Virtual Reality (VR)

An introduction to VR interfaces
with a perspective on cross-media

Linnéuniversitetet

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4ME306-VT19
Cross-Media Design and Production

Today

- Virtual Reality (VR)
- VR technologies
- Interaction in VR
- VR and Cross-Media
- VRxAR Labs

virtual reality

definition according to LaValle (2016):

*"Inducing **targeted behavior** in an **organism** by using **artificial sensory stimulation**, while the organism has little or no **awareness** of the interference."*

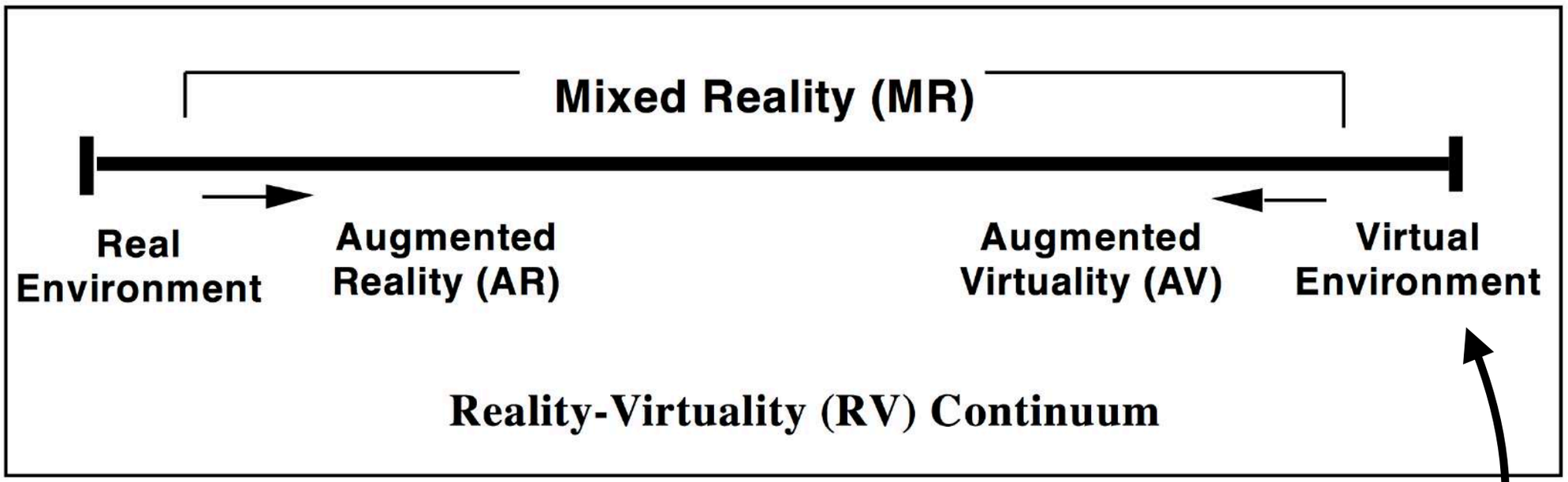
Steven M. LaValle. 2016. Virtual Reality. Online. http://vr.cs.uiuc.edu

sense	**interface**
sight	visual interfaces
hearing	auditory interfaces
touch	haptic interface
smell	scent (olfactory) interfaces
taste	flavour (gustatory) interfaces

