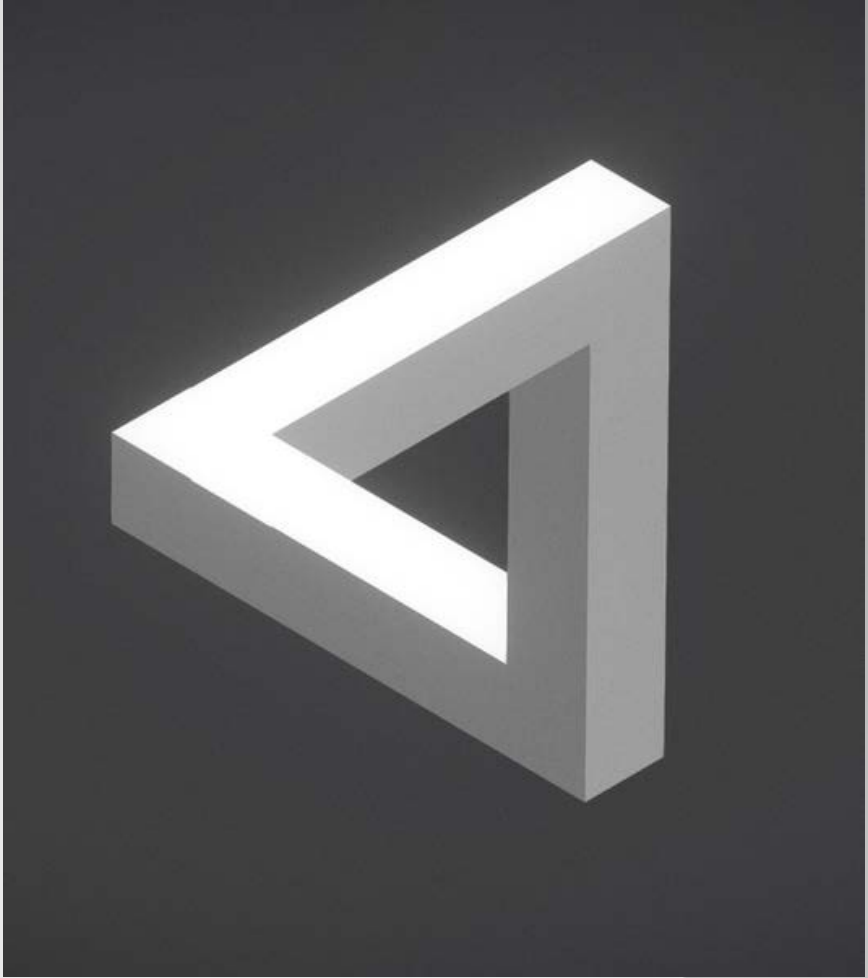




Impossible Space

curated by: Ellish Ye, Jingyan Lu

Curatorial Statement

The term “impossible” usually refers to spatial forms that look consistent in an image but cannot exist as solid objects in ordinary three-dimensional Euclidean space. A well-known example is the impossible triangle, which appears continuous but cannot be built in real geometric form. While the physical world is bound by stable spatial rules, virtual environments can break these limits. By using ideas such as optical illusions, forced perspective, depth perception, and Gestalt psychology, games can create fresh and memorable experiences that help players see and understand space in new ways.

The exhibition is built around six spatial principles—align, project, link, scale, switch, and unfold—each showing a different way games construct “impossible space” by bending perception, geometry, and movement.

1. Align: The Perfect Viewpoint

This mechanic asks you to find that one precise angle where disconnected fragments snap together to form a continuous path. In *Echochrome*, you rotate a minimalist black-and-white world to align holes on different planes, forming a walkable path for a silhouette character. *Monument Valley* asks you to manipulate impossible architecture, twisting towers and bridges until separate staircases visually merge into one continuous route. The experimental title *Perspective* challenges you to control both a character and a first-person camera view, aligning 2D platformer layouts with the 3D world to progress.

2. Project: From Shadow to Substance

Here, dimensions are fluid. You manipulate light and perspective to materialize forms or entire spaces from flat surfaces. In *Shadowmatic*, you rotate abstract objects in a beam of light until their shadow on the wall matches a recognizable silhouette. *Viewfinder* lets you use instant-photo snapshots as building blocks; hold a picture up to the world, and its 2D scene expands into a tangible 3D space you can enter.

