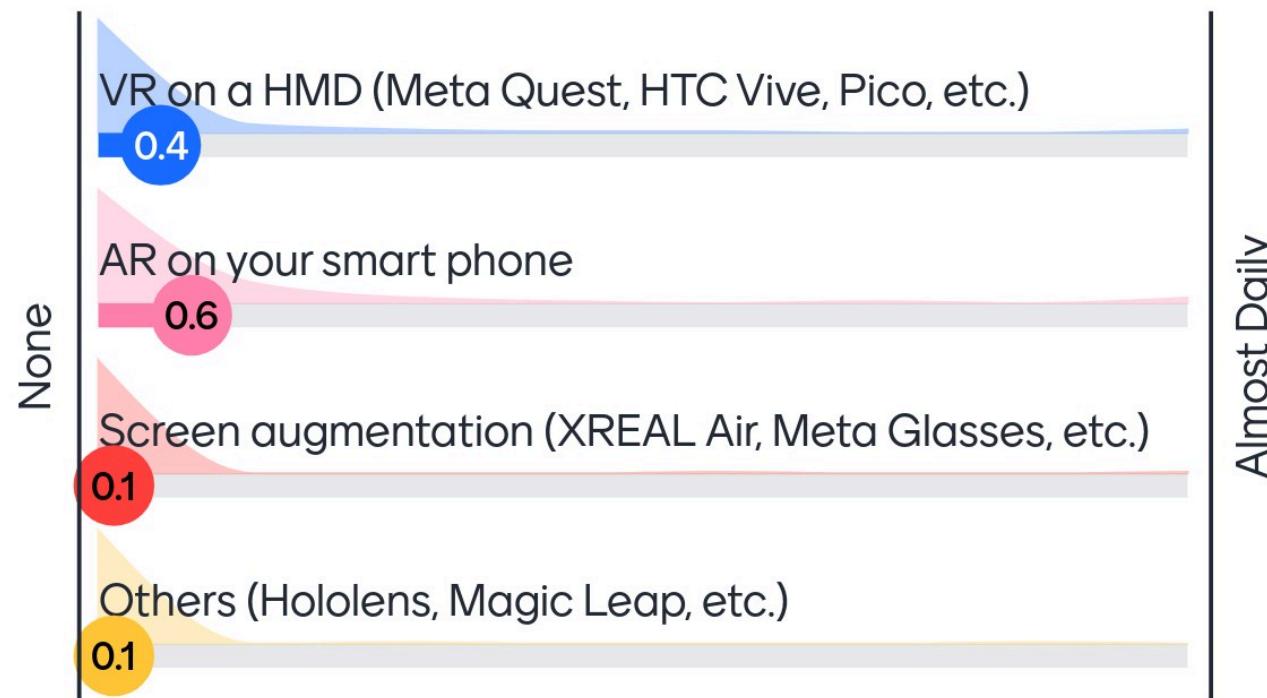


How many days a week do you use XR?



The usual mambo jambo... (see GitHub)

- learning outcomes
- assessment components
- weekly learning activities
- attendance taking

What to expect...

- this is the 2nd run, **expect changes**
- learning content is free and vast
- our role is a facilitator, and not a teacher



Changes based on feedback

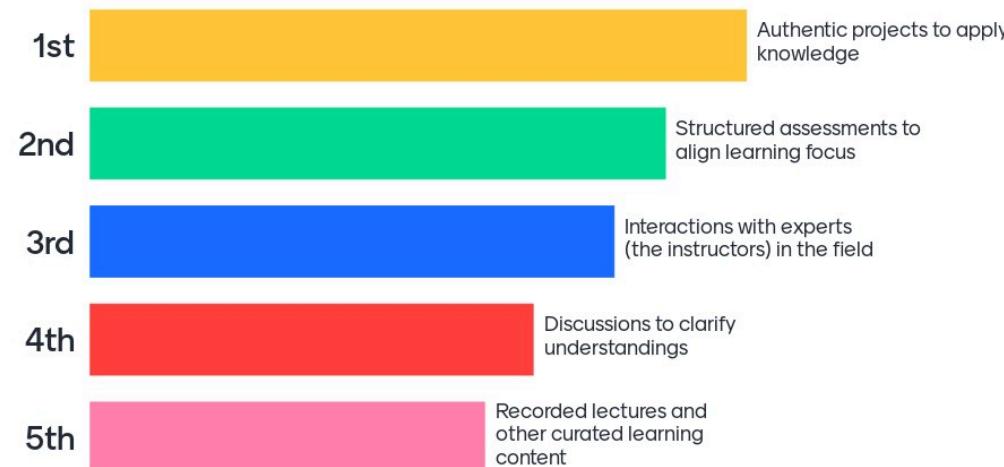
- broader project theme
- streamlined assessment load
- one platform (and no Slack :))
- GitHub classroom for managing code interactions (and no Docker)
- keep flipping (the classroom)

Who are we?

- Chek is a researcher in Immersive HCI
- Songjia is a Research Engineer in XR for learning
- Budi is a Senior Professional Officer leading the UniverseSITy dev



What do you feel will be most useful for learning in this module? Rank from the most useful to least useful element.



Some suggestions on learning strategy...

- seize the opportunity to create
- focus on translating design to code, and not focus on code
- interact with us (and others)
- find the right motivation to learn

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A note on lecture notes...