"more or less" established

new frontiers

Steven M. LaValle. 2016. Virtual Reality. Online. http://vr.cs.uiuc.edu

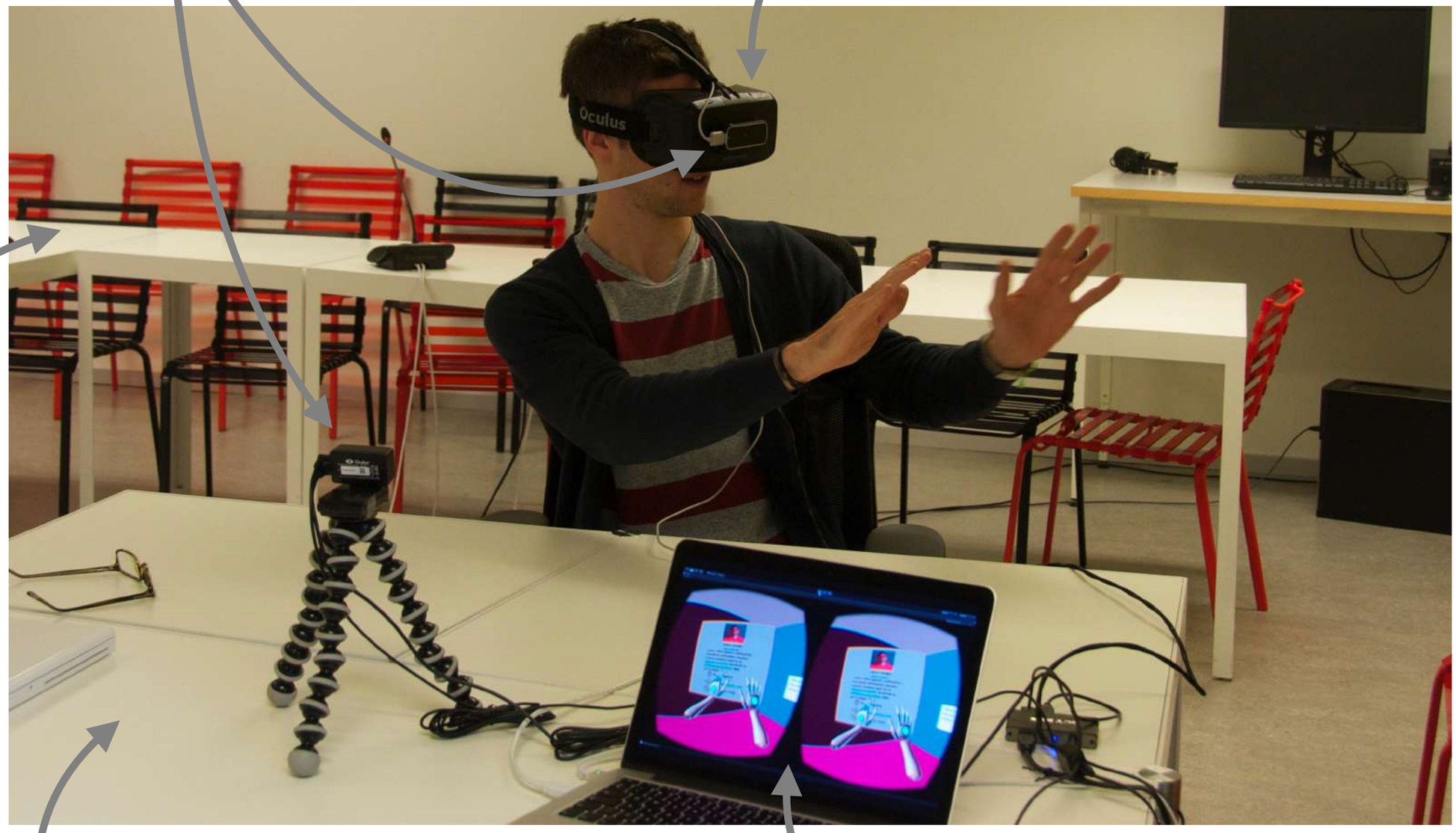


Virtual Reality

P. Milgram, H. Takemura, A. Utsumi, and F. Kishino. 1994. Augmented Reality: A class of displays on the reality-virtuality continuum. In Proceedings of Telemanipulator and Telepresence Technologies. pp. 2351–34.

tracking sensors

head-mounted display
(HMD; “VR headset”)



physical real-world space

computer-generated, virtual
three-dimensional (3D) environment

Immersion

"Immersion refers to the objective level of sensory fidelity a VR system provides."

