



The Metaverse & Flight Simulation

—

Dead or Resting?

Andy Fawkes FIMechE MRAeS
RAeS Flight Simulation Conference
London | 23 October 2024



Outline

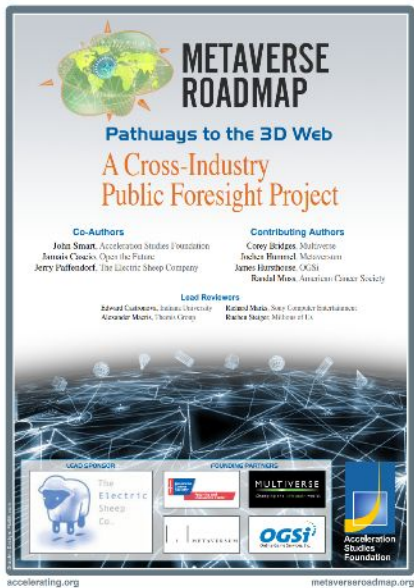
- **Why Should We Care?**
- **What is this Metaverse Thingy?**
- **Trends in Interactive 3D Digital Tech**
- **Looking to the Future for Flight Simulation**

Why Should We Care?

Impacts

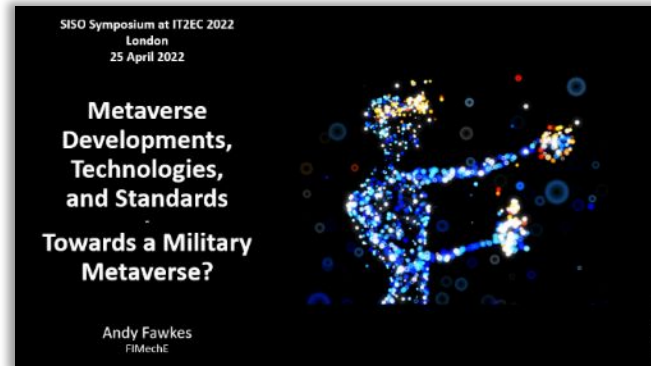
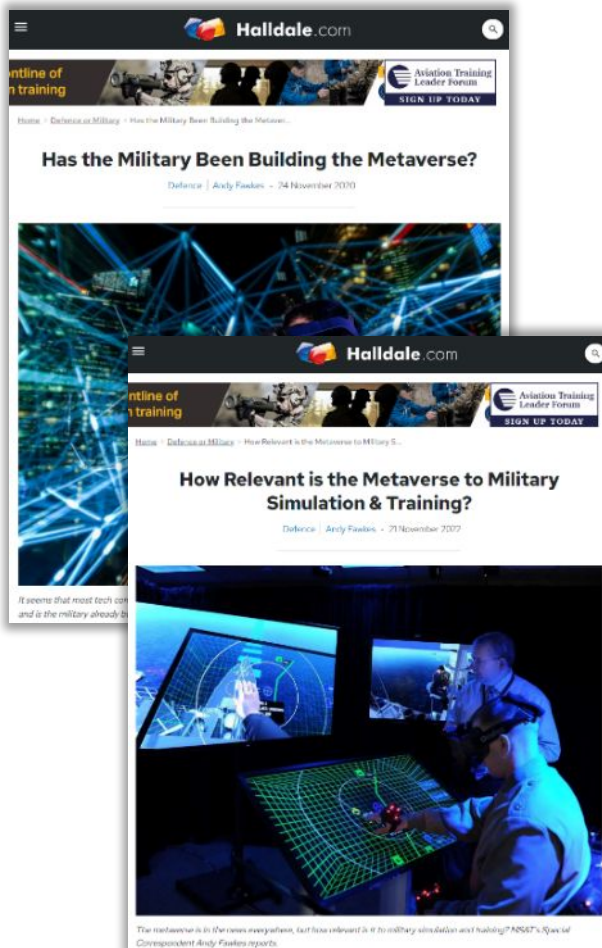
- **Aerospace Training and Operations**
- **Aerospace Engineering**
- **The future of a more immersive and interactive cyberspace**
- **Some of this future is happening already**

My Metaverse Background



2007

2020 & 2022



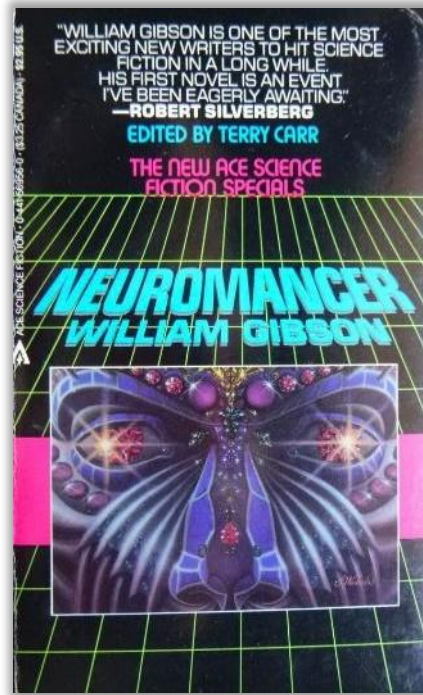
2022 & 2022



2022 & 2023

What is this Metaverse Thingy?

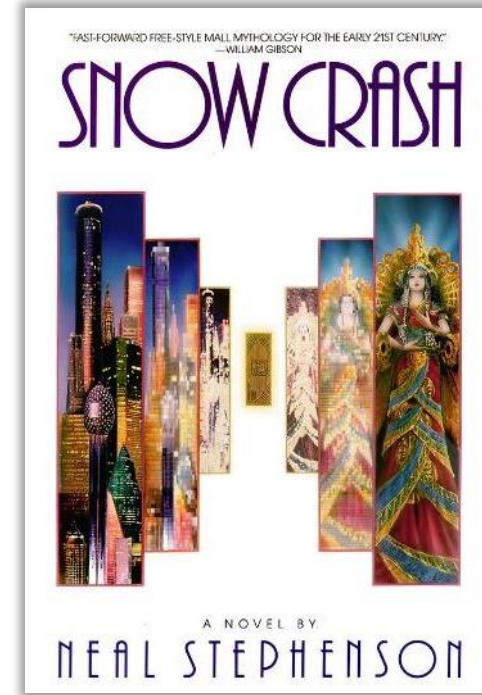
It's All Science Fiction!



1984

“Cyberspace”

a "*mass consensual hallucination*"
in computer networks



1992

“Metaverse”

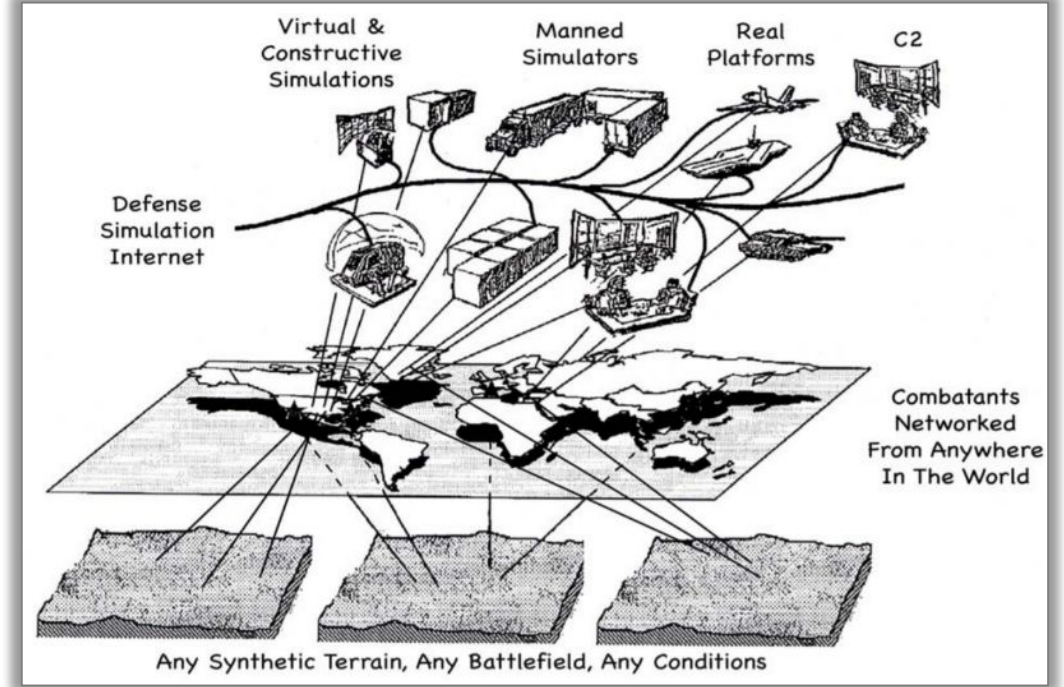
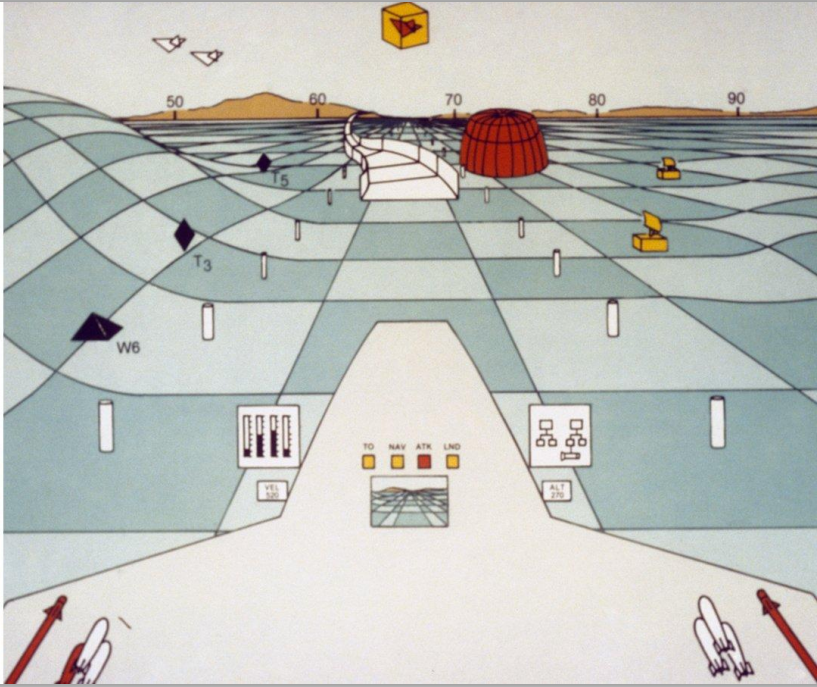
"meta" (meaning beyond) and "universe"
"*... a computer-generated universe ...*"

