Dr. Mikhail Fominykh

NTNU
IMTEL – Innovative Immersive Technologies for Learning

WEKIT ECS
Holographic training company

Training in the real world with Augmented Reality

Augmented Reality

= combining
a digital layer
and the real world

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human perception
sensory input

Illustration:
https://elizborbay.wordpress.com/2017/05/14/augmented-reality-how-we-can-use-it-in-language-learning/

AR today

https://mbryonic.com/portfolio/ar-filters-facebook/

Photo from http://amturing.acm.org/

Past

htc
Past

(CAUDELL & MIZELL, 1992)

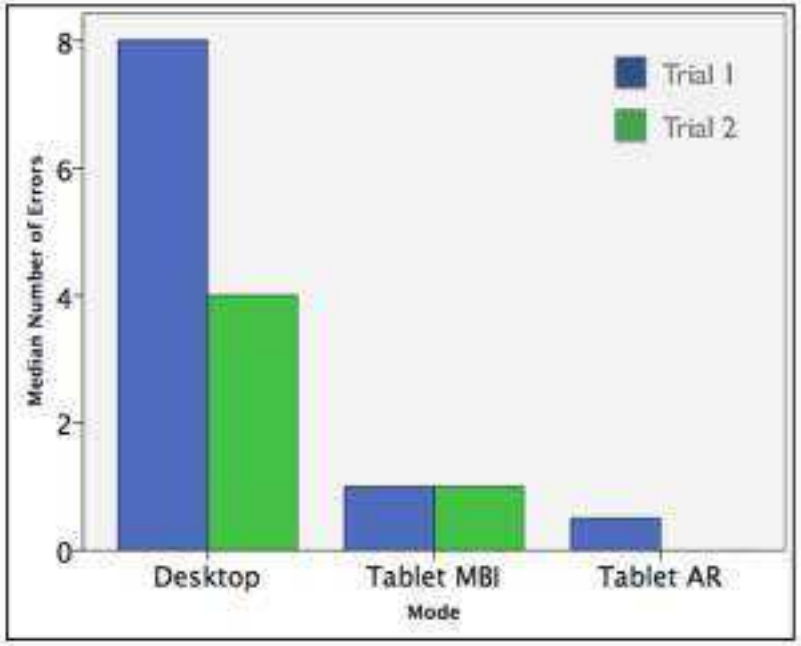
BOEING first use the term

AR

in the beginning of 90s

Supporting Industry Operations

The use of Augmented Reality when performing a 46-step task ranging in complexity from selecting the correct parts, to properly aligning and fastening bolts through multiple parts reduced time to task completion by 30% and reduced errors (first time quality results improved 90%).



RICHARDSON ET AL. (2014)
http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1090&context=imse_conf