Presence

"Presence refers to a user's subjective psychological response to a VR system."

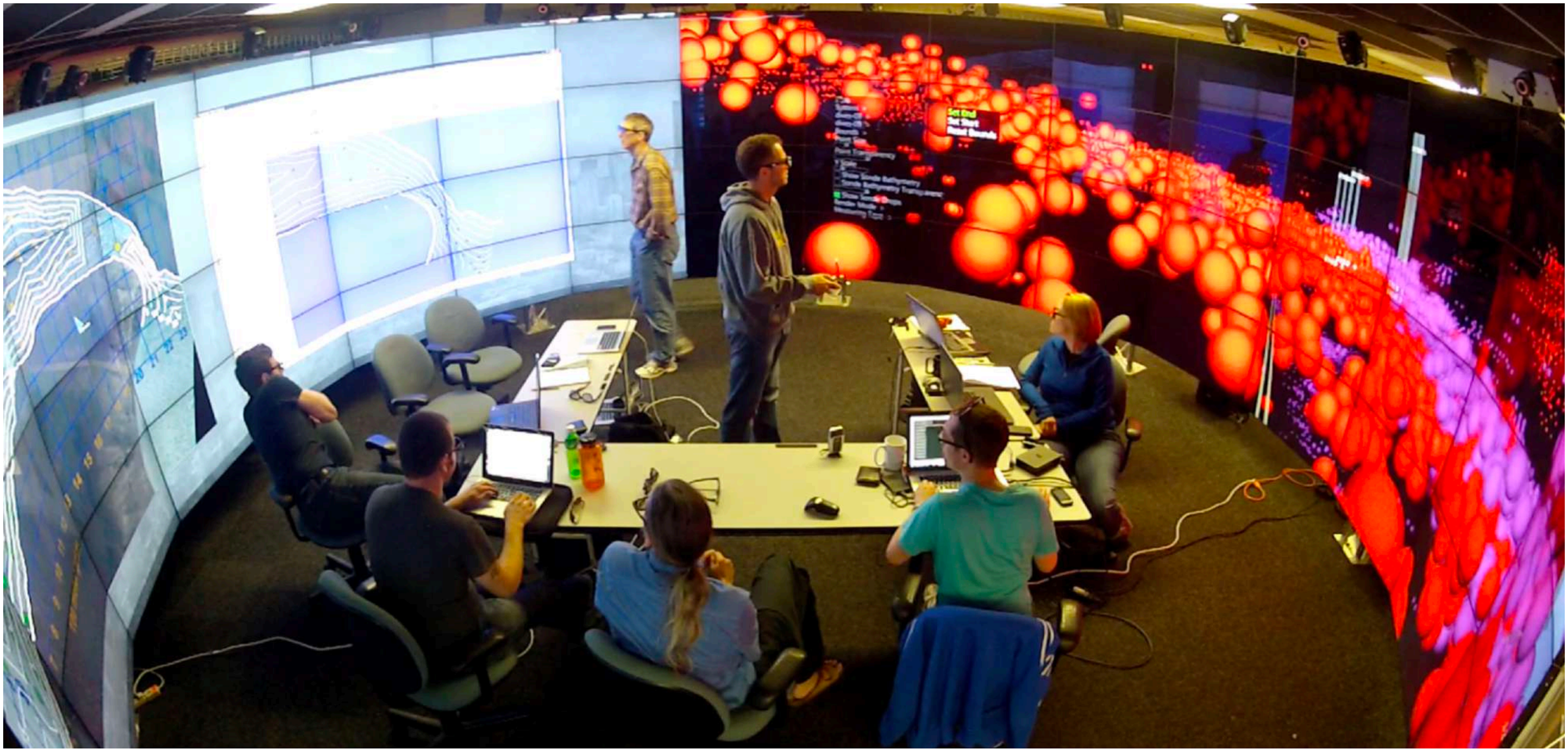
User feels like being **in** the virtual world.