Physical World	→	Digital World
	←	

By Early the 1990s



USAF “Super Cockpit” (1986) (DVIDS)



US DARPA/Army SIMNET (1980s)

By Early the 1990s



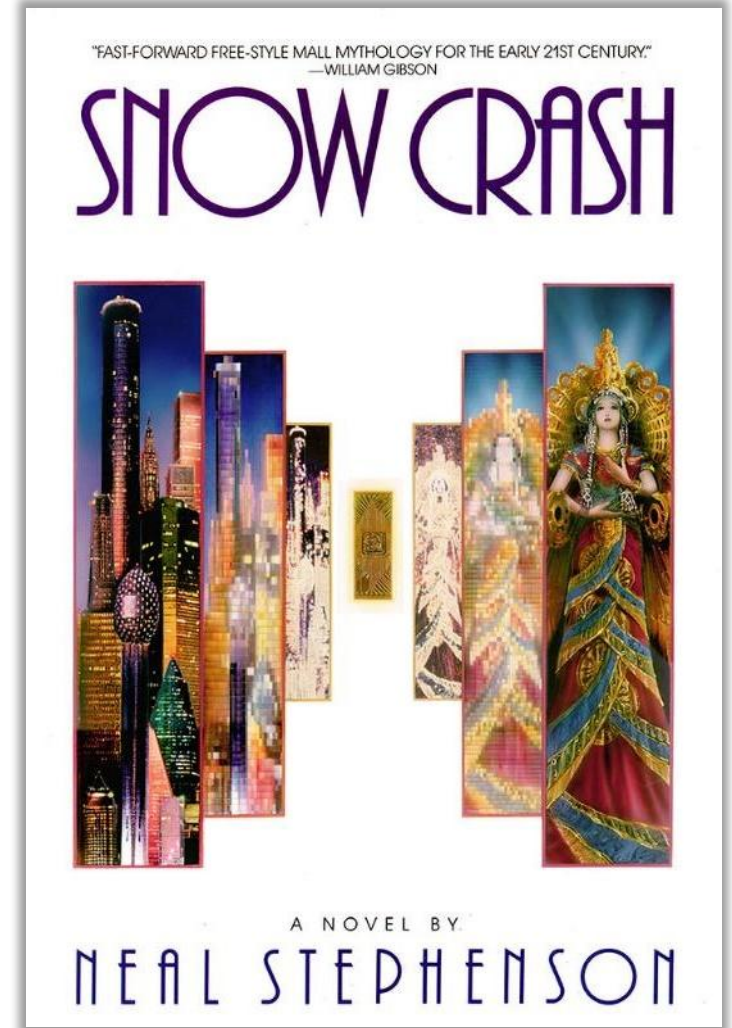
Virtuality "Dactyl Nightmare" (1991) Multi-player VR

https://youtu.be/hBkP2to1P_c?si=5laoX-72-EikqOiR

Enter the
“Metaverse”!



1959 - present



**Interactive Shared
Virtual Space**

-
Avatars

-
**Transportation
between “Ports”**

-
AI Bots & Librarian

-
**“*Snow Crash*” is
both a Computer
Virus & a Real Drug**



Snow Crash's Metaverse “Goggles” and Earphones

(as imagined by ChatGPT)



The Metaverse Now

Themes/ Building Blocks

XR

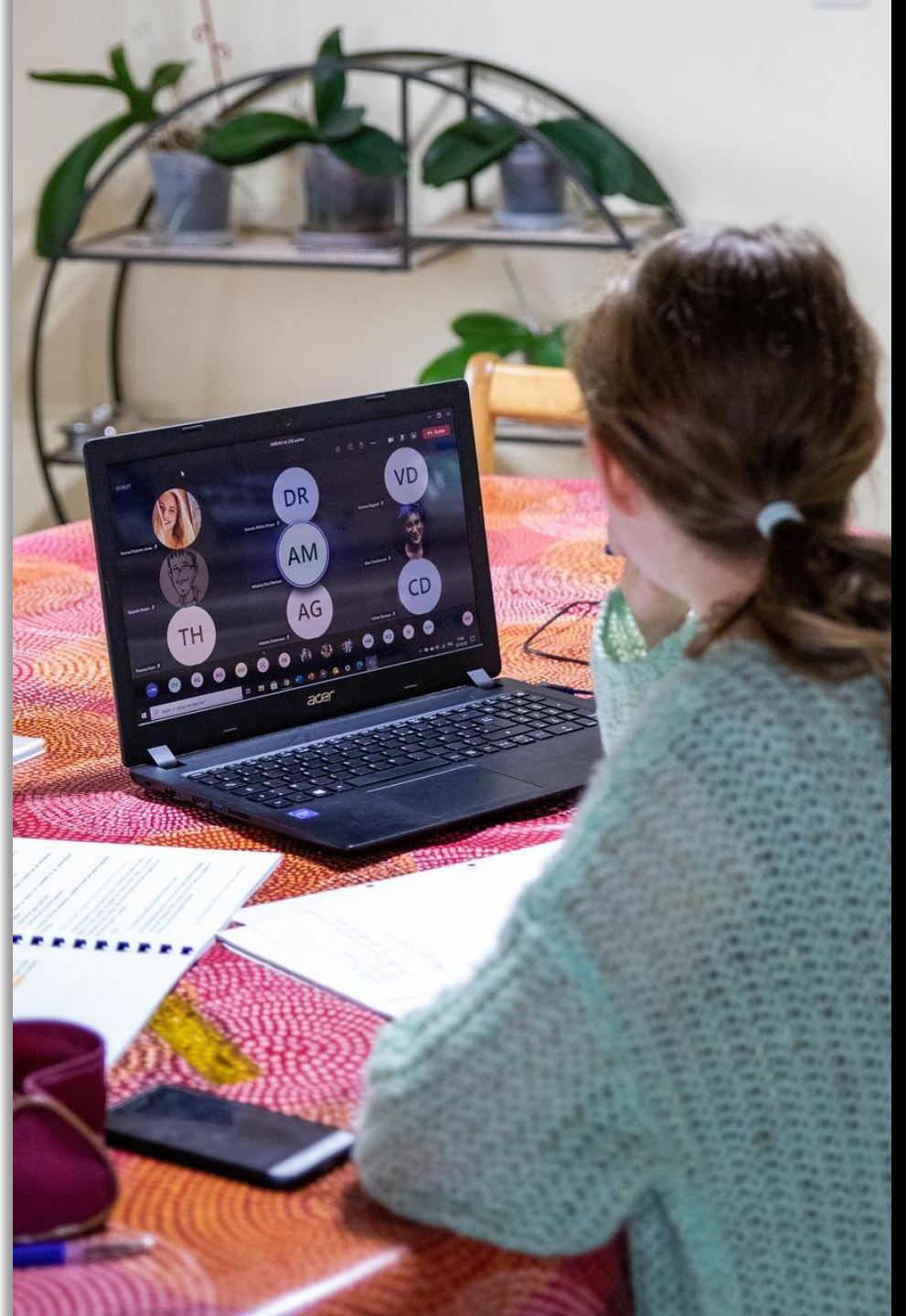
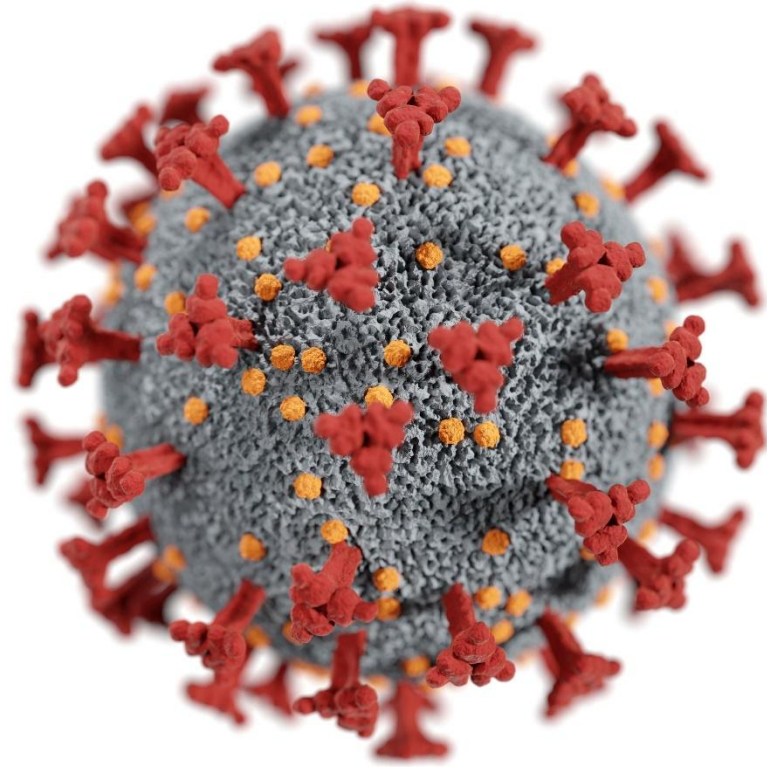
Virtual Worlds