SCIENCEINSIDER | EDUCATION

Lectures aren't just boring, they're Ineffective, too, study finds

"Active learning" boosts grades, reduces failure rates in undergraduate STEM classes, concludes major review

12 MAY 2014 • BY ALESZU BAJAK



A black and white photograph showing a large lecture hall from an elevated angle. Many students are seated at their desks, facing towards the front where a teacher stands at a podium. The room appears to be a traditional lecture hall with tiered seating.

- it doesn't exist here 😱
- mixed formats of learning content, including produced by yours truly
- our videos (also podcasts) takes much longer to create than "lectures"
- all content sources linked in slack + show notes
- you can also piece together the same content, we just saved some time for you
- and then there's Copilot, ChatGPT, etc... 😅
- BUT you still have to consume the content 🍲 😊
- <https://www.science.org/content/article/lectures-arent-just-boring-theyre-ineffe>

HISTORY XR

Mentimeter



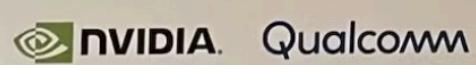
THE 21ST IEEE INTERNATIONAL SYMPOSIUM
ON MIXED AND AUGMENTED REALITY
ISMAR 2022
SINGAPORE
17-21 OCTOBER 2022



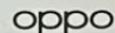
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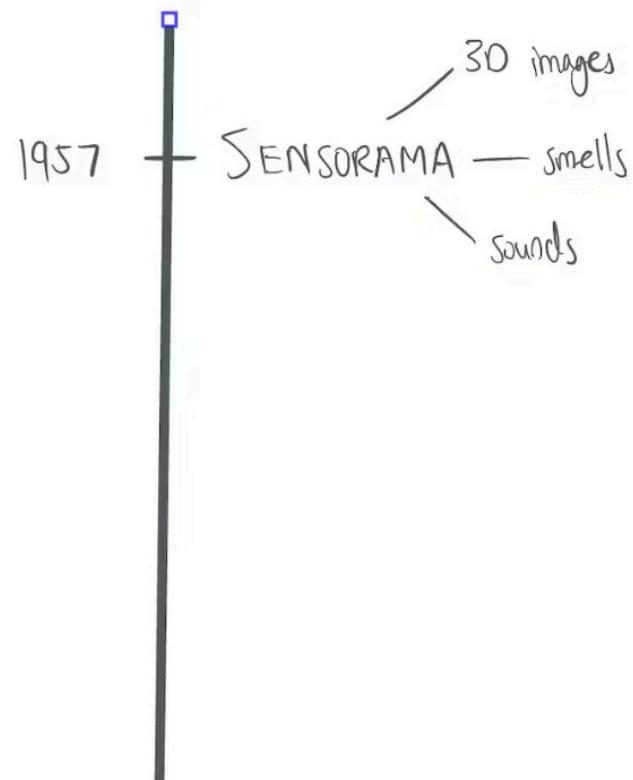
BRONZE SPONSORS



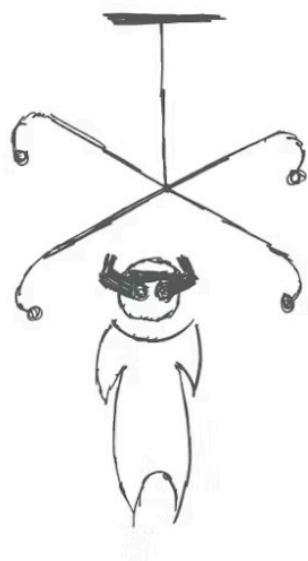
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HISTORY XR



1968 - THE SWORD OF DAMOCLES
THE FIRST HMD



1987 -

EYEPHONE + DATA GLOVE

"Virtual Reality" coined
by Jaron Lanier, VPL Research



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1991 -

VIRTUALITY 1000
by the Virtual Group

stereoscopic 3D

multiplayer

1993 -

SEGA VR
1st goggles-styled

head tracking

stereo sound

LCD screen

1994 -

SEGA VR-1
Arcade in
Segaworld

3D polygon graphics

motion simulator



1995

NINTENDO VIRTUAL BOY
1st portable stereoscopic 3D
game console



2005 → E-MAGIN Z800 3D VR
OLEO / hi-fi sound | head tracking
360° FOV



2012 → Oculus RIFT DK1
by Palmer Luckey
/ lightweight \ good Stereo 3D



Guess the price of the original Oculus DK1?

0
100

3
900

7
2000


3
300

6
1100

4
5000


6
500

4
1300

4
8000


2
700

7
1500

1
10000


2014 → GOOGLE CARDBOARD
(and FB purchased Oculus)

cheap use existing smartphones



2015 — SAMSUNG GEAR VR

2016 —
HTC VIVE
Oculus RIFT
PLAYSTATION VR
:
:



WHAT R?



VR



AR



MR

XR?

Describe briefly, what is the difference between AR and MR?

AR augments your vision with useful information. MR you mix, virtual elements together with your real vision.

AR, display virtual images in a real time location, eg: display virtual cats in your room. While Mixed Reality, display virtual in a more interactive way, eg: a virtual paint brush to paint anywhere

MR understands the real world and uses properties of it to enhance immersion. AR simply layers additional visuals over a user's already existing vision.

The M stands for Microsoft 

AR - You can see the thing stuff in the real world
MR - You can see the thing stuff in the real world but the thing stuff is aware of the properties of the real world

AR draws on top of the real world, MR allows interaction between the real world and the virtual world

Mixed Reality is more immersive

AR primarily overlays digital information onto the existing environment while MR blends the two worlds together which creates a more immersive and "real" experience for the user.

Describe briefly, what is the difference between AR and MR?