3. Link: The Instant Gateway

Forget about walking and create your own doors. This mechanic shatters linear space by creating instantaneous connections between distant points. *Portal 2* defines the form: two portals on distant surfaces become a direct doorway for players and objects alike.

4. Scale: A Matter of Perspective

Size is not fixed but depends on your point of view. This mechanic plays with recursive worlds and perceptual tricks. In *Superliminal*, you can pick up an object that appears large in your field of view; when you place it down, it retains that gigantic scale, turning a small chess piece into a towering block. *Maquette* constructs a recursive puzzle where a detailed central diorama is a scaled-down replica of the larger world surrounding it; changes you make in one are mirrored proportionally in the other.

5. Switch: Between Two Realities

This mechanic presents parallel realities. In *Dishonored 2*'s "A Crack in the Slab" mission, you wield a device that lets you peer into the past version of a mansion, solving puzzles by altering the past to change the present. *Titanfall 2*'s "Effect and Cause" flips instantly between two states of the same facility—intact and ruined—to navigate hazards.

Split Fiction uses two stylistically distinct spaces presented on a split screen. You can cross the visual divide and slip into the other world to overcome obstacles.

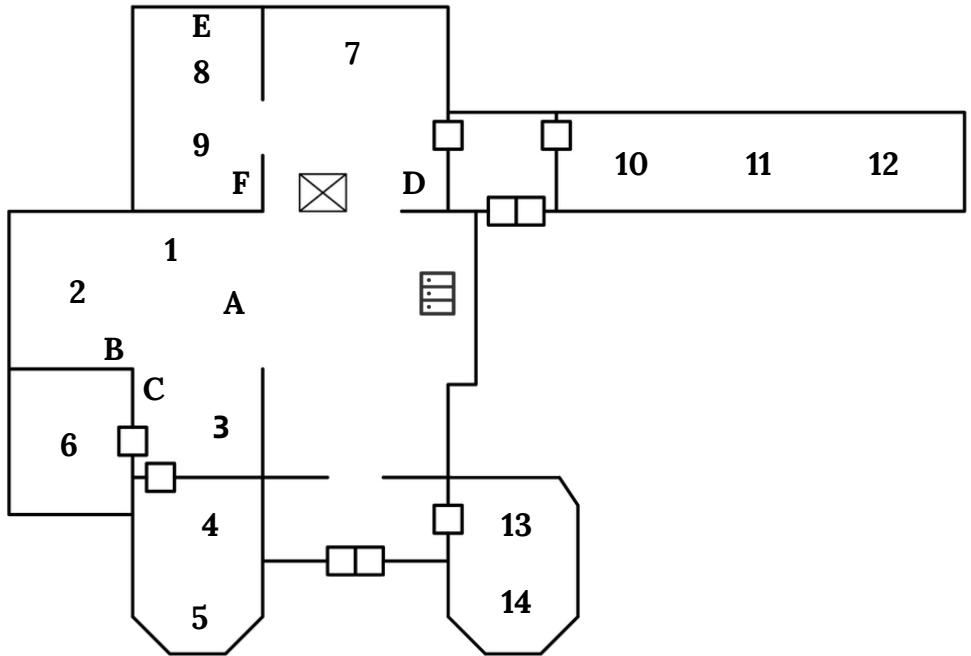
6. Unfold: The Moving Architecture

Witness static environments come alive as dynamic puzzle boxes. This mechanic transforms architecture into performative machinery. *Dishonored 2*'s Clockwork Mansion reshapes itself—walls slide, rooms rise, corridors unfold. *Control*'s Ashtray Maze rearranges to music, turning hallway traversal into a kinetic set-piece.

The exhibition presents game overviews and video montages, while selected titles include playable segments and mechanic diagrams. In addition, the exhibition showcases artworks, an architectural model, and other related materials. Several games also feature physical interactive installations, enabling you to directly engage with their spatial principles and better understand how games construct “impossible spaces.”

In the “dig deeper” section, we provide a list of videos, blogs, articles, books, and films from multiple perspectives. These materials not only analyze spatial mechanics in games, but also further explain how humans perceive and interpret space from architectural and psychological perspectives.