Digital Twins

**Open
Ecosystems &
Standards**

AI

2020



The Metaverse was all Over the News in 2021



Unity



Roblox



Microsoft



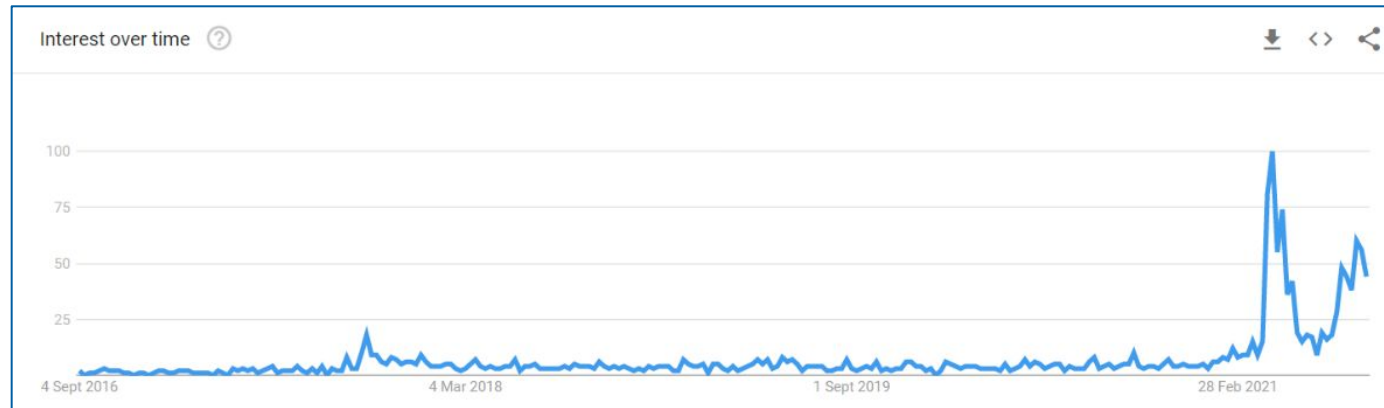
Facebook



Epic Games

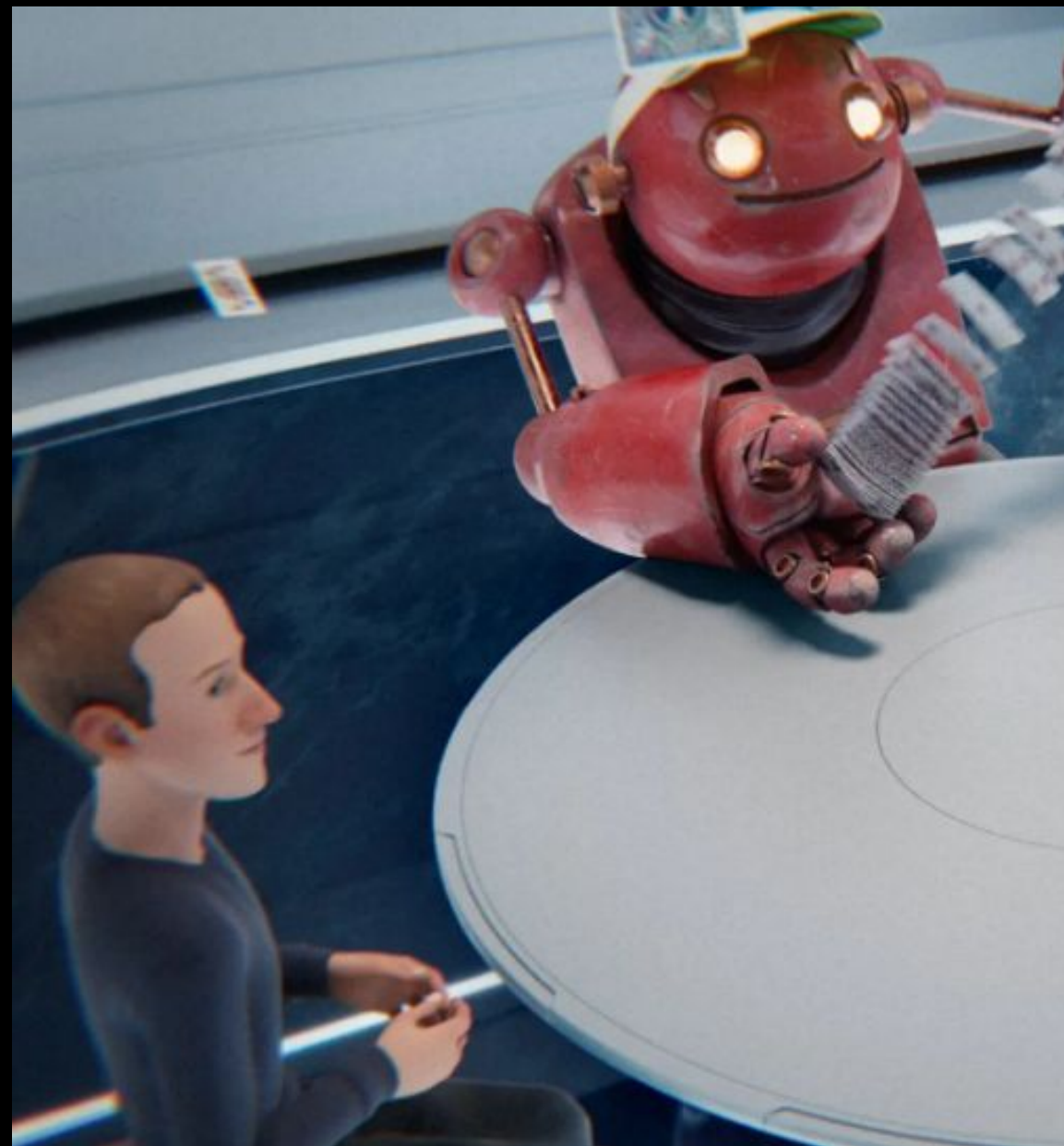


Nvidia

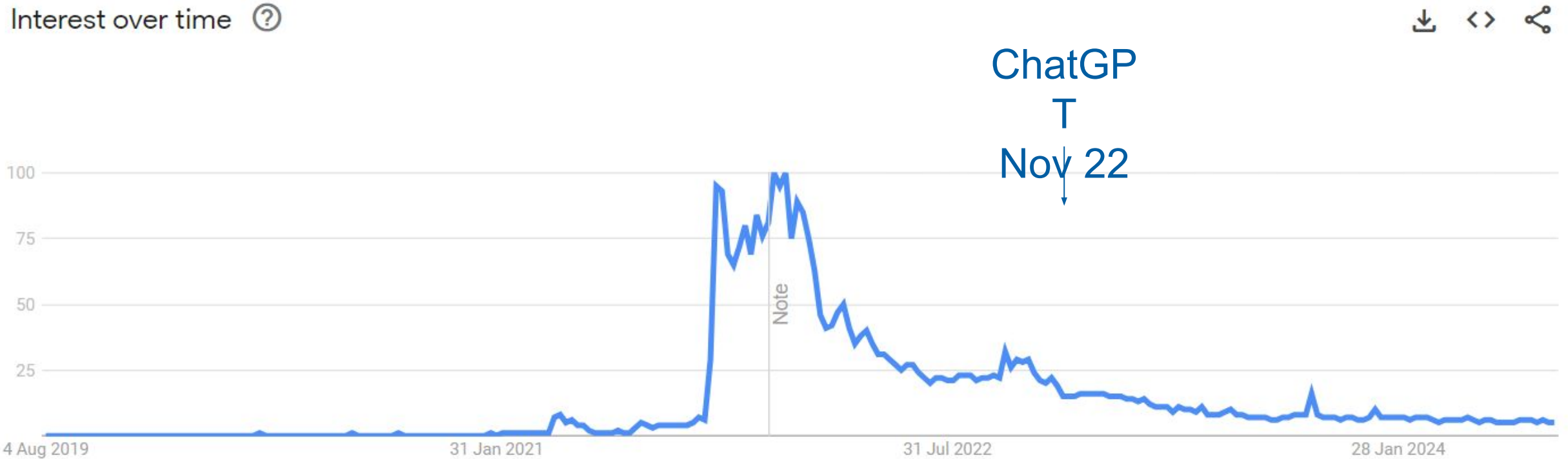


Google Word Search

“Facebook” → “Meta” – October 2021



The Death of the Metaverse



Google Trends

The Death of the Metaverse

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3 Metaverse Stocks to Sell in August Before They Crash & Burn

The metaverse is proving to be a money pit for the deeply tied to the virtual world

15h ago · By Rich Duprey, InvestorPlace Contributor

- The metaverse is proving to be more fad than trend making those that went all-in on it metaverse, stocks to sell.
- **Unity Software (U)**: The gaming software engine maker was going to power the metaverse's virtual world but failed to achieve any gains or profits.
- **Roblox (RBLX)**: The teen gaming platform is closely tied to the metaverse, and while still attracting users is seeing falling sales and a lack of profitability.
- **Roundhill Ball Metaverse ETF (METV)**: Putting all the metaverse eggs in one basket has not worked out well for this ETF.