Augmented Reality: Spatial mapping

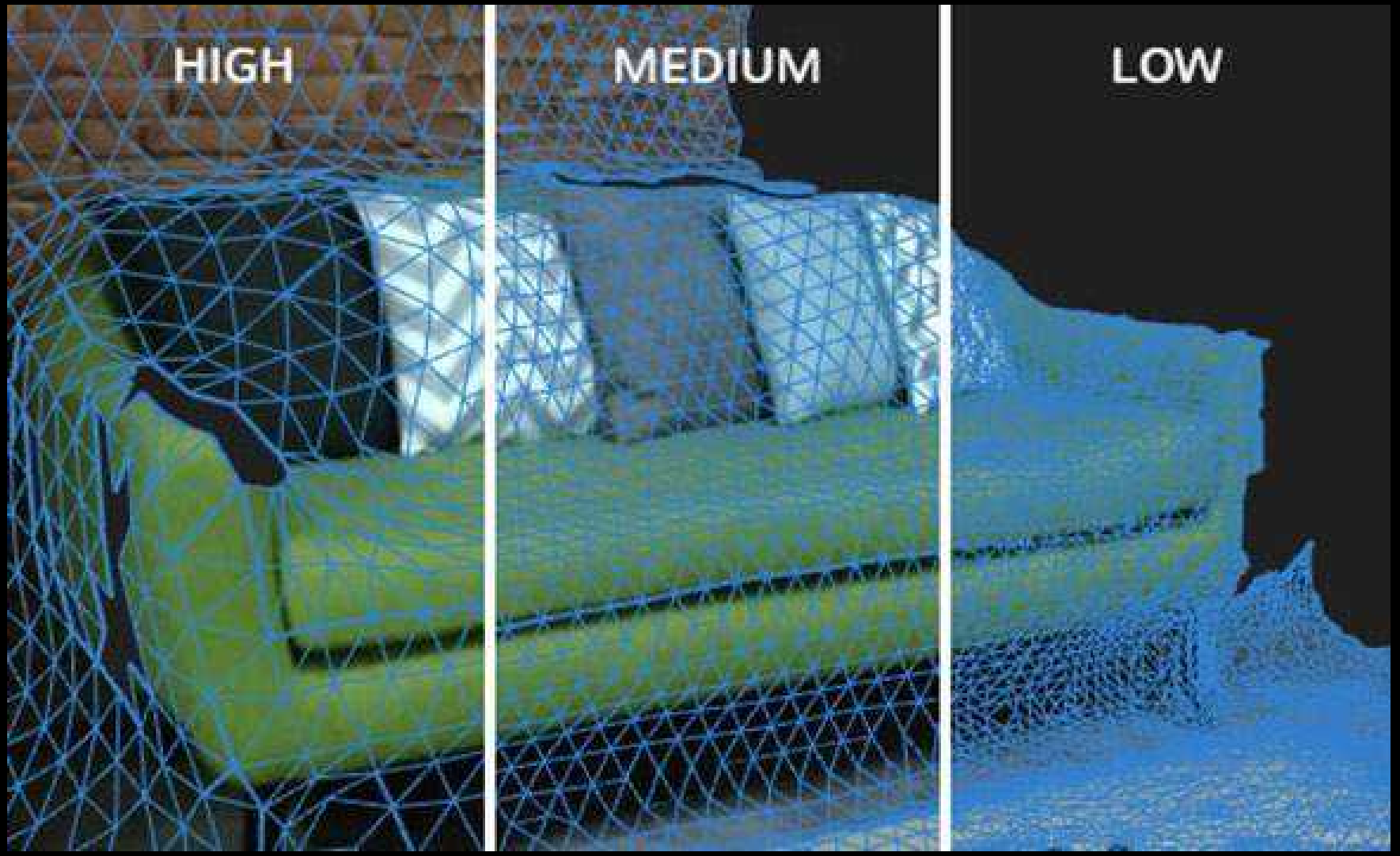


Illustration https://www.stereolabs.com/docs/spatial-mapping/