Floor plan



1 - Echochrome

2 - Monument Valley

3 - Perspective

4 - Viewfinder

5 - Shadowmatic

6 - Moncage

7 - Portal 2

8 - Superliminal

9 - Maquette

10 - Dishonored 2 (A Crack In The Slab)

11 - Titanfall2 (Cause and Effect)

12 - Split Fiction (Split)

13 - Dishonored 2 (Clockwork Mansion)

14 - Control (Ashtray Maze)

A - Impossible Triangle Monument, 1999 [Installation]

B - Ascending and Descending, 1960 [Painting]

C - The Ambassadors, 1533 [Painting]

D - Doctor Strange, 2016 [Flim clip]

E - Ames room, 1940 [Video]

F - The Twilight Zone, Small Town, 2020 [TV clip]

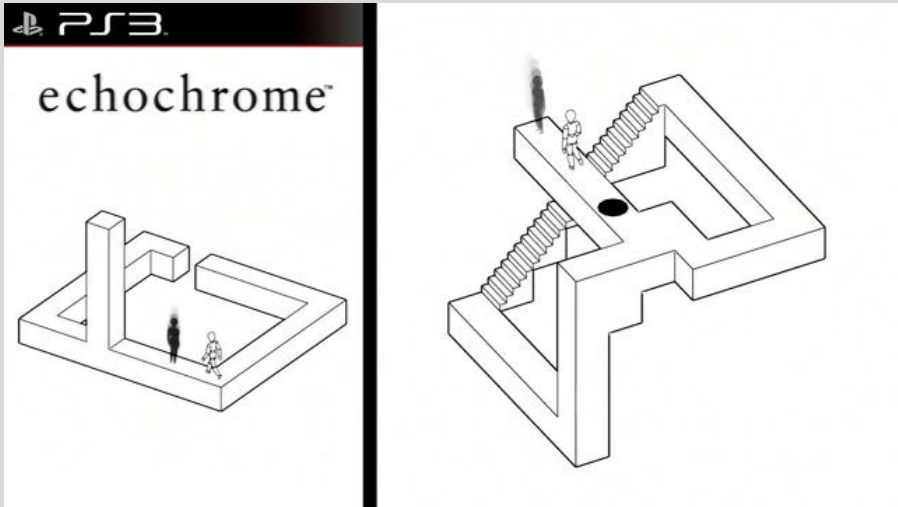


Pull-out file cabinet of Dig Deeper books & materials

Featured Works

Echochrome

2008



Developer: Will Japan Studio

Platform: PlayStation

In ***Echochrome***, players can rotate the camera to manipulate optical illusions that connect seemingly disconnected spaces, guiding an autonomously walking wooden mannequin across three-dimensional geometric surfaces to follow its own “shadow” and complete the path.

Playable: Levels A1–A5

Game category: Indie

Monument Valley

2014



Developer: ustwo games

Platform: Windows, macOS, PlayStation, Xbox, Nintendo Switch, Android, IOS

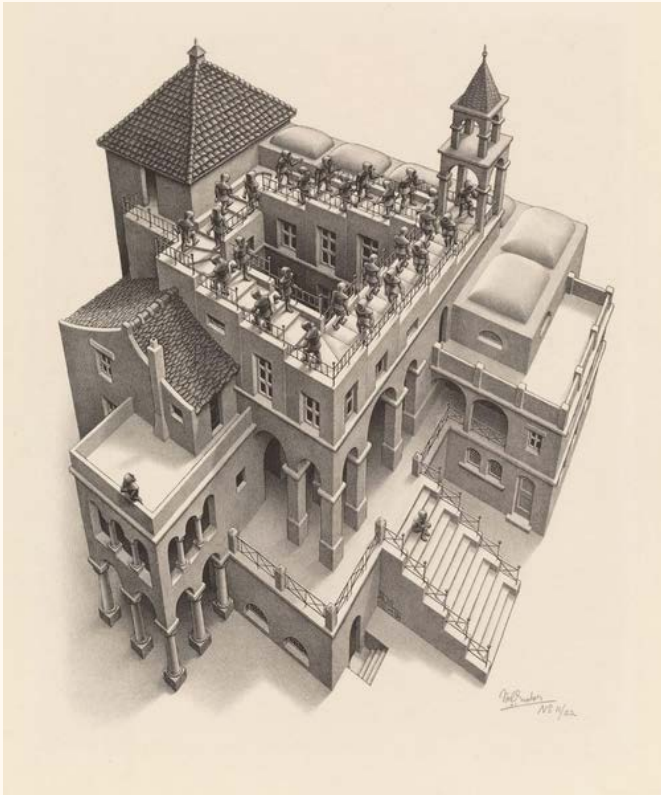
Monument Valley is a meditative puzzle game that explores impossible architecture and optical illusions. Players guide Princess Ida through surreal structures by rotating, shifting, and manipulating the environment to reveal hidden paths. Its core spatial mechanic is built on optical illusions created by the relative positions of architectural elements—paths align only when viewed from the correct perspective.