D. A. Bowman, and R. P. McMahan. 2007. Virtual reality: how much immersion is enough? Computer 40(7):36–43.

CAVE

Cave **A**utomatic **V**irtual **E**nvironment

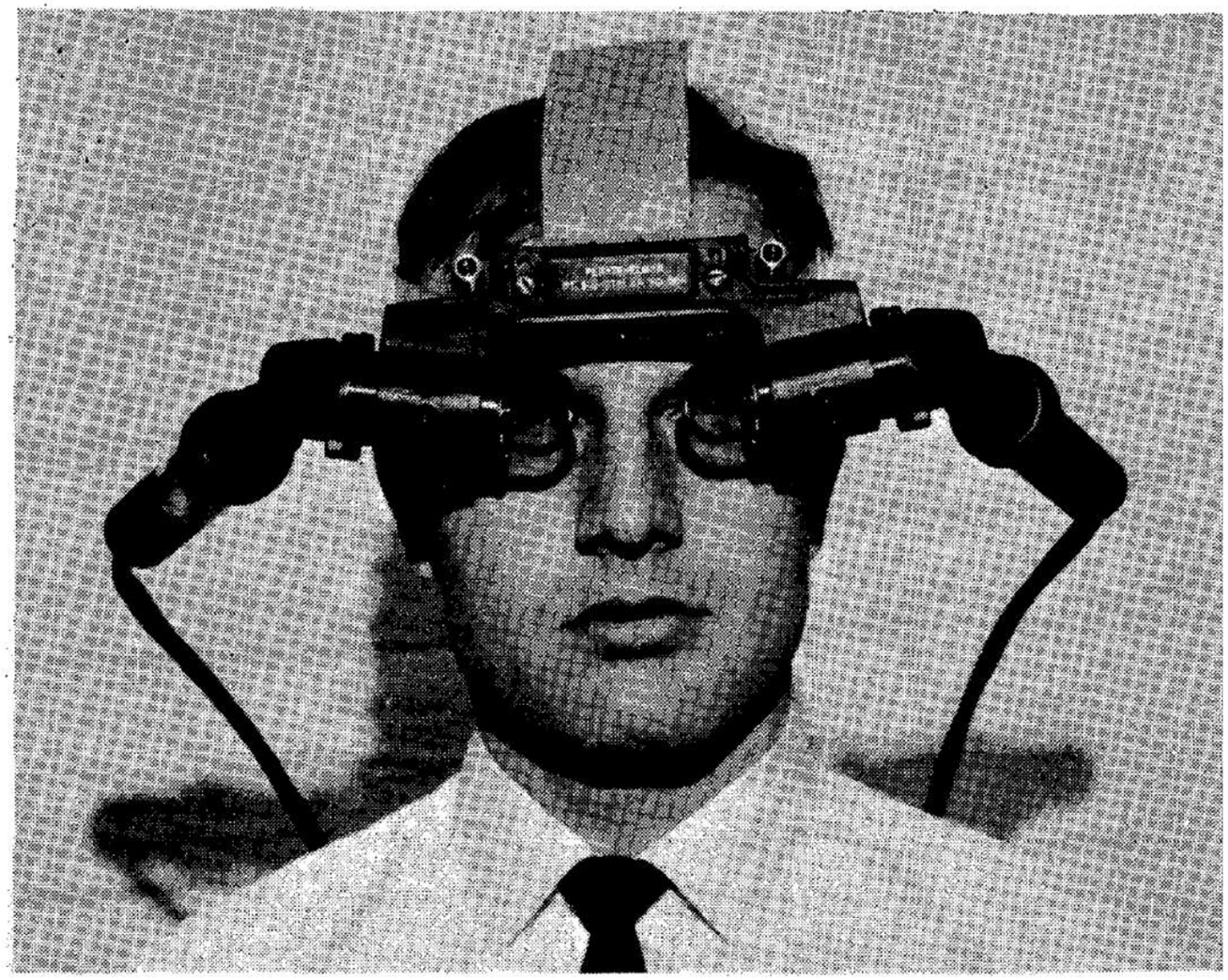
via bit.ly/IMG-Wiki-CAVE

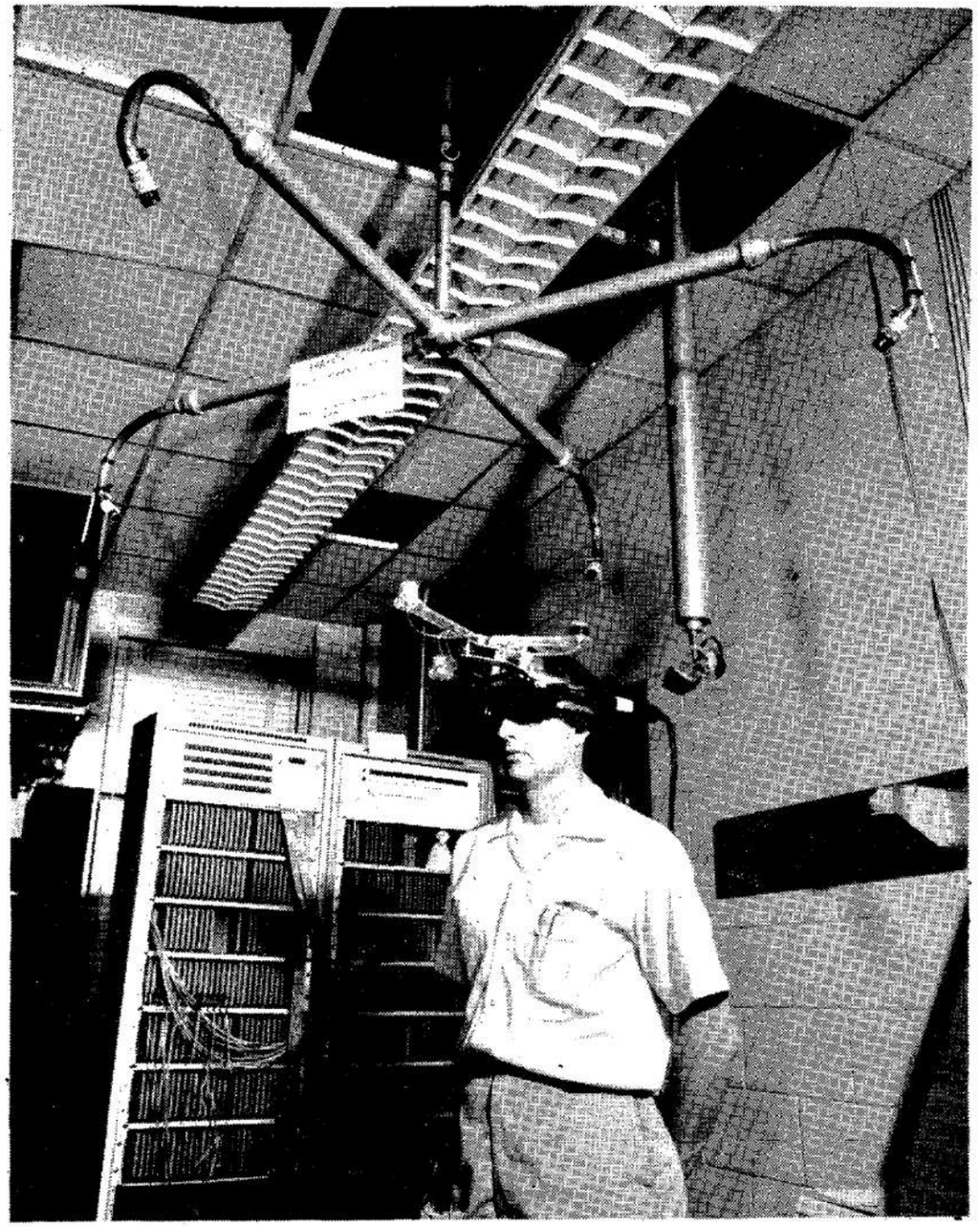