HoloLens 2

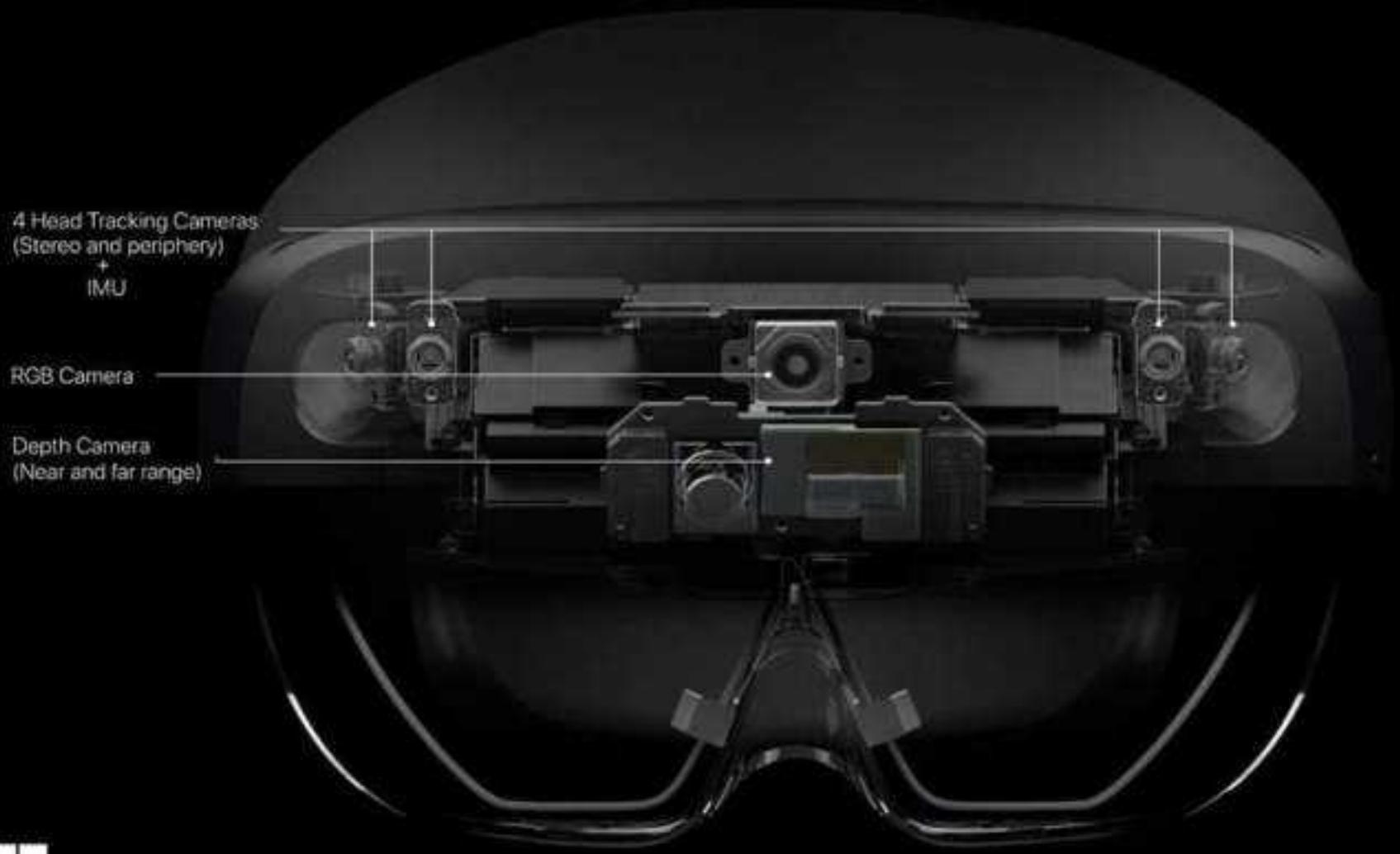


Illustration https://docs.microsoft.com/en-us/hololens/hololens2-hardware