Playable: First chapter

Game category: Indie

Ascending and Descending

1960



Author: M.C. Escher

Format: lithograph

Ascending and Descending is a lithograph print by the Dutch artist M. C. Escher first printed in March 1960. The lithograph depicts a large building roofed by a never-ending staircase. Two lines of identically dressed men appear on the staircase, one line ascending while the other descends.

Impossible Triangle Monument

1999, Perth, Australia



Author: Brian McKay and Ahmad Abas

This installation recreates the illusion of the **Penrose Triangle**, one of the most iconic impossible objects.

Although physically composed of separate structural elements, the form aligns into a perfect “impossible triangle” only from one specific viewing point.

The work demonstrates how spatial arrangement and perception can transform a real structure into an impossible figure.

Perspective

2012



Developer: Widdershins

Platform: Windows

In **Perspective**, players control a character moving on a 2D plane while the screen shifts according to the player's viewpoint in 3D space. When adjusting the camera, the character remains fixed, allowing players to find an angle where fragmented paths visually align and become traversable.

Playable: First 10 minutes

Game category: Experimental

The Ambassadors

1533



Author: Hans Holbein the Younger

Format: Oil on oak

Hans Holbein's **The Ambassadors** is a double portrait that also includes a detailed still life of meticulously rendered objects. The painting is best known for its anamorphic skull, visible only from a precise viewing angle, making it one of the most striking examples of distorted perspective in Western art.

Viewfinder

2023



Developer: Sad Owl Studios

Platform: Windows, PlayStation, Xbox, Nintendo Switch

In **Viewfinder**, players use a camera to take photographs and, by placing or rotating them, project images from photos or other two-dimensional works into the game's three-dimensional world, creating new geometries and layouts that are used to solve puzzles.

Playable: Chapter 1

Game category: Indie

Shadowmatic

2015



Developer: Triada Studios

Platform: iOS, Android, Apple TV

Shadowmatic is a puzzle where the player rotates abstract objects in a spotlight to find recognizable silhouettes in projected shadows, relevant to the surrounding environment.

Playable: First three chapters

Game category: Experimental

Moncage

2021



Developer: Optillusion

Platform: Windows, Nintendo Switch, iOS

Moncage is a puzzle adventure set inside a mysterious cube, where each face reveals a distinct miniature world. Players rotate the cube to align elements across scenes, creating visual illusions that connect fragmented spaces. Its core spatial mechanic transforms perspective alignment into the key to discovery and progression.

Playable: First chapter

Game category: Indie

Portal 2

2007



Developer: Valve

Platform: Windows, macOS, Linux, PlayStation, Xbox, Nintendo Switch

In **Portal 2**, players use a “portal gun” to create linked gateways between two locations, solving spatial puzzles by moving themselves or transporting objects through these portals. The game features both a single-player campaign and a cooperative mode.

Playable: First chapter

Game category: AA

Doctor Strange

2016



Directed by: Scott Derrickson

Written by: Jon Spaihts, Scott Derrickson, C. Robert Cargill

Based on: Doctor Strange by Stan Lee, Steve Ditko

Doctor Strange is an American superhero film based on the Marvel Comics character of the same name. It tells the story of a neurosurgeon who enters a hidden world of magic after a life-changing accident. In this universe, sorcerers can manipulate space by drawing circular energy portals, allowing seamless travel between distant locations.

Superliminal

2019



Developer: Pillow Castle

Platform: Windows, macOS, Linux, PlayStation, Xbox, IOS, Nintendo Switch, Android

In *Superliminal*, the game is presented in a first-person perspective, combining optical illusions and forced perspective mechanics. By changing the player's viewpoint, objects appear to shift in size, allowing puzzles that once seemed impossible to be solved and the player to progress through the game.

Playable: First two chapter

Game category: Indie

Ames room

1940



Inventor: Adelbert Ames Jr.

The **Ames Room** is a distorted space designed to appear perfectly rectangular from a fixed viewpoint. Because its walls, floor, and ceiling are built at misleading angles, people who moves from one corner of the room to the other appears to change dramatically in size. The experiment shows that perspective can deceive our sense of size and depth.