G. E. Marai, A. G. Forbes, and A. Johnson. 2016. Interdisciplinary immersive analytics at the electronic visualization laboratory: Lessons learned and upcoming challenges. In 2016 Workshop on Immersive Analytics, pp. 54-59.

HMD
Head-**M**ounted **D**isplay

via bit.ly/IMG-Wiki-HMD





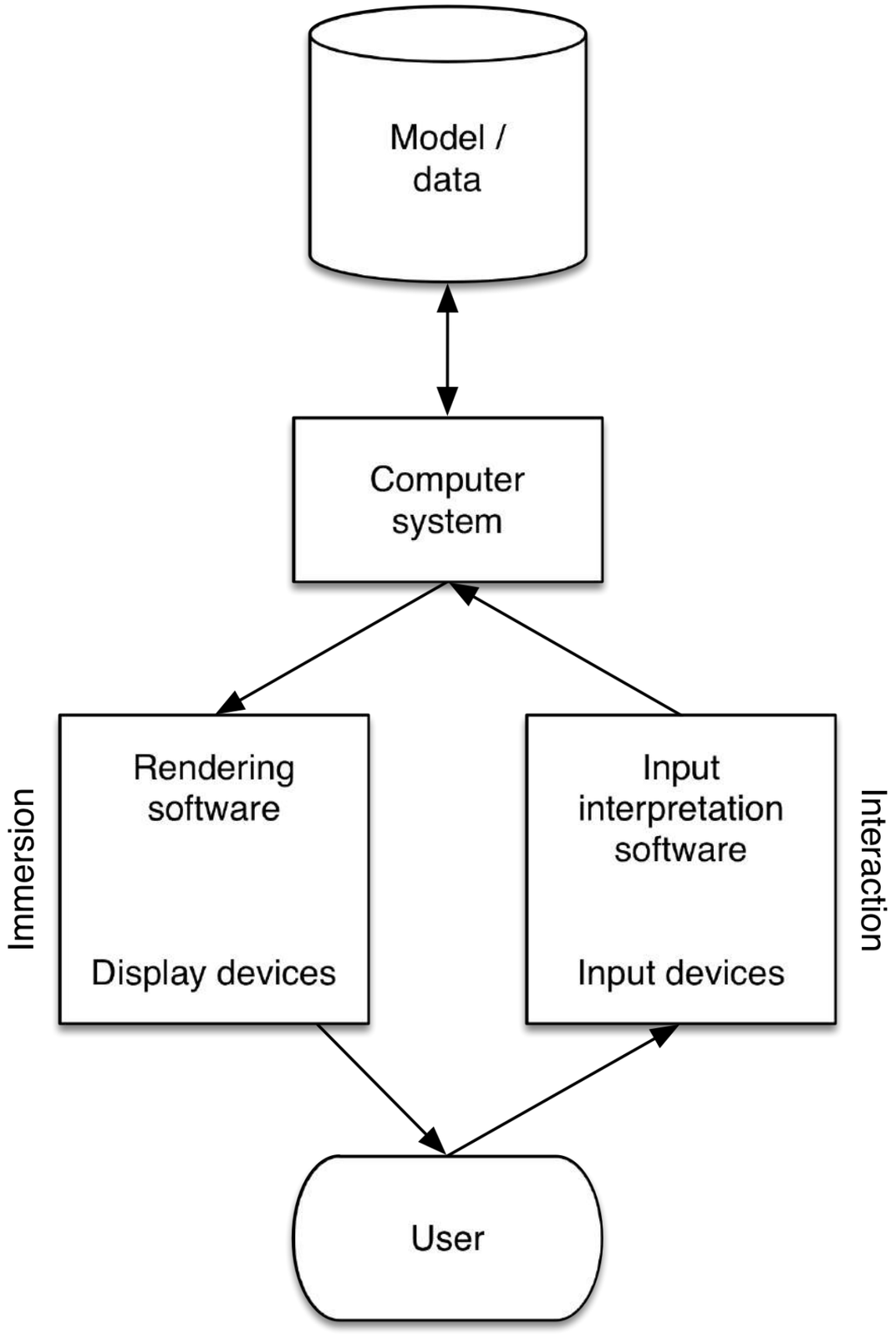
[I. E. Sutherland. 1968. A head-mounted three dimensional display. In Proceedings of the December 9–11, 1968, fall joint computer conference, part I–AFIPS ’68 (Fall, part I), ACM, New York, NY, USA, pp 757–764.]