iPad lidar

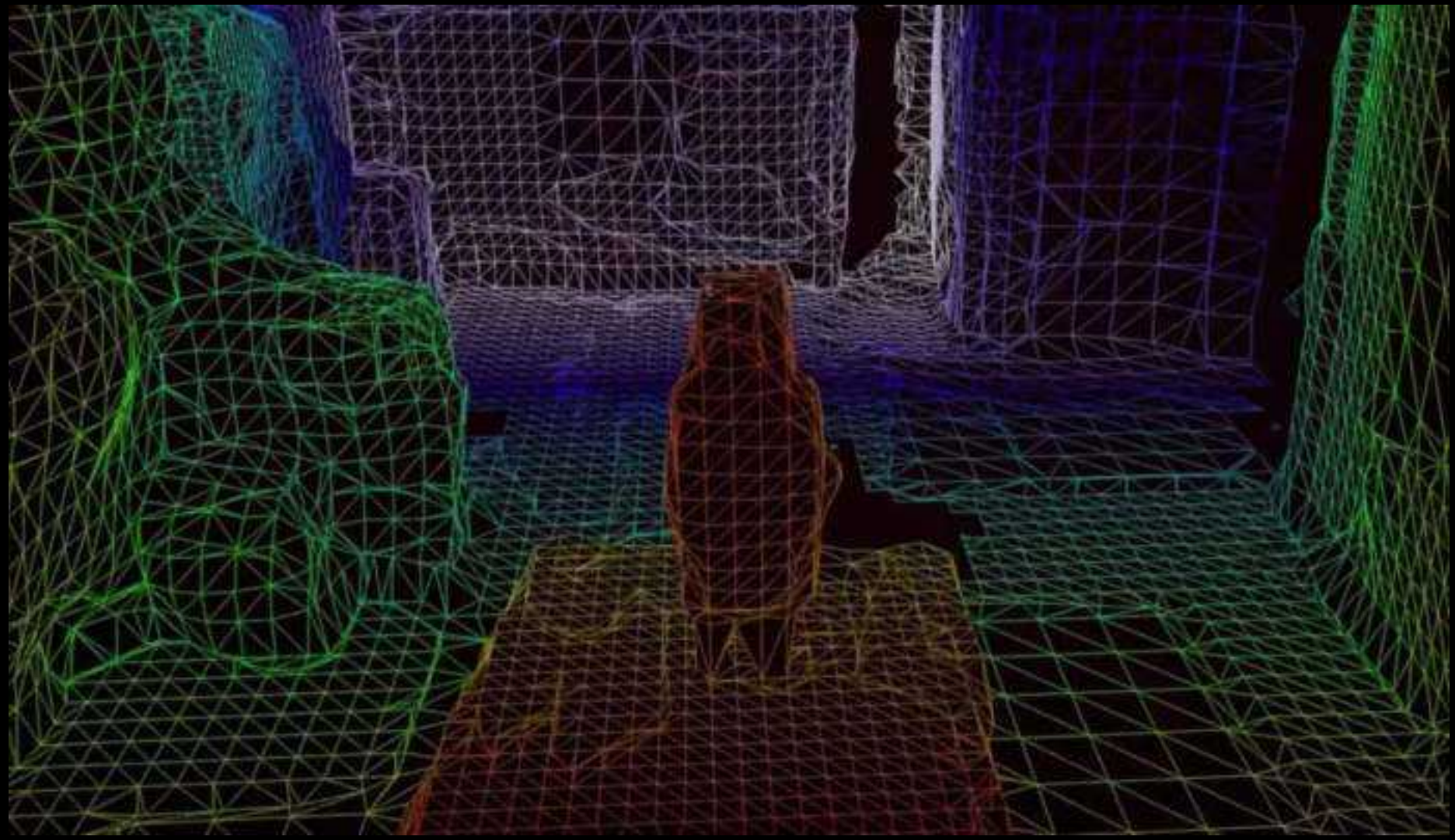
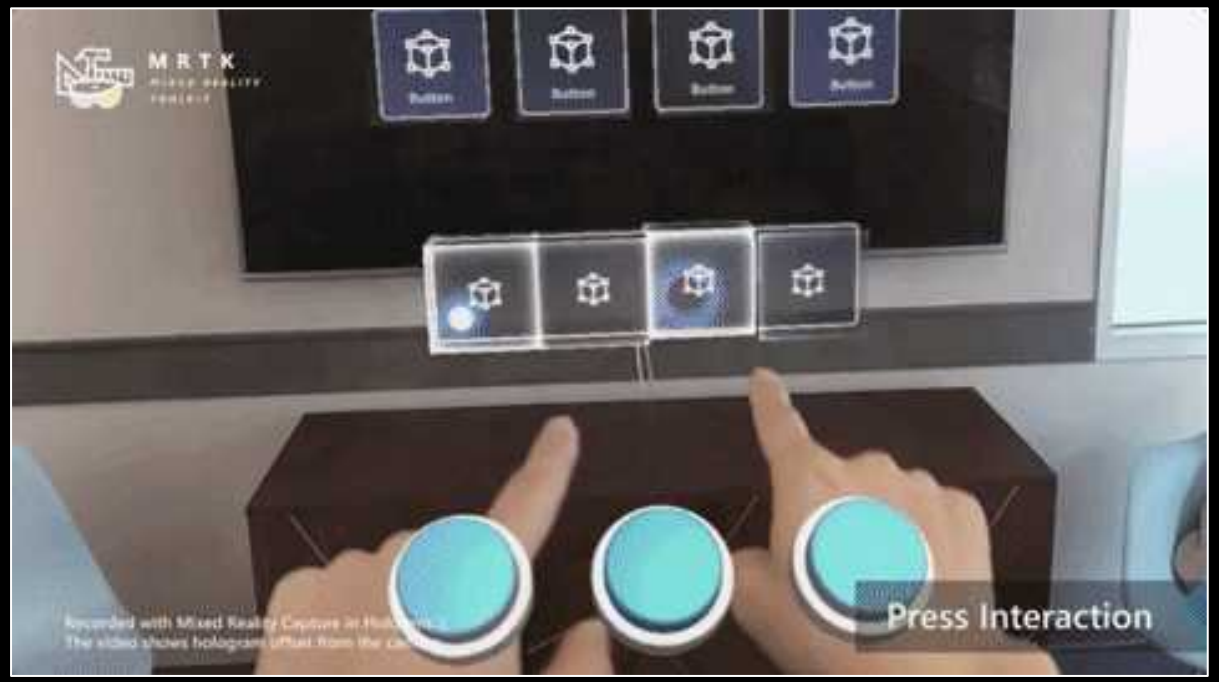
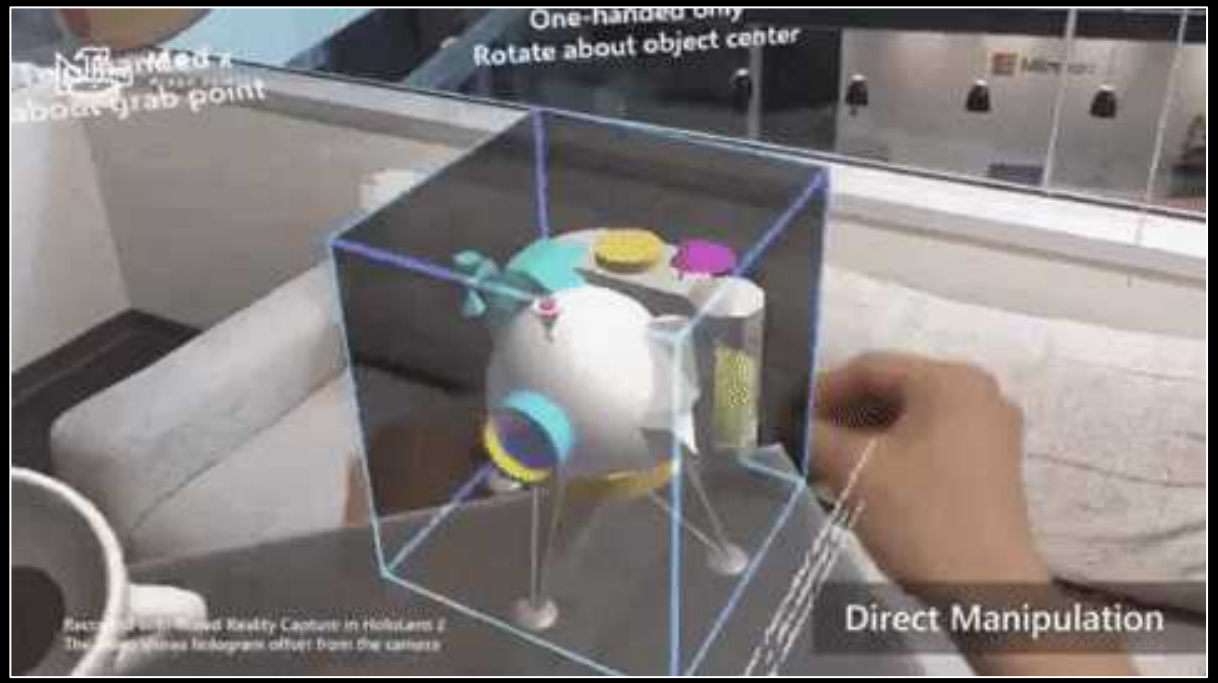