AR augments by displaying images onto real-world images. MR mixes by mixing both images and real-world environment, that allows the images to interact with the real-world

MR is able to scan for different platforms in your surroundings to properly set boundaries

AR contains real world images, MR is a combination of both real world and virtual elements

AR is not as immersive, e.g. you don't strap your phone to your eyes to play pokemon go. MR is more immersive, where you see real life + augmented reality together while being immersive

AR is just projecting a virtual image onto real life objects through a lens, MR allows for real life objects and virtual objects to interact with each other.

AR has virtual object overlaid on to real world environment while MR uses virtual environment and combines it with the real world

Augmented reality adds things to what is real, while MR integrates and interacts with the physical environment

AR = Sprites overlay. MR = real time 3D

Q All

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vs augmented



use cases



oculus



vr mr



reality augmented virtuality



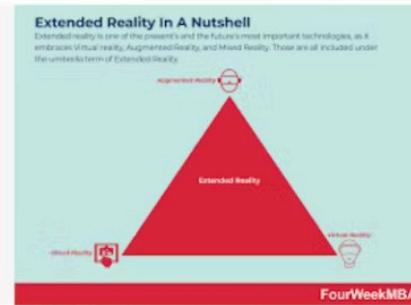
vr ar mr



virtuality continu



envision-is.com

envision-is.com/wp-content/uploads/202...

FourWeekMBA

Extended Reality: Definition, Use Cases ...



SaM Solutions

XR (Extended Reality) and Its Use Cases ...

**Virtual Reality (VR)**

VR visually takes the user out of their real world environment and into a virtual environment, typically using a headset for viewing coupled with hand-held controllers to navigate the virtual space.

**Augmented Reality (AR)**

AR visually takes the user out of their real world environment and into a virtual environment, typically using a headset for viewing coupled with hand-held controllers to navigate the virtual space.

**Extended Reality (XR)**

XR refers to the spectrum of experiences that blurs the line between the real world and the simulated world. The technology immerses the user through visuals, audio, and potentially olfactory and haptic cues. The two major types of XR are virtual reality and augmented reality.

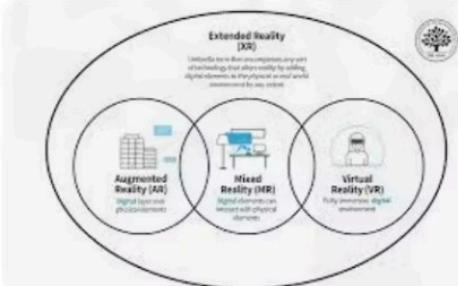
Accenture

The wonders of Extended Reality ...



XR PEDAGOGY

XR PEDAGOGY - What is XR?



Interaction Design Foundation

What is Extended Reality (XR)? | IxDF



Sensorium

What Is Extended Reality - XR Explained



Government Accountability Office

Extended Reality Technologies ...



Immersive Media

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So what is XR again?

- means to communicate
- convergence of consumer devices
- BUT there is much more to immersive experiences...

New Technique Could Enhance Films for Visually Impaired

News Published: November 2, 2021 | [Original story from the University of York](#)



The Immersive Audio Dome at the University of York Audiolab is key to developing the 3D audio strategy. Credit: University of York/Department of Theatre, Film, Television and Interactive Media



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Immersification – a fresh dimension to learning design

Many online courses can benefit from immersive technologies to enhance student learning experiences. Here Chek Tien Tan and May Lim outline their innovative method for ensuring that the technology chosen supports the desired learning outcomes

[Edtech](#)[Course design and delivery](#)[Asia](#)[Feature article](#)**Chek Tien Tan, May Lim**

Singapore Institute of Technology

🕒 23 Dec 2020

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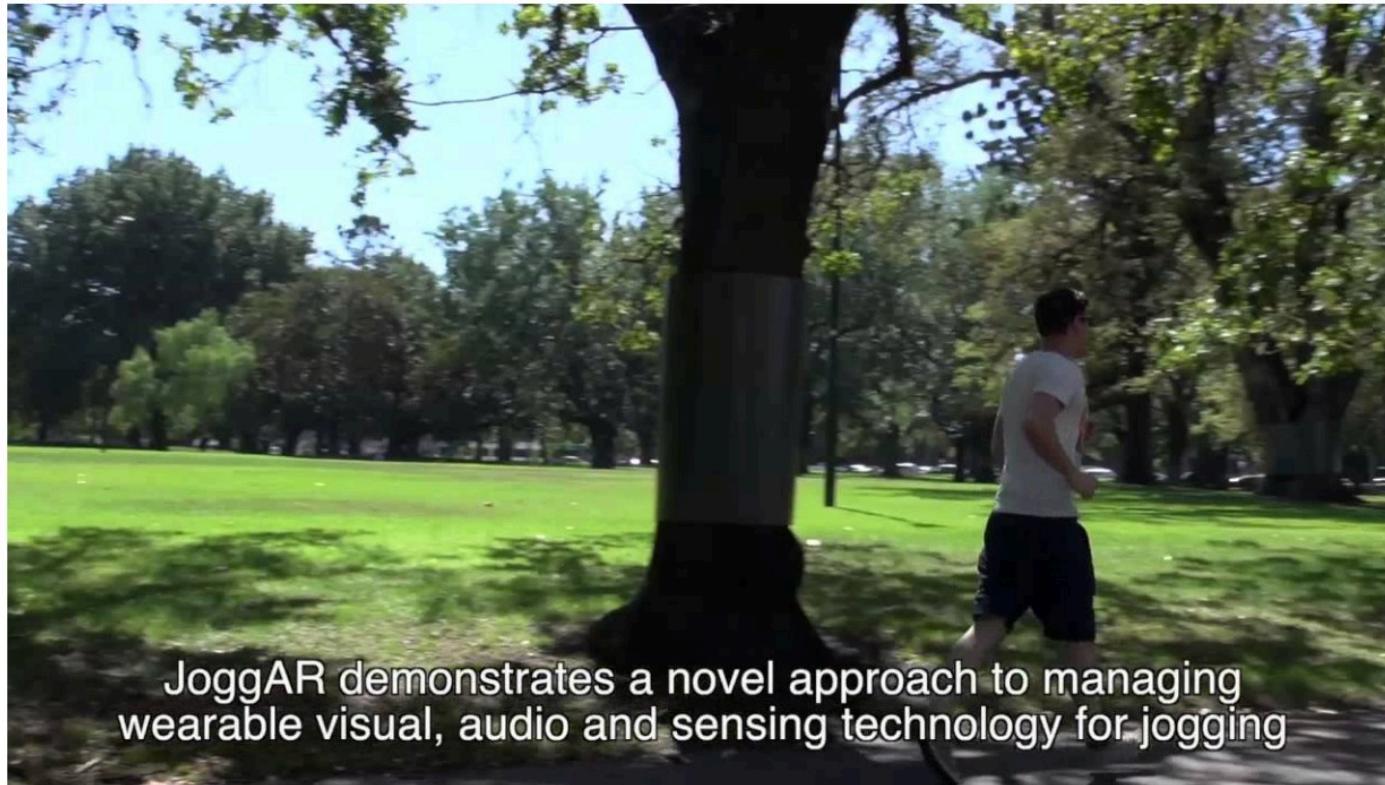