via bit.ly/VR-Oculus

via bit.ly/Vive-DevFuture

via bit.ly/PS-VR

via bit.ly/VR-GoogleCardboard



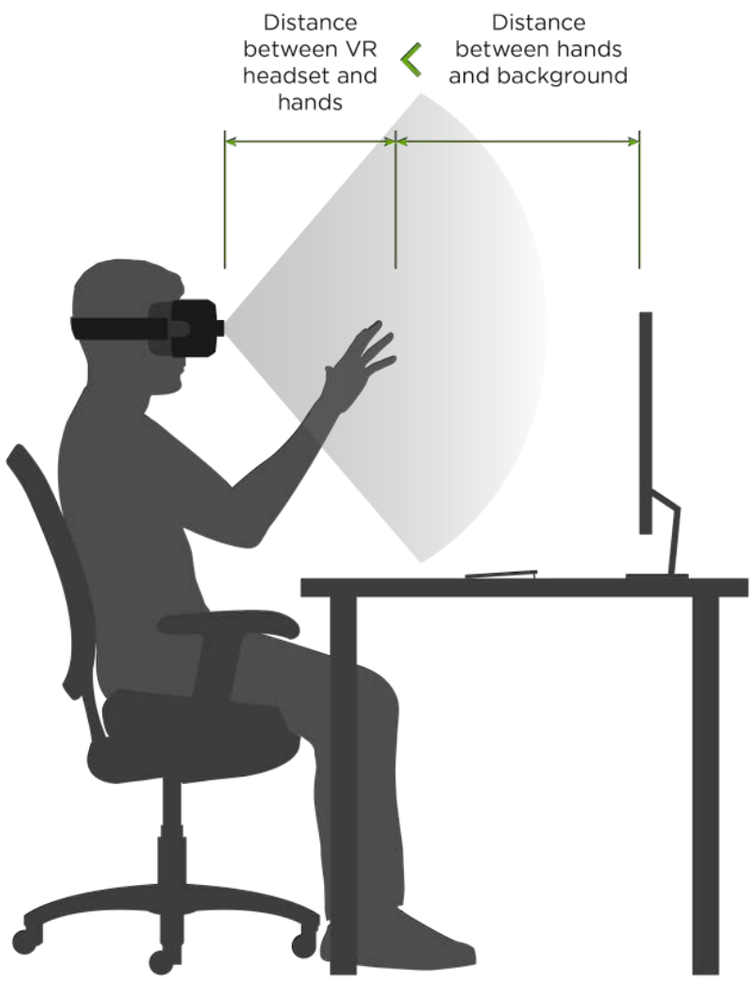
Human-Virtual Environment Interaction Loop