Maquette

2021



Developer: Graceful Decay

Platform: Windows, Xbox, PlayStation, Nintendo Switch

In **Maquette**, players explore a self-contained, recursive world where the outer environment mirrors the miniature model at each level's center. Placing objects on the model simultaneously alters the larger world, enabling access to new areas or items needed to solve puzzles.

Playable: First three chapter

Game category: Indie

The Twilight Zone

Small Town

2020



Director: Alonso Alvarez

Writers: Steven Barnes, Tananarive Due

In “**Small Town**,” a church handyman discovers a magical scale model that alters the real town whenever he changes it. As he quietly improves the struggling community, the new mayor takes credit for his work. The story explores power, perspective, and how an object can control things in life.

Dishonored2

(A Crack in the Slab)

2016



Developer: Arkane Lyon

Platform: Windows, PlayStation, Xbox

A *Crack in the Slab* from *Dishonored 2* introduces a time-manipulation mechanic that lets players instantly switch between two timelines—the present and the past. Players solve puzzles and navigate guarded areas by observing cause-and-effect relationships across time, creating dynamic routes and stealth opportunities that blend temporal strategy with spatial design.

Playable: A Crack in the Slab chapter

Game category: AA

Titanfall 2

Effect and Cause

2016



Developer: Respawn Entertainment

Platform: Windows, PlayStation, Xbox

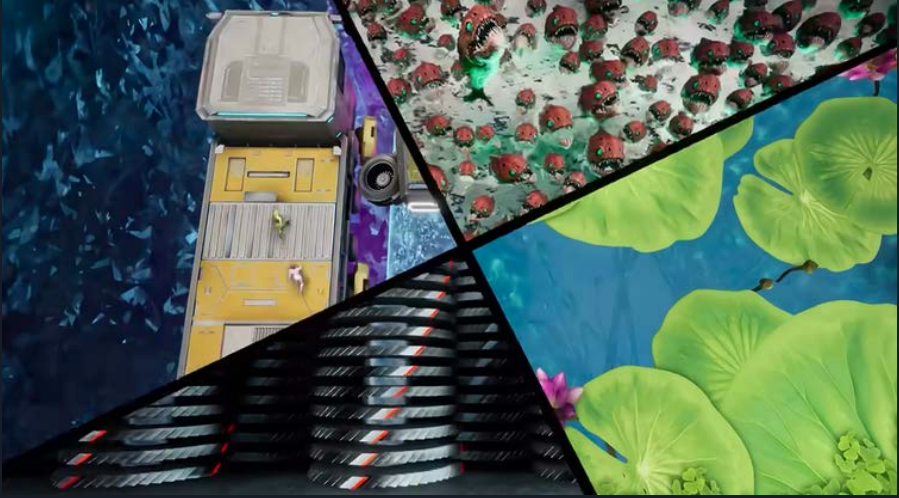
The “*Effect and Cause*” mission in *Titanfall 2* redefines spatial design through time manipulation. Players seamlessly switch between two versions of the same facility—its ruined present and its intact past—to navigate, solve spatial puzzles, and fight enemies. The core mechanic fuses architecture and time, transforming space itself into a dynamic, dual-layered environment.

Playable: Effect and Cause chapter

Game category: AAA

Split Fiction

Split
2025



Developer: Hazelight Studio

Platform: Windows, PlayStation, Xbox, Nintendo Switch

Production categories: AAA

In the “**Worlds Apart**” and “**Cross Section**” sections of the “**Split**” chapter in **Split Fiction**, players connect two differently styled spaces, allowing them to break the split-screen boundary and slip into the other world to avoid danger.

Playable: World Splitting and Cross-Sections

Game category: AA

Dishonored2

Clockwork Mansion

2016



Developer: Arkane Lyon

Platform: Windows, PlayStation, Xbox

Clockwork Mansion transforms architecture into a living puzzle. With the press of a lever, walls shift, floors rotate, and entire rooms reconfigure in real time. Players must adapt to this constantly changing environment, using both stealth and creativity to exploit the mansion's mechanical systems and uncover hidden routes within its layered design.

Playable: No (Video reel)

Game category: AA

Control

Ashtray Maze

2019



Developer: Remedy Entertainment

Platform: Windows, macOS, PlayStation, Xbox, Nintendo Switch

In the **Ashtray Maze** from **Control**, players traverse a shifting labyrinth where corridors twist and architecture constantly reconfigures. Though powered by simple pre-baked Houdini simulations, the maze's modular design enables cascading transformations that feel complex and alive. The true artistry lies in the precise placement of each element to sustain the illusion of seamless motion.