Illustration https://www.geoweeknews.com/news/ipad-lidar-demos-and-teardowns-give-a-peek-at-its-potential-and-limitations





https://hololens.reality.news/news/magic-microsofts-hololens-2-hand-interaction-display-mixed-reality-toolkit-v2-demo-video-0195899/

Logistics

https://youtu.be/gnUK-HTn4ZA?t=41s

Maintenance

https://youtu.be/VGtCQWROytw?t=39s

Energy

https://youtu.be/lkH88TTgt6A?t=1m20s

Collaboration

Remote assistance

https://www.youtube.com/watch?v=Z5DVsF1EVS8

MirageXR

Training in the real world with Augmented Reality

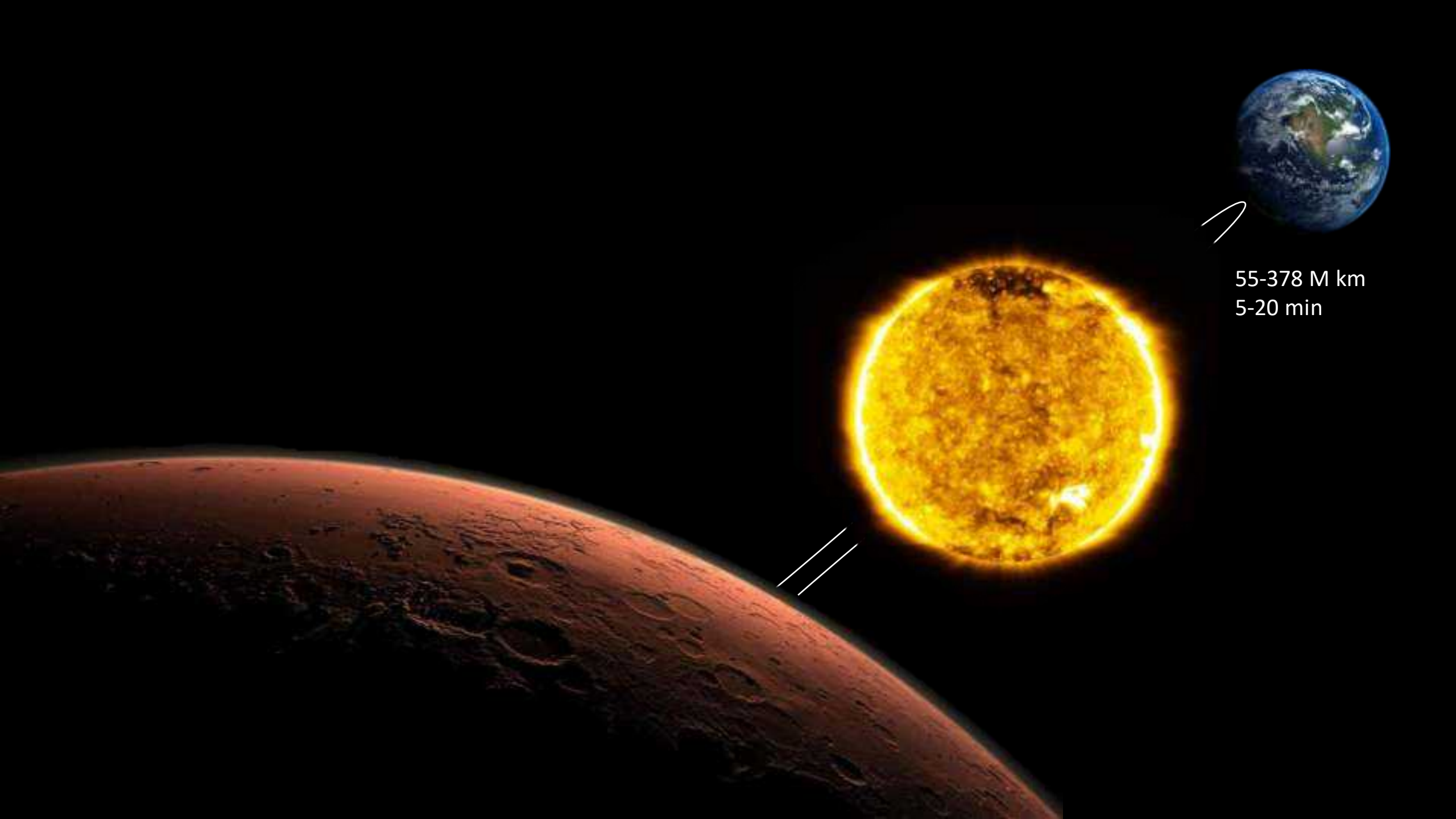
Inspired by
Ghosts in the machine by Fridolin Wild, WEKIT ECS

let’s go for a walk

… on Mars ☺

wait a
MINUTE …

and another…


55-378 M km
5-20 min

Demi-sync

/ˈdɛmisɪŋk/

1. half live;

2. ‘almost’ occurring at the same time.

- No real live (ground) support
- Built for independence and autonomy
- Captured, but using AI to adapt to local characteristics and events during delivery