Help us improve by sharing



Different requirements ↴ different implementations

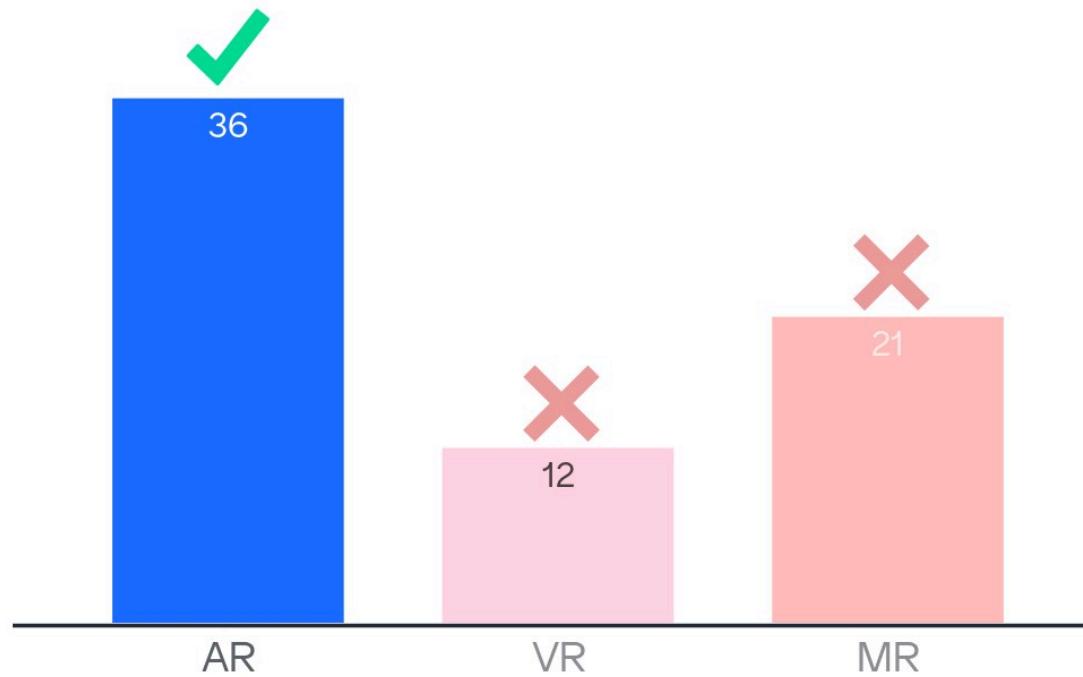




What experience is this?



What type of experience is this?