Playable: No (Video reel)

Game category: AAA

Dig Deeper

Papers

Impossible objects: A special type of visual illusion, Penrose, L. S., & Penrose, R. (1958)

'Theorizing Navigable Space in Video Games' Wolf, M. J. P. (2000)

'Allegories of Space. The Question of Spatiality in Computer Games' Aarseth, Espen (2001)

"Impossible Figures", Macpherson, F. (2010)

Neural computations underlying depth perception, Anzai, A., & DeAngelis, G. C. (2010)

'Recursive Space: Play and Creating Space Wood' Aylish. (2012)

A century of Gestalt psychology in visual perception: I. Perceptual grouping and figure-ground organization, Wagemans, J., Elder, J. H., Kubovy, M., Palmer, S. E., Peterson, M. A., Singh, M., & von der Heydt, R. (2012)

Investigation on light effect on spatial illusion resulting from forced perspective, Nan-Ching Tai, (2016)

'The Spectacular Space: Rules and Guiding Principles of Irrational Spaces in Games' Bauer, R. et al. (2019)

**'THE REPRESENTATION OF SPACE AS A NARRATIVE
LANGUAGE IN VIDEOGAMES' Attademo, Greta. (2022)**

**The Nature of Illusions: A New Synthesis Based on Verifiability,
Christopher W Tyler (2022)**

**Using Illusions to Track the Emergence of Visual Perception
Cavanagh, Annual Reviews Vision. (2023)**

Books

**Impossible Objects: Amazing Optical Illusions to Confound and
Astound, J. Timothy UnruhJ. Timothy Unruh (2002)**

Optical Illusions Hardcover, DK (2012)

An Architectural Approach to Level Design, Chris Totten, (2014)

**The Perception and Cognition of Visual Space, Paul Linton
(2017)**

The Art and Making of Control (2020)

Creator Interviews

[ustwo at Nordic Game 2014: Making of Monument Valley in Unity](#)

[Monument Valley 3: Blurring art and design](#)

[Viewfinder Developer Interview](#)

[Key inspiration of Moncage: Unity 3D - Portal Room Cubes via Stencil Buffer](#)

[Portal 2: Creating a Sequel to a Game That Doesn't Need One](#)

[GDC Plays Superliminal with Pillow Castle Games' Albert Shih](#)

[The Making of Titanfall 2's 'Effect and Cause', Revealed by Respawn Entertainment Senior Designer](#)

[Dishonored 2 Devs Explain the Clockwork Mansion](#)

[Inside the Making of Dishonored 2's Best Level: A Crack in the Slab](#)

[An Approach to Holistic Level Design](#)

[How Control's Most Ambitious Level Was Created | Audio Logs](#)

[Escher and Monument Valley](#)

[We Ask Indies: Pohung Chen, one of the guys behind amazing first person perception puzzle Perspective!](#)

Perspective on Perspective

Postmortem: Developing Viewfinder, a Surreal Perception-Bending Puzzle Game

Interview: Valve on their insane Portal 2 ideas

Pillow Castle reveals the tech that makes their surreal puzzler tick.

Designing the mind-bending perspective puzzles of Superliminal

The recursive world simulation & puzzle-making process in Maquette

Interview: Maquette's Creative Director on Building a Recursive World Puzzle Game for PS5

Industry Articles

Playing with Perspective

Mechanics, Depth, and Portal 2

Films

Nolan, Christopher. Inception (2010)

Doctor Strange (2016)

Spider-Man: Into the Spider-Verse (2018)

Spider-Man: Across the Spider-Verse (2023)

Squid Game, Season 2 (2024)

TV Series

Love, Death & Robots, Season 1, Episode 16: “Ice Age” (2019)

The Twilight Zone, Season 2, Episode 8: “Small Town” (2020)

Concept Videos/ Video Essay

Tokyo Metropolitan Government. “Old Meets New – Tokyo Tokyo Concept Video.” Tokyo Tokyo Official. (2017)

“Back To First Back To Future.” Official concept promotional film for the 2019 FIRST International Film Festival. (2019)

StudioBinder. “The Split Screen – The Ultimate Guide for Filmmakers”. Video Essay. (2023)

Architecture

Ricardo Bofill Taller de Arquitectura. Selected Projects by Postmodernist Master Ricardo Bofill.