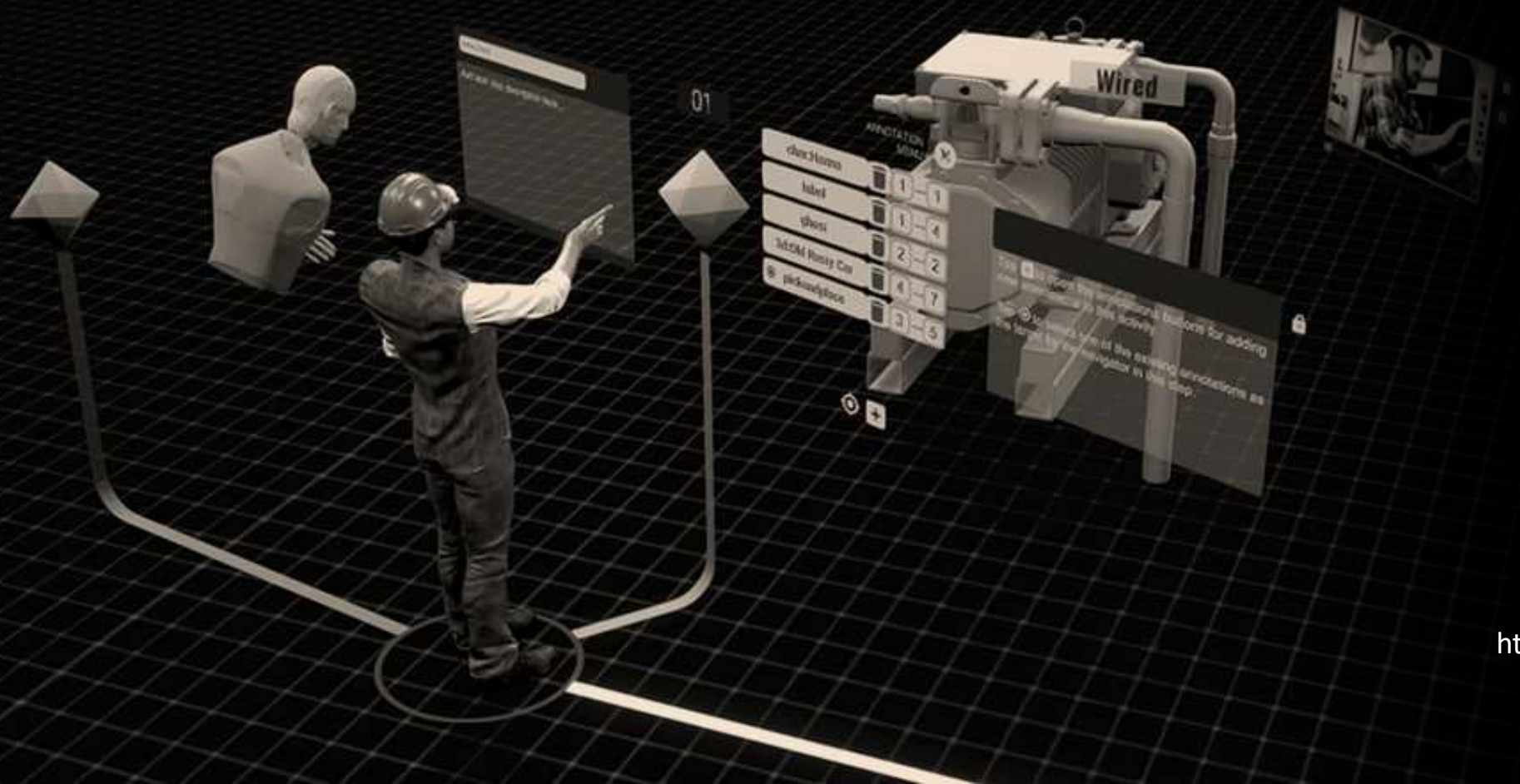
what does it look like?

WEKIT ECS
GHOSTTRACK REPLAY
Ghost on Mars

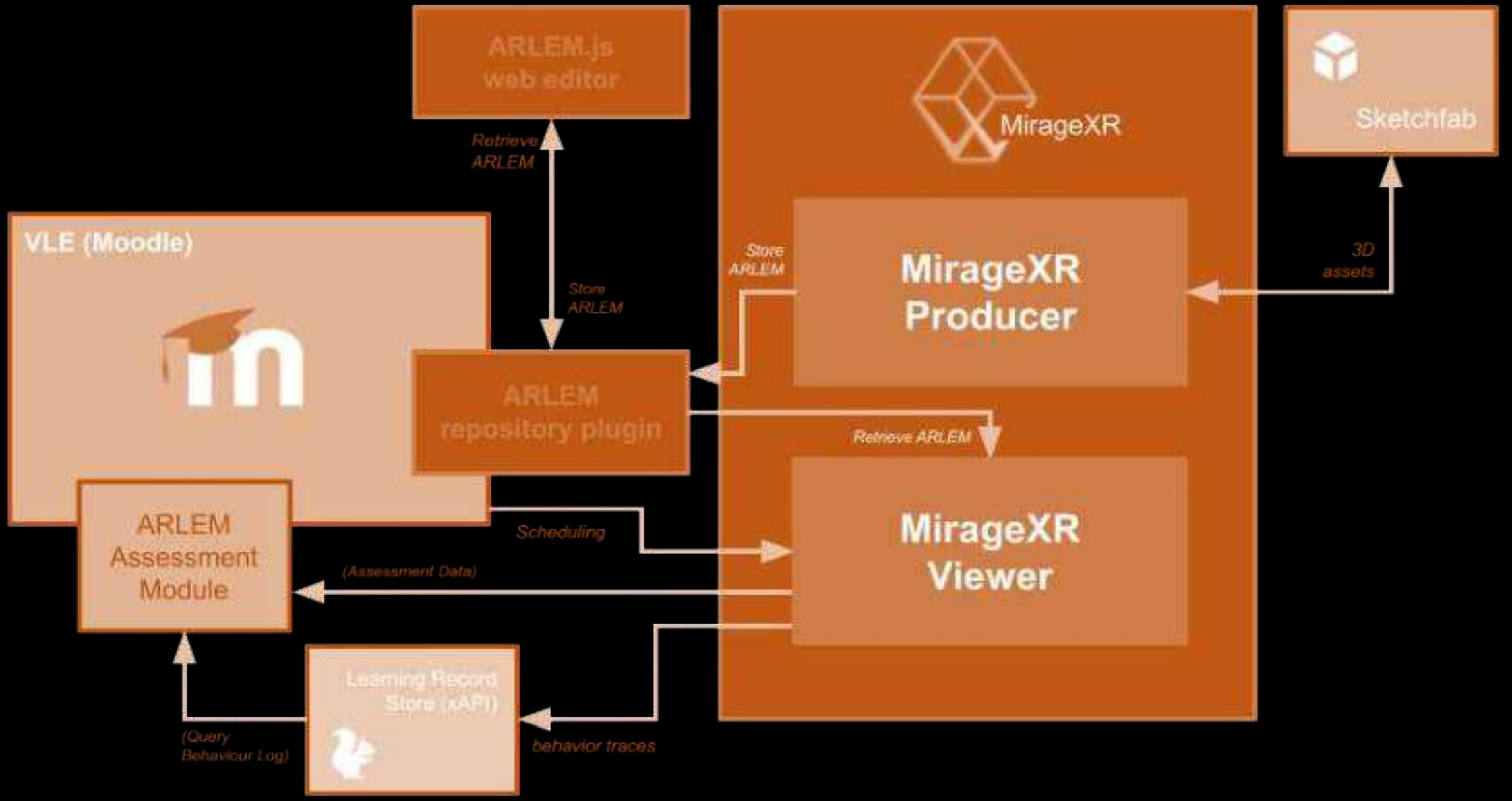
how does it work?