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5 Things That Killed The Metaverse

In less than two years since genesis, the metaverse has already met its demise. Here are five reasons why we'll never see the metaverse again.

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The Observer The metaverse

This article is more than 1 year old

A moment's silence, please, for the death of Mark Zuckerberg's metaverse

John Naughton



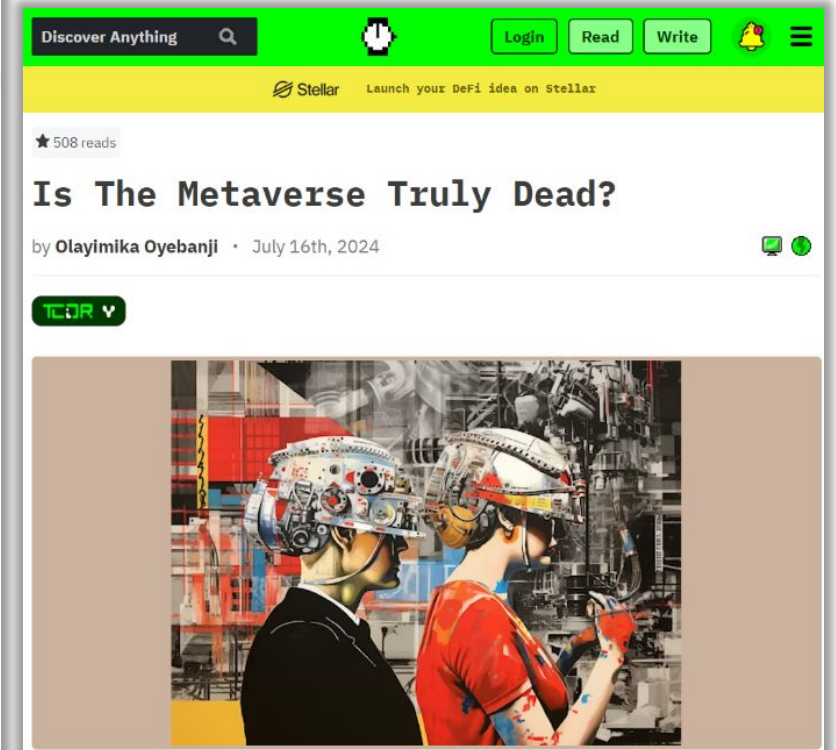
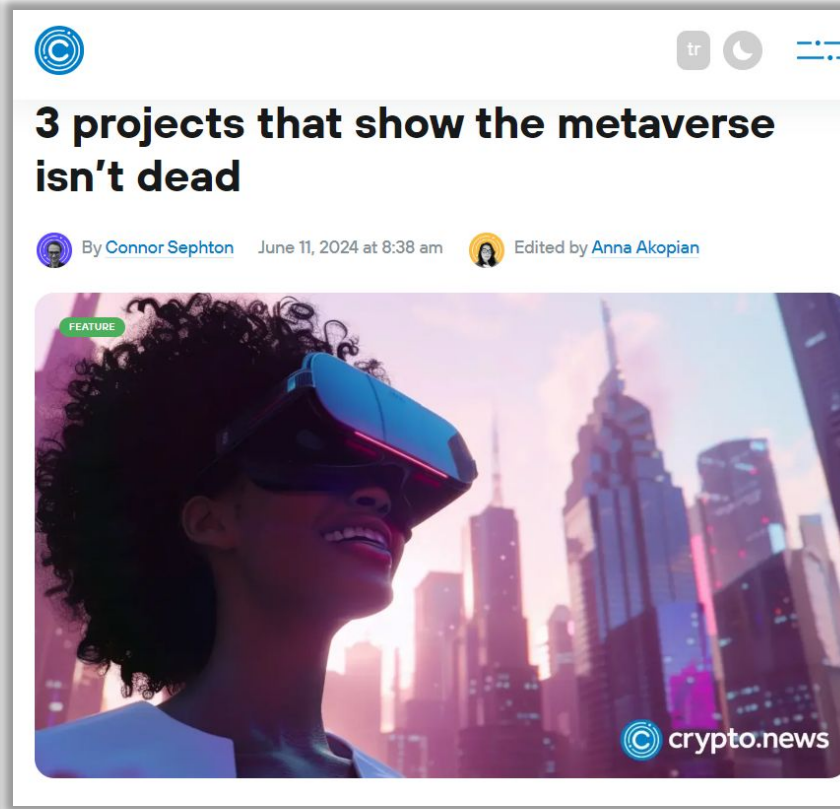
Meta sank tens of billions into its CEO's virtual reality dream, but what will he do next?

Sat 13 May 2023 16:00 BST

[Share](#) 206



The Death of the Metaverse - Maybe ...



Rumours of its Death have been Exaggerated?

What is this Metaverse Now?

- **Spatial Computing?**

- Techniques focused on blending digital content with the physical world.

- **Immersive Technology?**

- Digital tools that create engaging, interactive experiences, often making users feel part of a virtual environment.

- **Web 4.0?**

- A more intelligent, personalized, immersive, and decentralised Internet.

- **Extended Reality?**

- The spectrum from physical reality to virtual reality

Trends in Interactive 3D Digital Technology

The Metaverse Now

Themes/ Building Blocks

XR

Virtual Worlds

Digital Twins

**Open
Ecosystems &
Standards**

AI

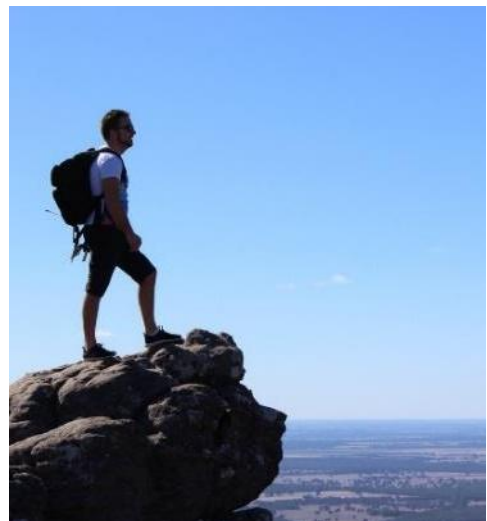
**The Potential
Number of
Developments to
Present ...**



eXtended Reality (XR)

Reality

The physical world



Augmented Reality

Information layered over physical world



Mixed Reality

Blend of real & digital information



Virtual Reality

Fully virtual world



XR in Warfare



https://youtu.be/4vWuEKHE6Xc?si=EoS_9x1qEuNdlb8j

XR Gaming Skills

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Call of Duty: Defence secretary John Healy wants online gamers to join up for real to become drone pilots as he plans to ease entry requirements for 'console warriors'

By [DAVID WILCOCK](#), DEPUTY POLITICAL EDITOR FOR MAILONLINE

PUBLISHED: 14:28, 22 September 2024 | UPDATED: 14:28, 22 September 2024



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XR Drone Racing League (DRL)

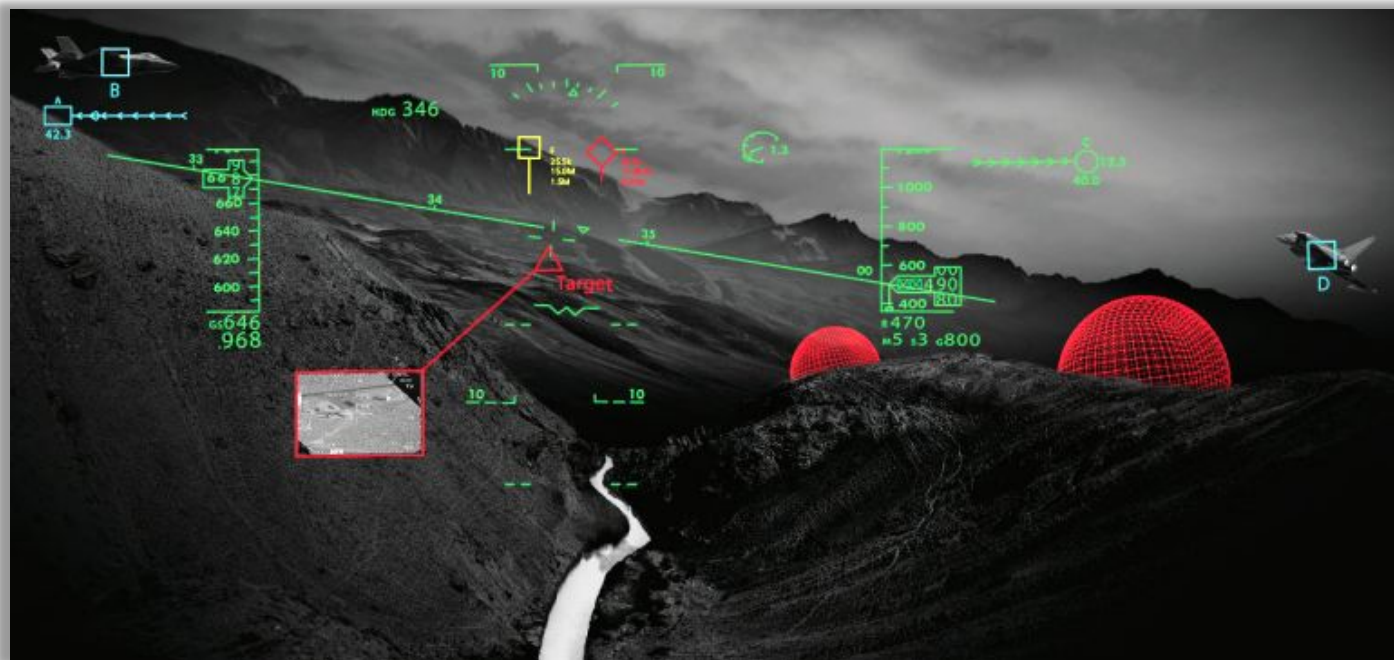
&

Drone Racing League Simulator



XR

BAE Systems Striker® II



XR - BMW M Mixed Reality



XR

Meta Project Orion



Emteq Labs “Sense”