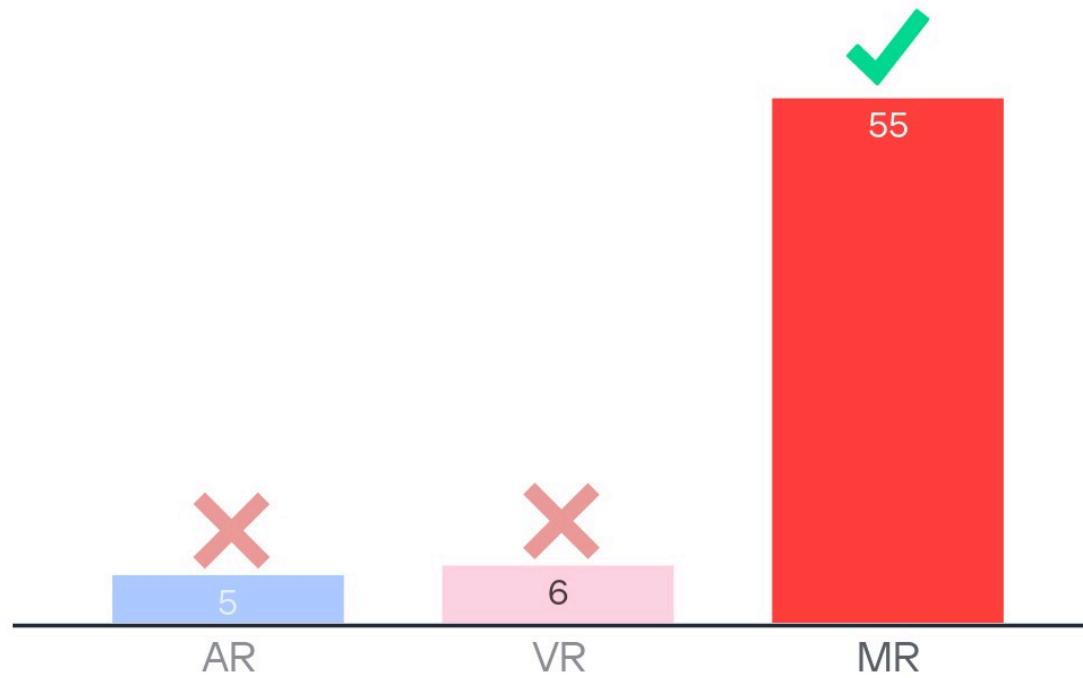
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 **Mentimeter**

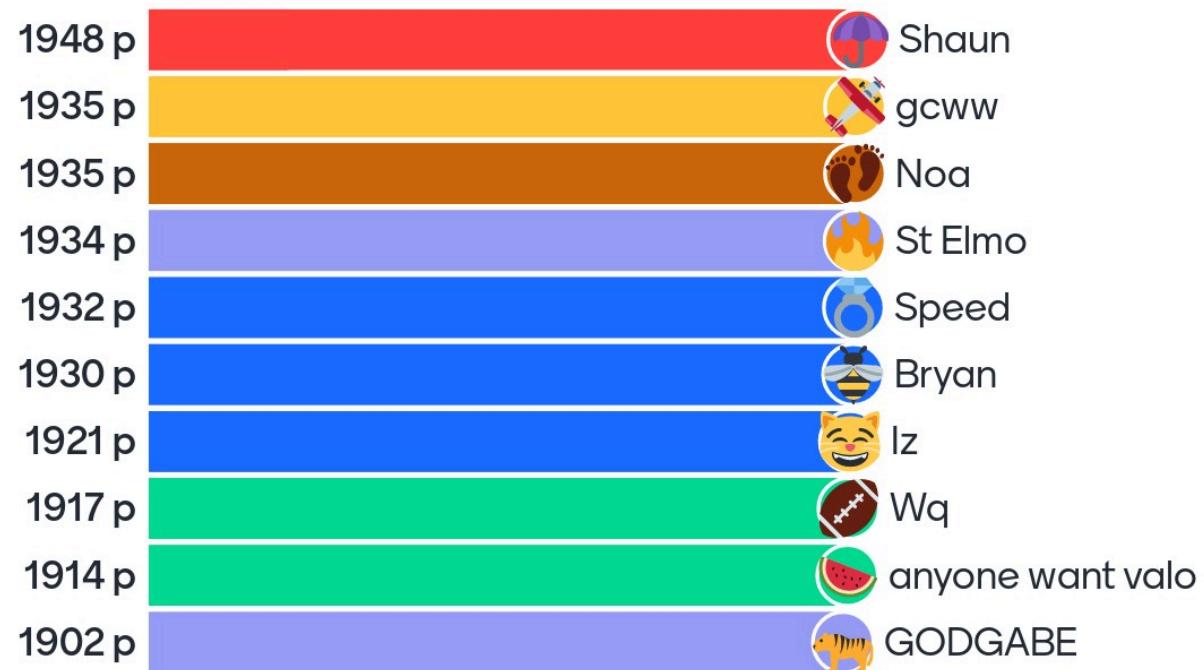


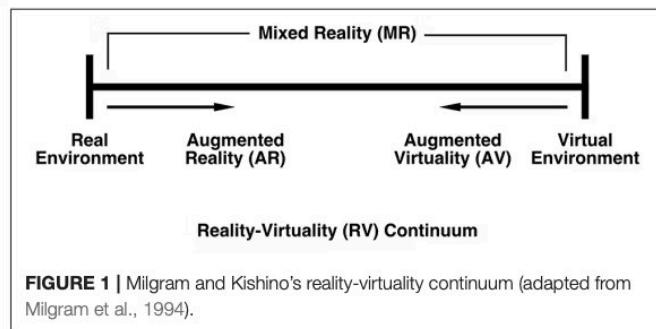
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What type of experience is this?