Reality as a platform

https://github.com/WEKIT-ECS/MIRAGE-XR/



https://sagroups.ieee.org/1589/


ARLEM.js
web editor
Retrieve
ARLEM
Store
ARLEM
VLE (Moodle)
ARLEM
repository plugin
ARLEM
Assessment
Module
Scheduling
(Assessment Data)
Learning Record
Store (xAPI)
(Query
Behaviour Log)
behavior traces
MirageXR
Store
ARLEM
MirageXR
Producer
Retrieve ARLEM
MirageXR
Viewer
Sketchfab
3D
assets

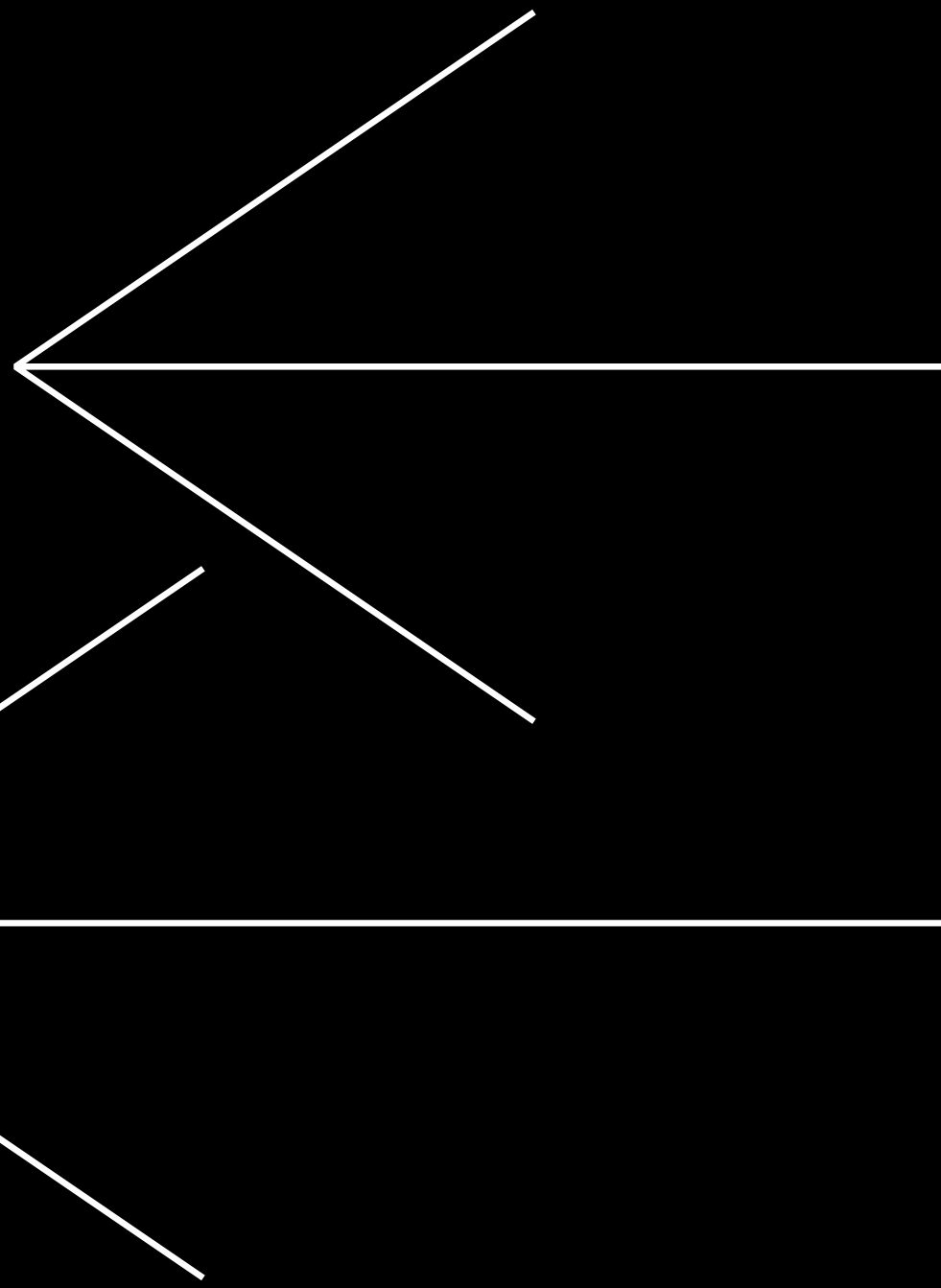