Facial Expression Smart Glasses

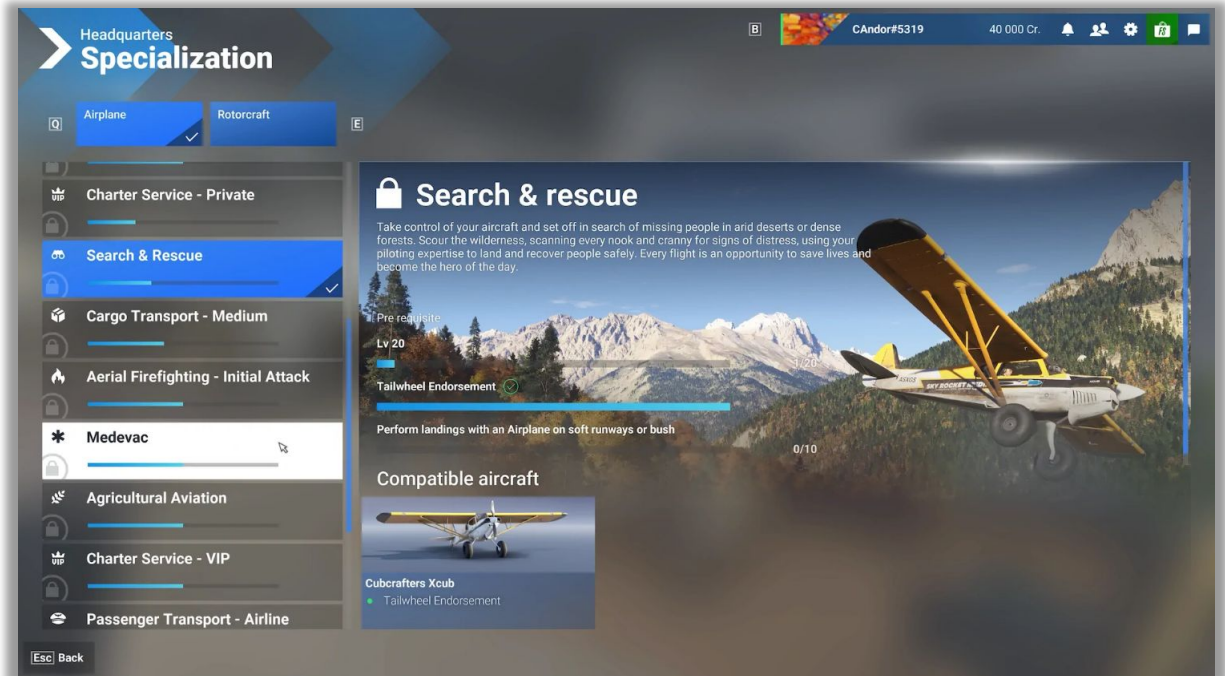
-  Eating behaviour
-  Attention
-  Engagement & Valence
-  Facial expressivity
-  Activity (walking, sitting, reading etc.)
-  Regulatory Compliance CE mark, RoHS, WEE.



THINKE

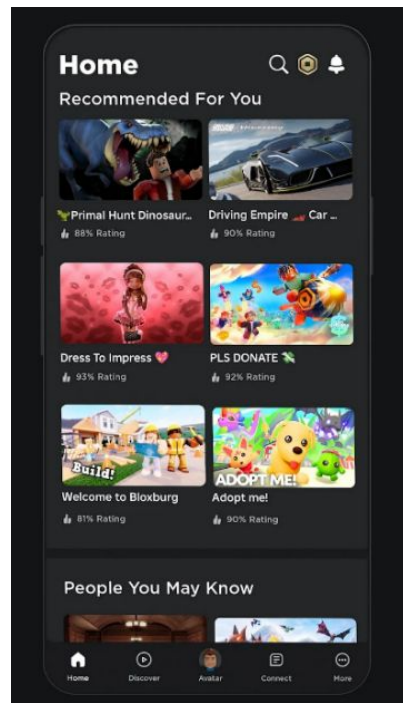
Virtual Worlds

Microsoft Flight Simulator 2024 Career Mode



Virtual Worlds

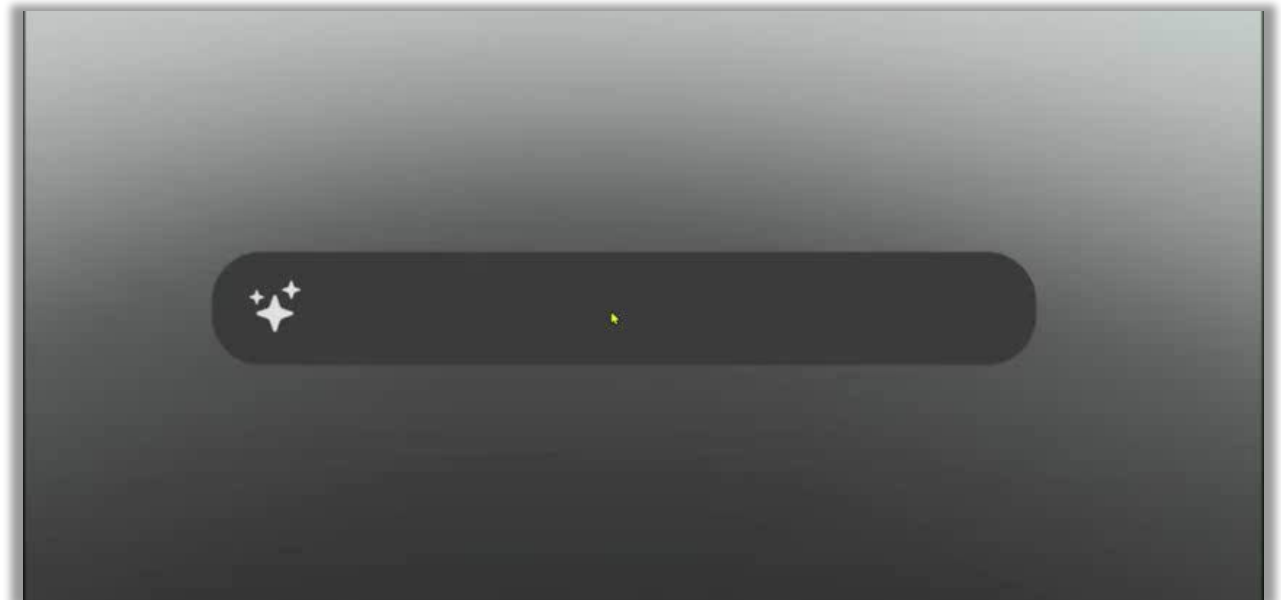
Roblox



Announced 6 Sept – Open source generative AI tool in development “the 3D Foundational Model”

ROBLOX

- Some Key Points (Sep 24)
 - User Growth: 79.5M daily users
 - Future Ambition: Aiming for 1bn daily users;
 - New creator earning methods include physical merchandise



Virtual Worlds

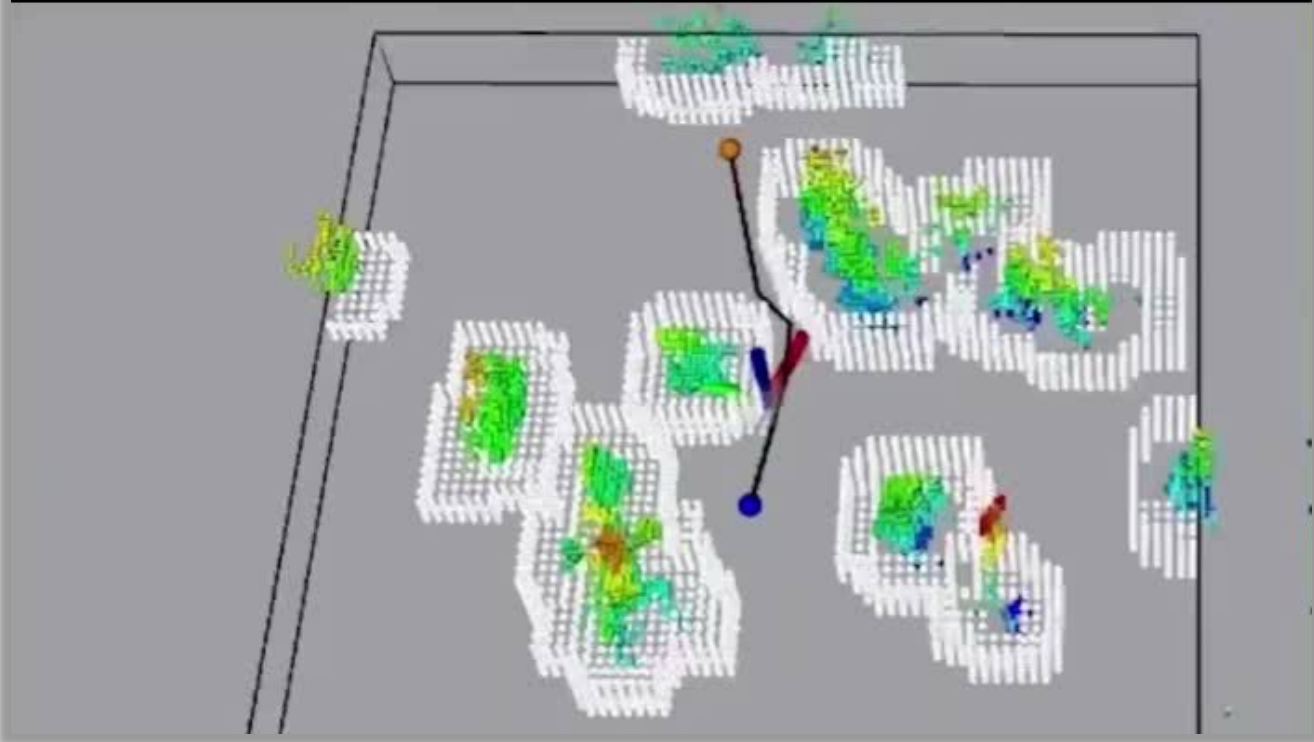
Dynamic Server Meshing

Epic Games Unreal 5.5



Virtual Worlds

Performance Drone Works (PDW)