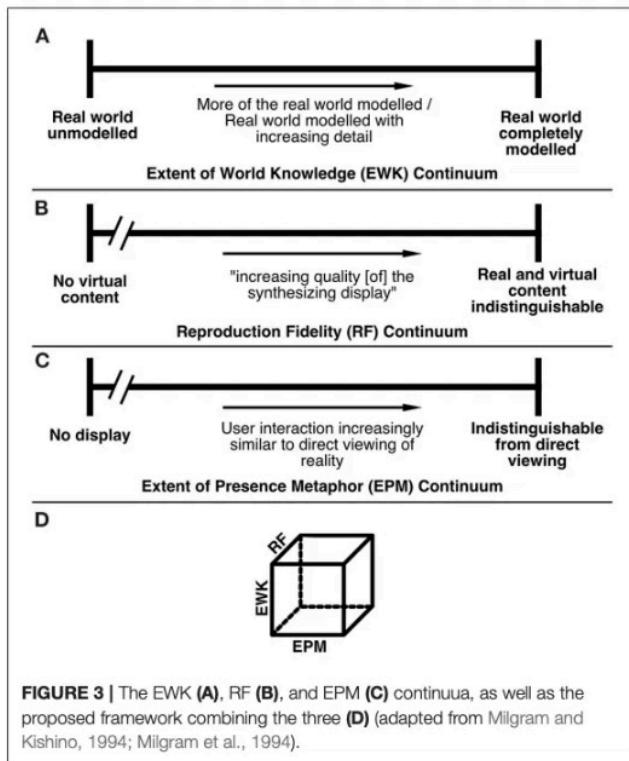
Leaderboard





Milgram-Kishino's RV Continuum

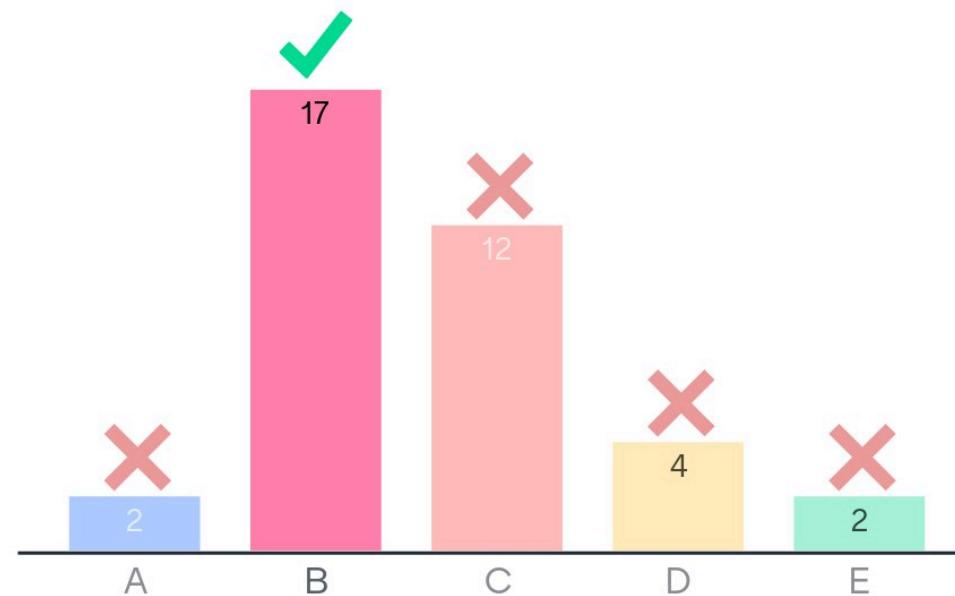
- not the immersification continuum...
- originally meant for display technologies
- <https://doi.org/10.1117/12.197321>



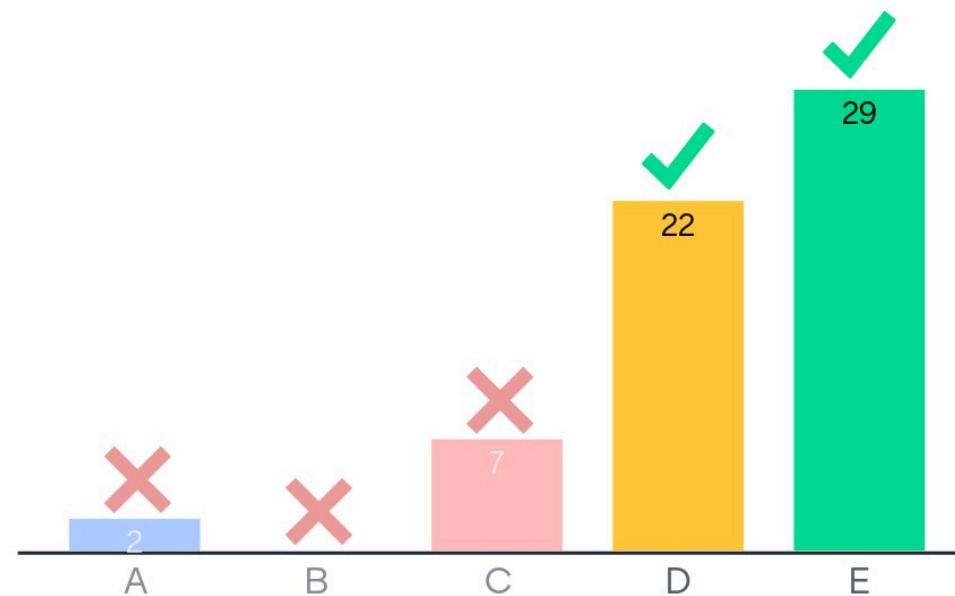
Dimensions of RV Continuum

- EWK is how much system understands the real world
- RF is how realistic the assets are
- EPM is how interaction affords realism
- <https://doi.org/10.1111/12.197321>