GhostTrack Replay

impact?

memorable
experience

Heightened **engagement**
and interaction satisfaction.

Platform approach
reduces costs, increases
speed, while empowering
horizontal services.

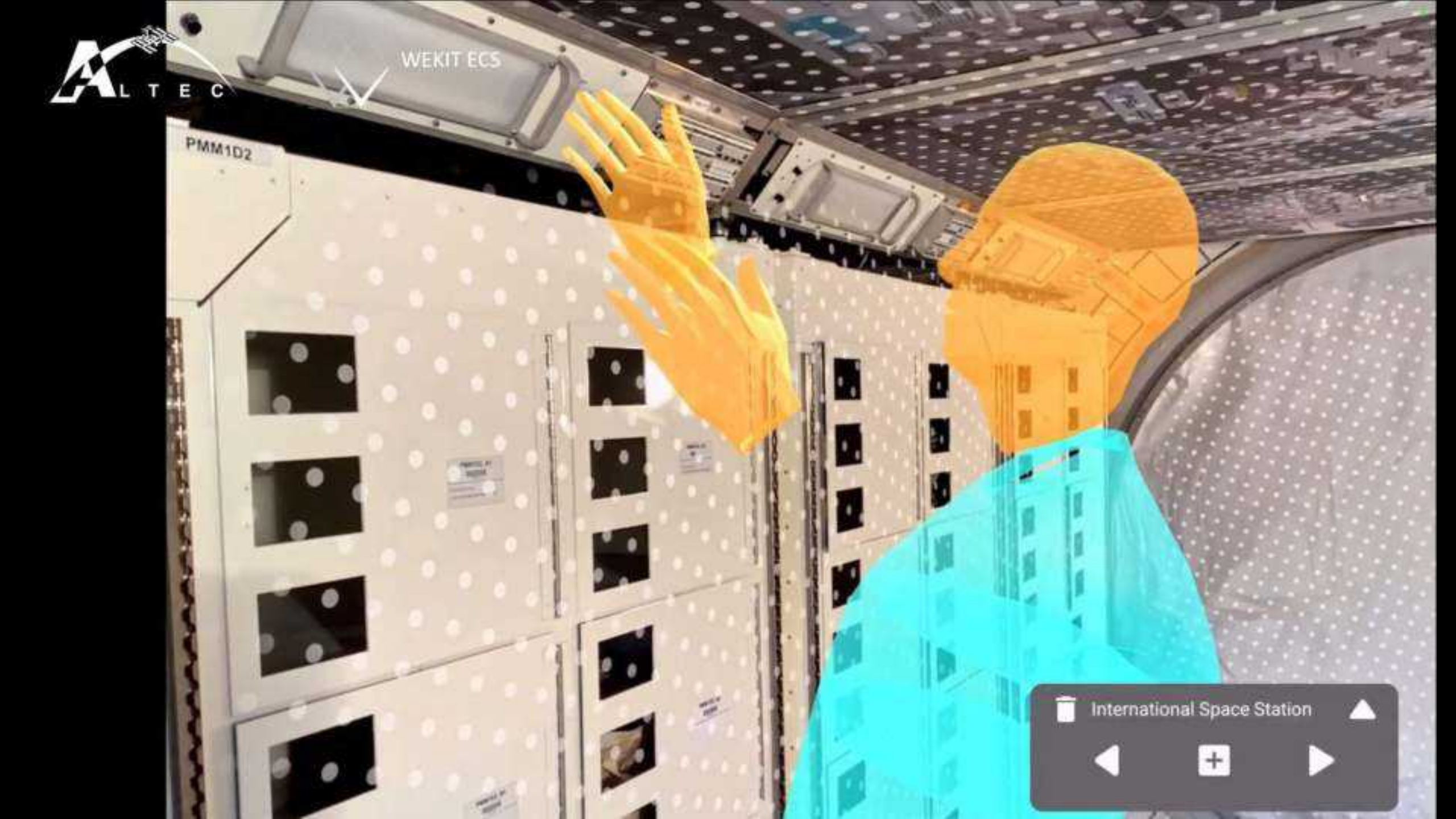


a far-fetched scenario?

-9h
-5h
+6h
+8h
Jason Smith
Kiana Sung-Hyun...

the future

Is this really
hybrid?


ALTEC
WEKIT ECS
PMM1D2
International Space Station

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