Digital Twins are Intrinsic to the Metaverse



(Metaverse) Enterprise Standards Framework

Theme	Sub-Themes	Example Standards
3D Content	Objects, Materials, Rendering	glTF, OpenUSD, OpenPBR, MaterialX, OpenFlight, Digital Twins
3D Worlds	Geospatial, Human-Built, Biomes	CDB, CityGML, 3D Tiles, BIM, ISO 19107, OGC API - 3D GeoVolumes
Sim-Sim Interoperability	Models, Comms	HLA, DIS, DSEEP, SpaceFOM, TENA
Sim-Others Interoperability	Software, Hardware	Cyber DEM, C2-SIM, CIGI, UCATT, Link 11/16, WebLVC, OpenXR, WebXR
Networking	Performance, Wireless, Security	5G/6G, WiFi 7, ISO/IEC 27033
User Experience	Safety, UX, Performance Tracking	ISO 45001, ISO/IEC 5927:2024, ISO 25010, xAPI, Caliper Analytics
Governance	Security, VV&A, Privacy, Ethics	ISO/IEC 27001, IEEE 1012, ISO/IEC 27701, GDPR, IEEE 7000

3D Digital Standards

XR

OpenXR

Virtual Worlds

OpenUSD

Digital Twins

**Open
Ecosystems &
Standards**

AI

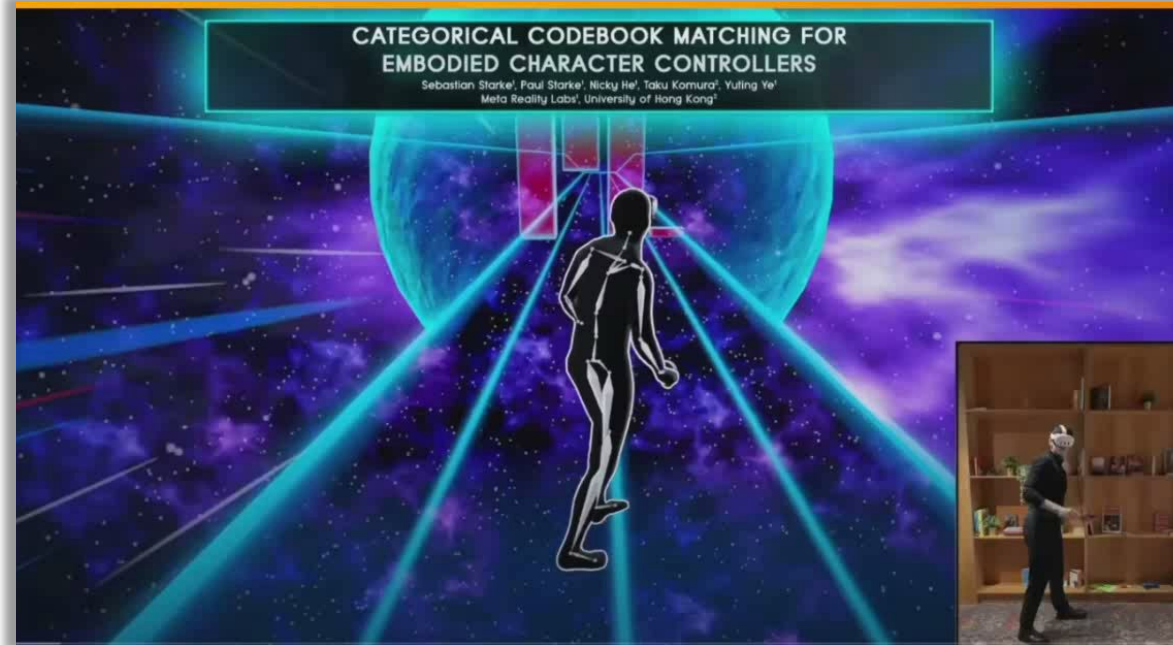
AI

Unity 6

“Sentis” AI

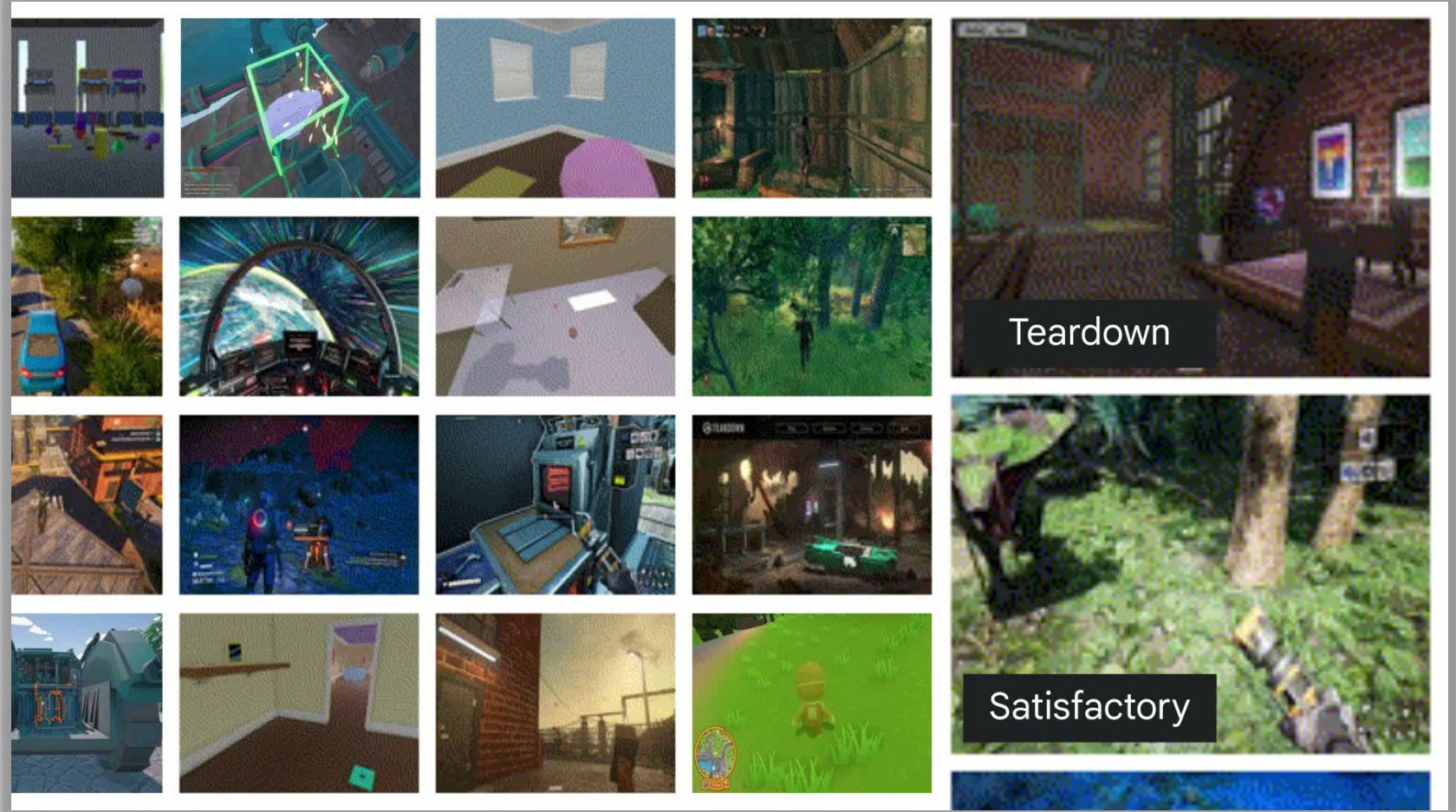
(9 Oct 24)

<https://youtu.be/T-sbHvDF6Bw?si=6BBJmWnWPJRXtM-U>



AI Learning from video games

Google DeepMind SIMA (2024) (Scalable Instructable Multiworld Agent)