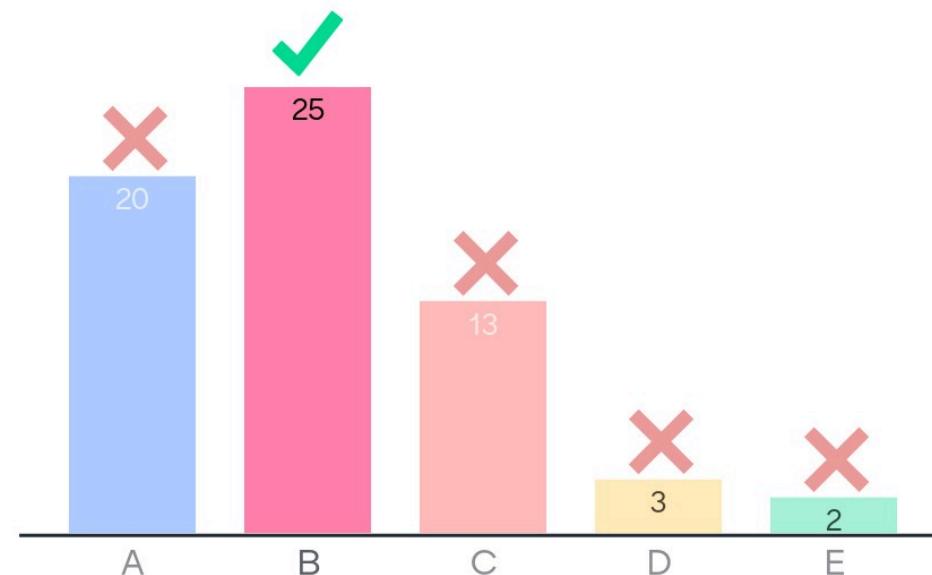
Where should Pokemon GO be placed on the RV Continuum?



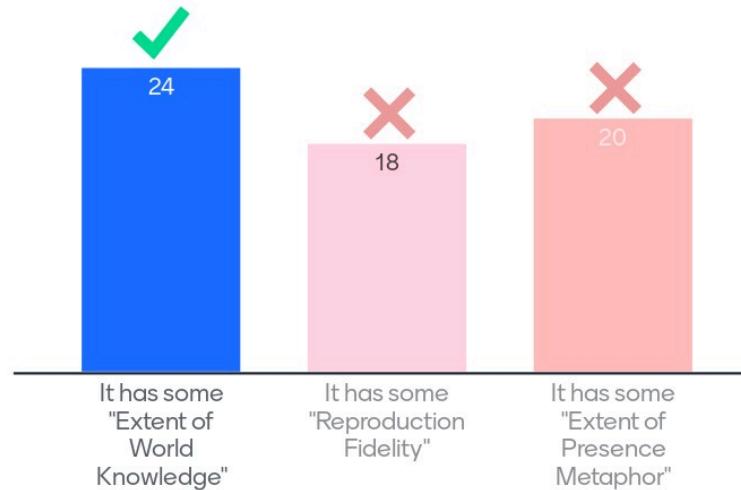
Where should Beat Saber be placed on the RV Continuum?



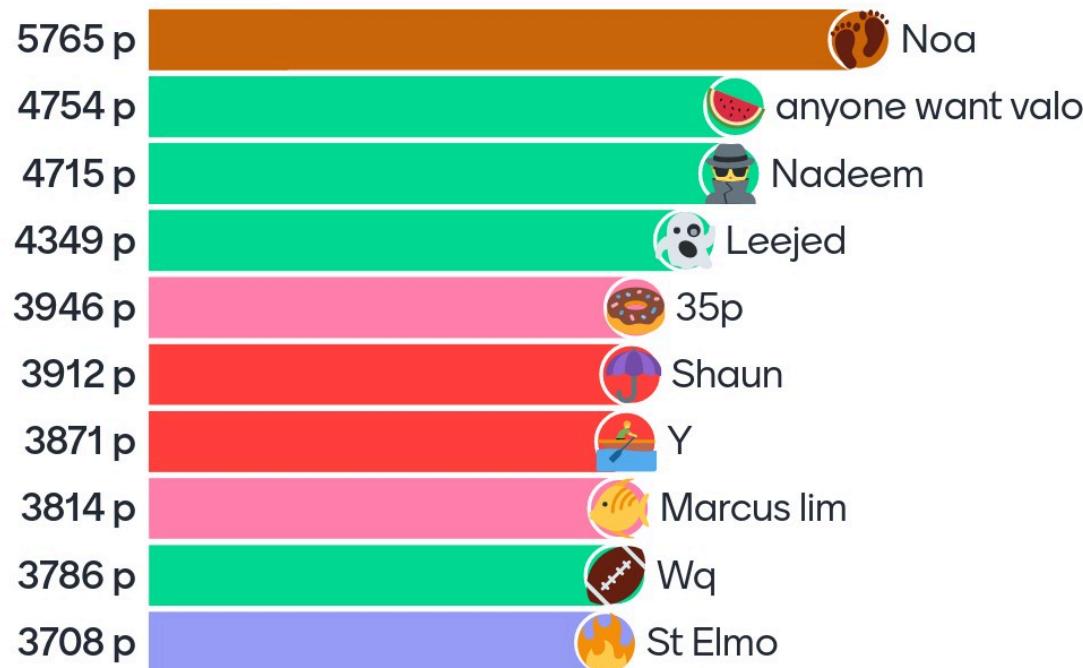
Where should Strava be placed on the RV Continuum?