AI

From GPUs to AI

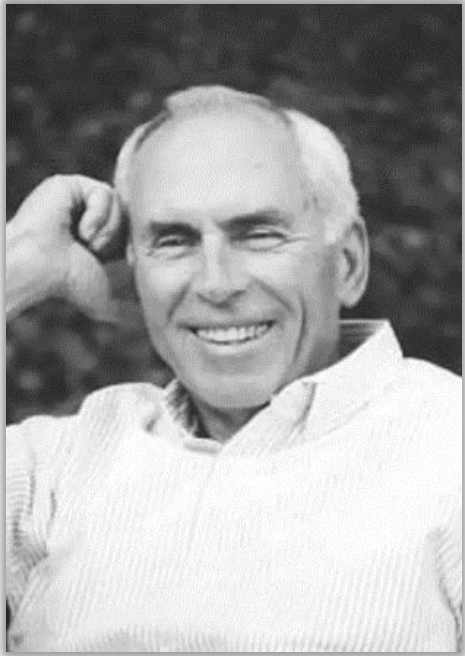


https://youtu.be/XBrAomadM4c?si=jo03hXH-_Qx0n0d2

THINKE

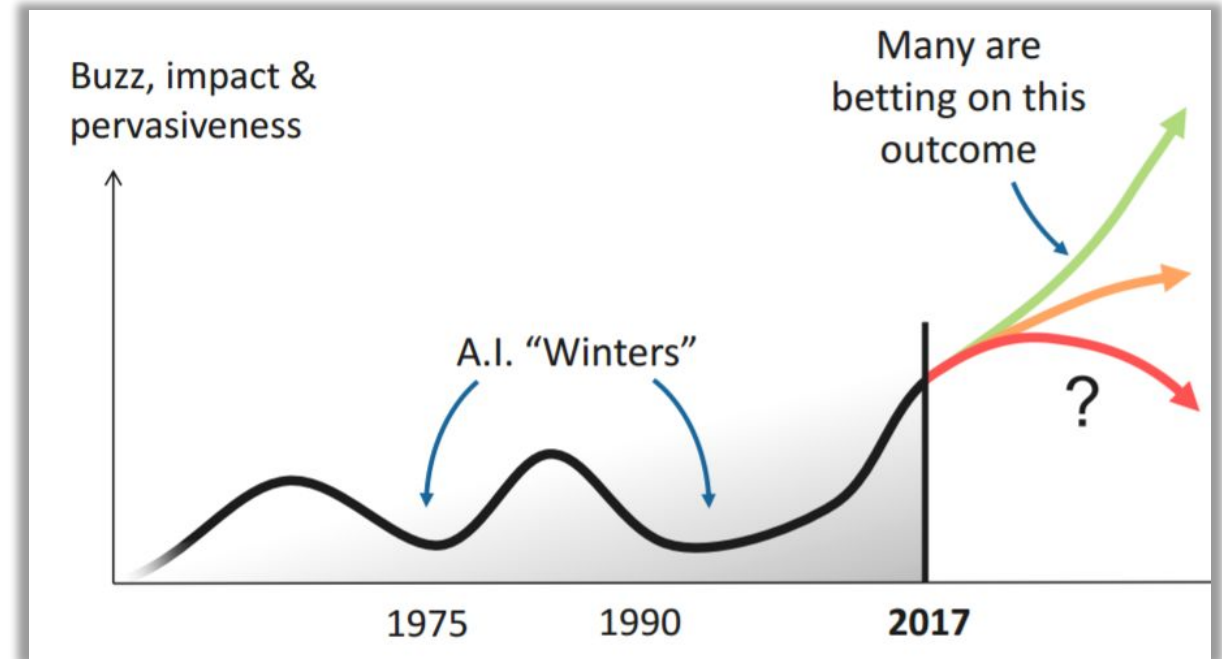
Looking to the Future for Flight Simulation

Technology Prediction ...



“We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.”

Roy Amara (1925 – 2007)
Head Stanford Institute for the Future



“AI Winters”

Rift Drone (2014)

AR.Drone 2.0
Oculus Rift
Unity

Xbox 360 Controller
Open-Source Software

<https://github.com/daraosn/oculus-drone>

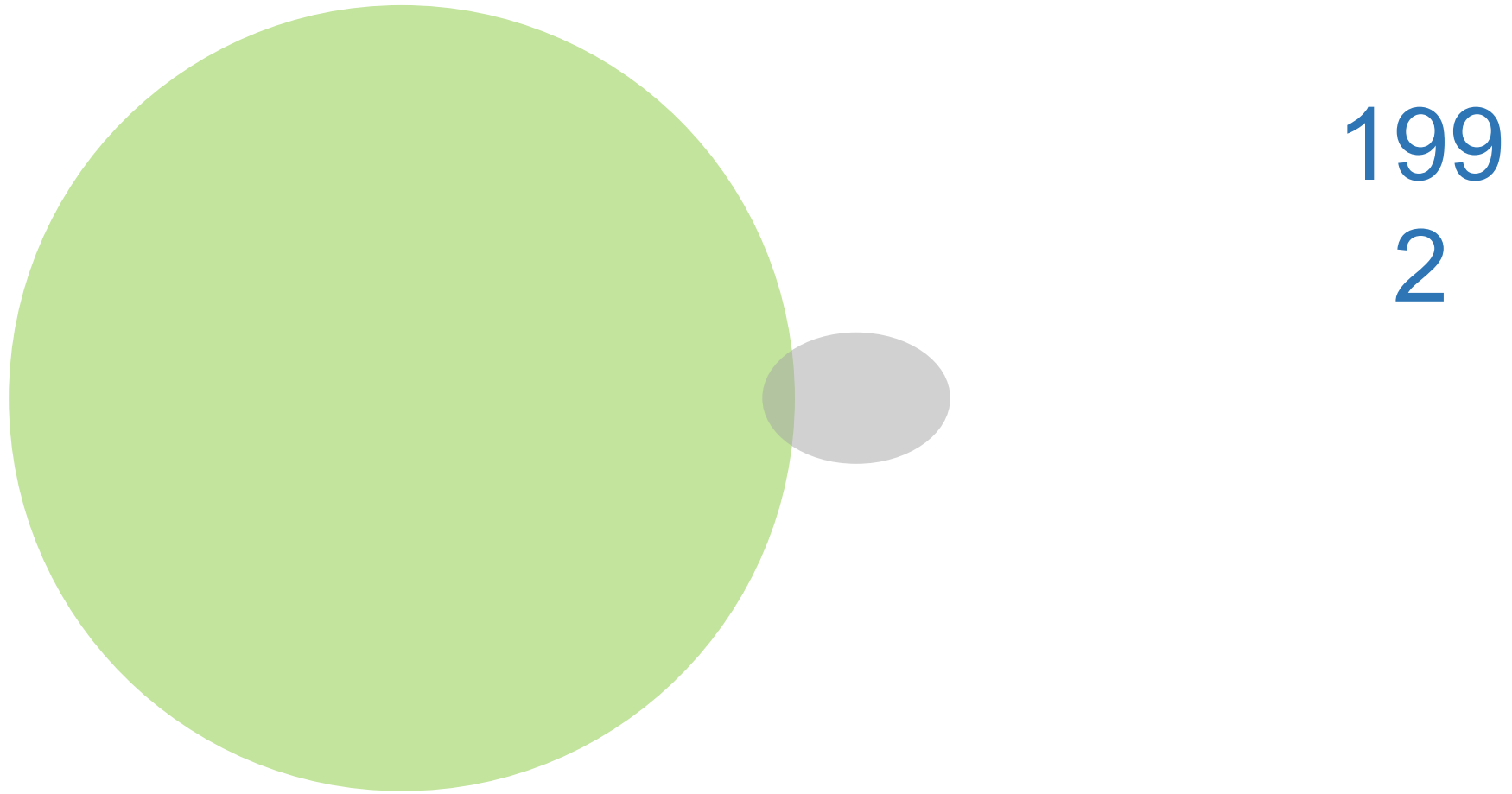


https://youtu.be/3WmQ1_8ytaM?si=nsmukHRH8IEMI33

The Digital World Trends (?)

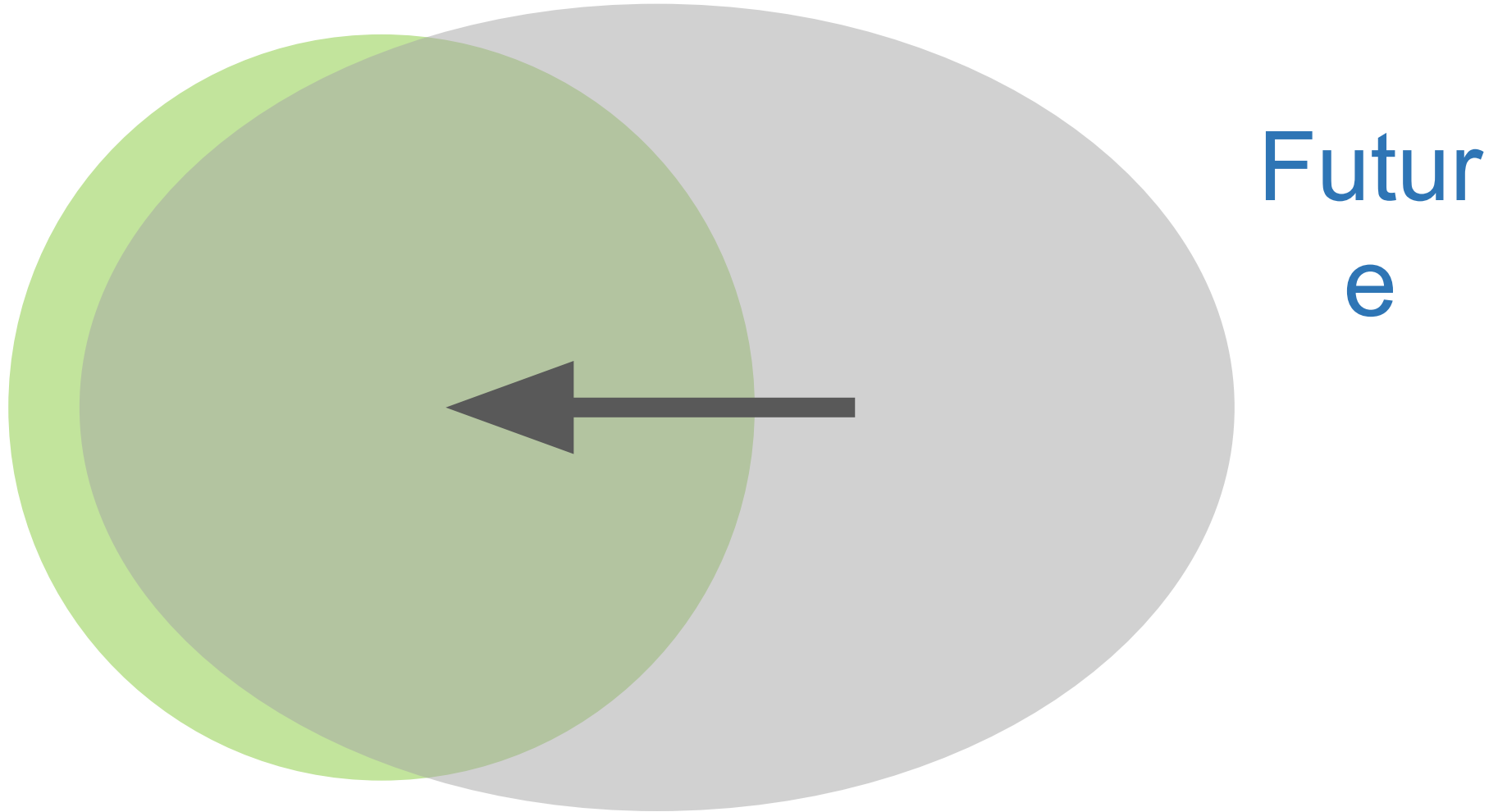
Fact
Driven Immersive
Fake Democratised
Physical Ubiquitous Connected
Intuitive Worlds
Persistent Data
Intelligent 3Dimensional

The 3D Digital World Expanding & Moving into the Physical World



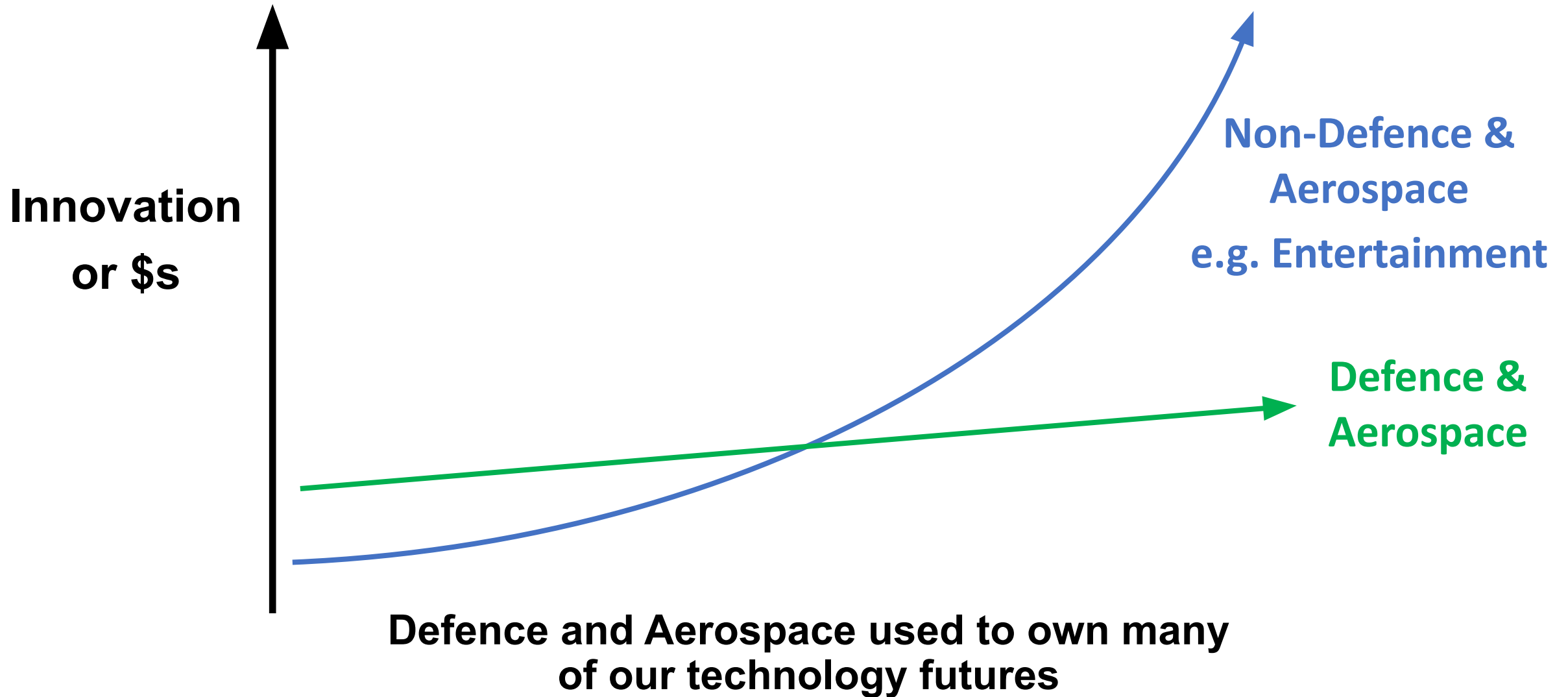
Physical & Digital Worlds

The 3D Digital World Expanding & Moving into the Physical World

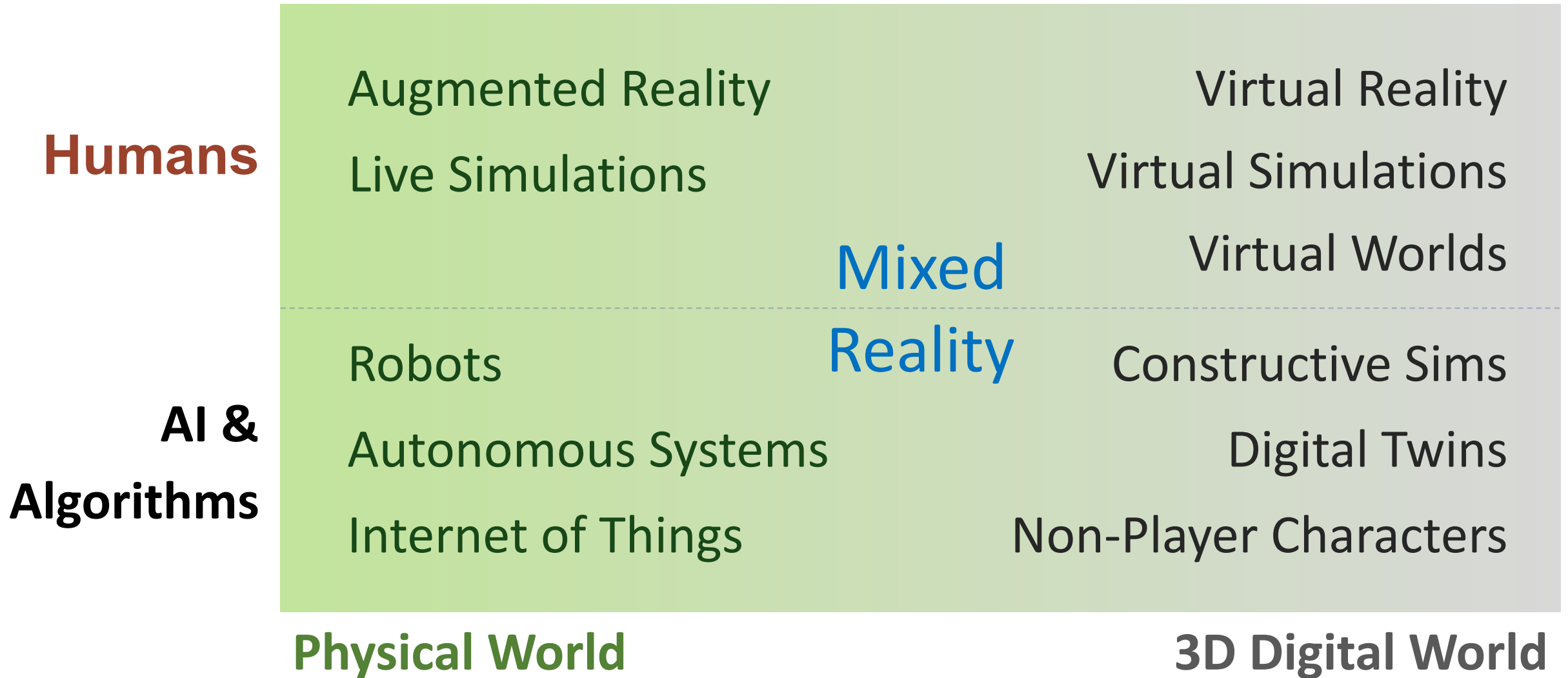


Physical & Digital Worlds

Who's Driving Metaverse Technologies?



The Metaverse in 2024 – A Unifying Concept?



The Metaverse in the Future?



**Human and AI Controlled
Systems Coexisting in Mixed
Physical and 3D Digital
Realities**

The Metaverse is Resting

- The Metaverse is resting, but its building blocks are alive and doing very well
- Whether it is called the metaverse or not, a unifying concept for the rapid advances in the interactive 3D digital technologies is valuable

Way Forward for the Enterprise

- **Build and Connect the Virtual and Physical Worlds:**

- Build a persistent connected open 3D digital enterprise-wide ecosystem supporting the digital and physical worlds.

- **Inform and Empower Workforce:**

- Continuously inform and support your workforce in XR, AI, and cutting-edge tech, and provide real-time interactive 3D digital spaces for seamless teamwork and training.

- **Optimise with Digital Twins:**

- Build and connect digital twins and simulations to enhance engineering, operations and training.

Questions?



Andy Fawkes

RAeS Flight Simulation
Conference

London | 23 October 2024
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