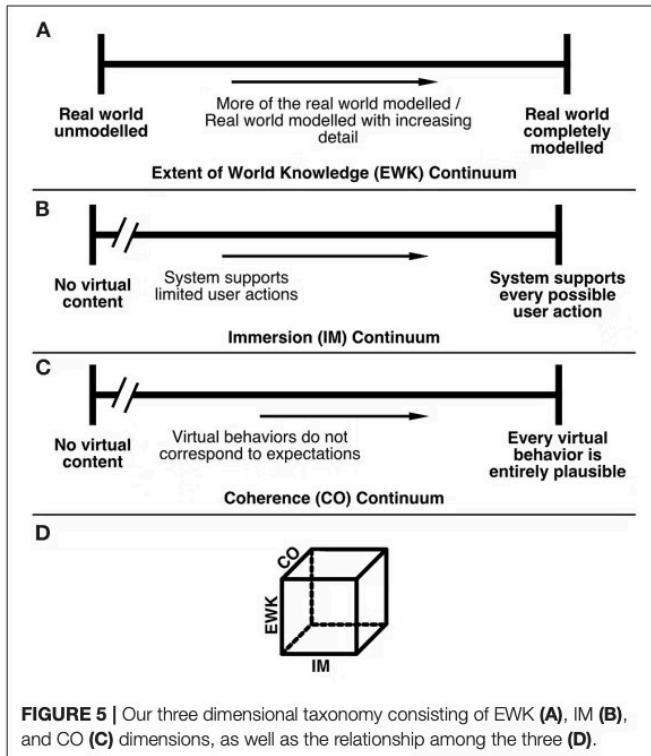


Why is Strava not considered to be near the "Real Environment" end of the RV spectrum?



Leaderboard

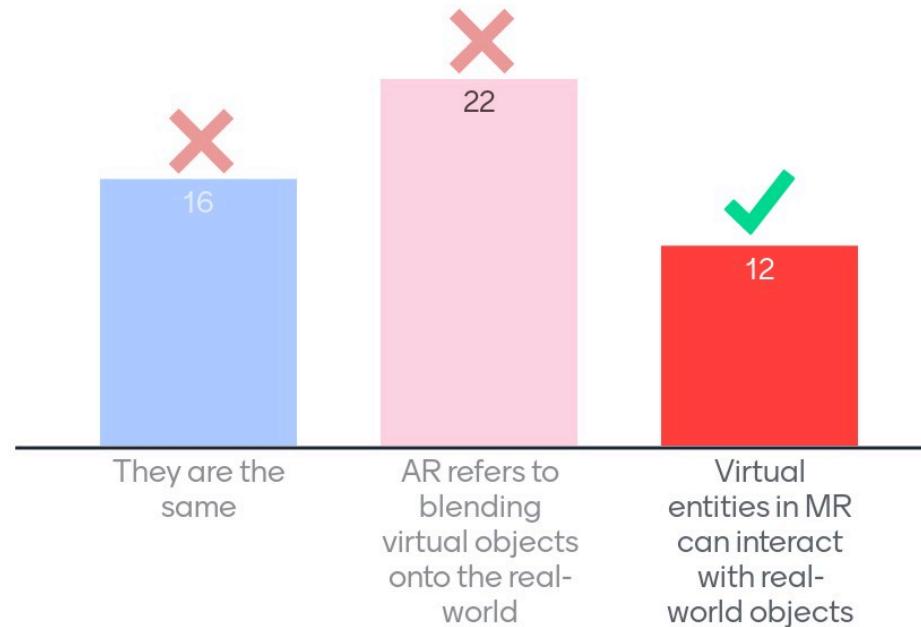




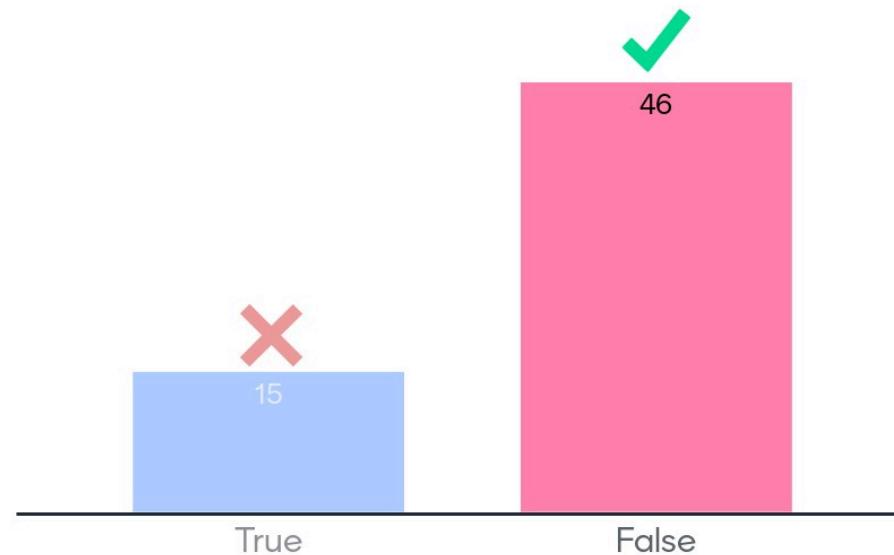
Revisiting the RV Continuum

- combined the RF and EPM into IM (our THE article came before this)
- added CO to represent the user
- note that this but one academic paper
- common perception of MR is different
- <https://doi.org/10.3389/frvir.2021.647997>

What is the common public perception of the difference between AR and MR?



VR was invented in the 21st Century (2001 - 2100)



Leaderboard



Ask me anything

11 questions
10 upvotes

Which device sparked the current (21st Century) rise of VR?



The 3D models are extremely high quality.
What dimension of the RV continuum is this referring to?



The 3D virtual dogs are able to jump onto the real table seen through the camera. What dimension of the RV continuum is this referring to?



The stereo optics provide a perception of depth through an LCD display. What dimension of the RV continuum is this referring to?



For a moment I believed that I was actually 1000ft above ground. What dimension of the RV continuum is this referring to?



Leaderboard