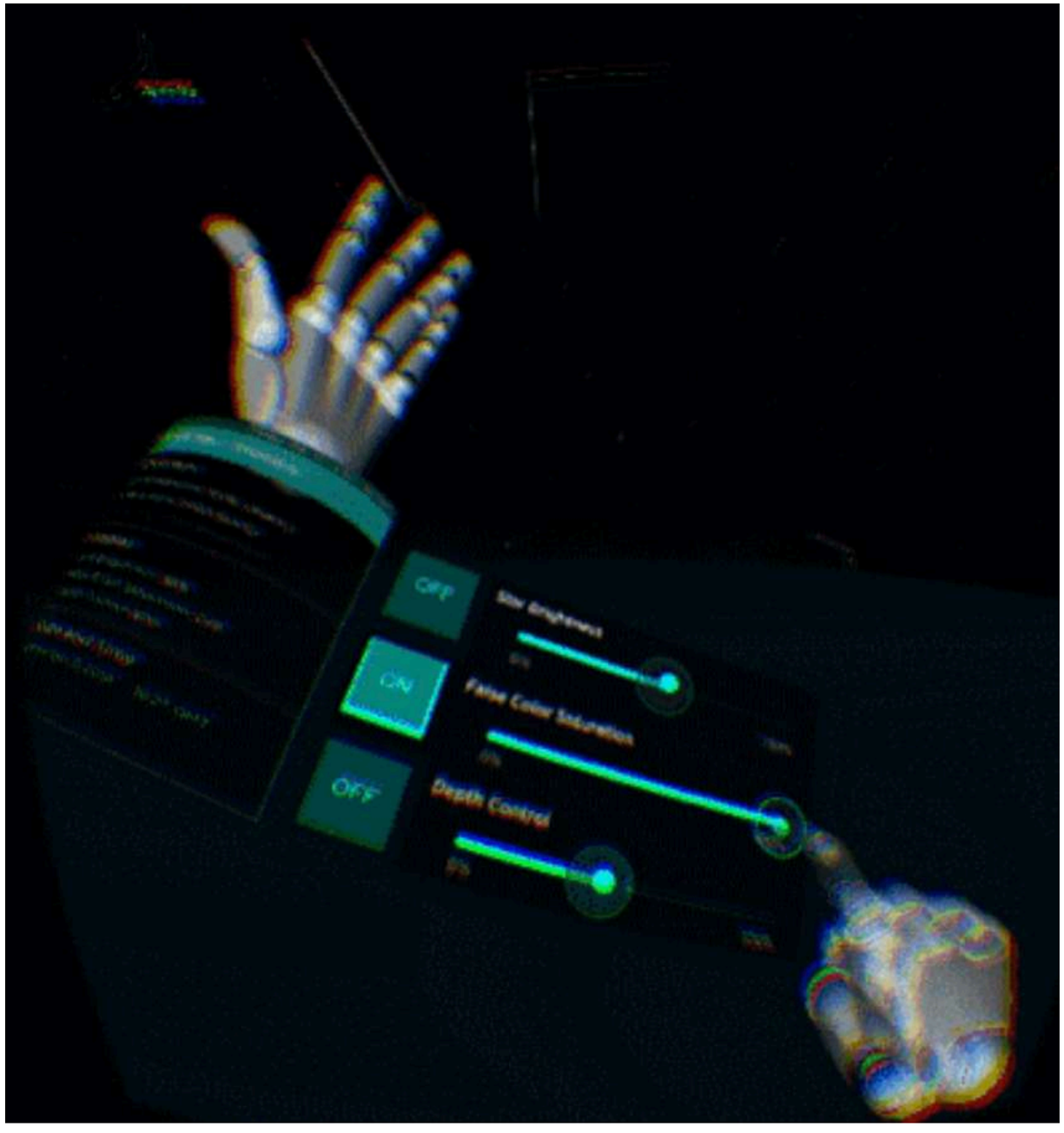
D. A. Bowman, and R. P. McMahan. 2007. Virtual reality: how much immersion is enough? Computer 40(7):36–43.

via play.google.com

via roadtovr.com

via xbox.com





via blog.leapmotion.com

via tomshardware.com

via vive.com

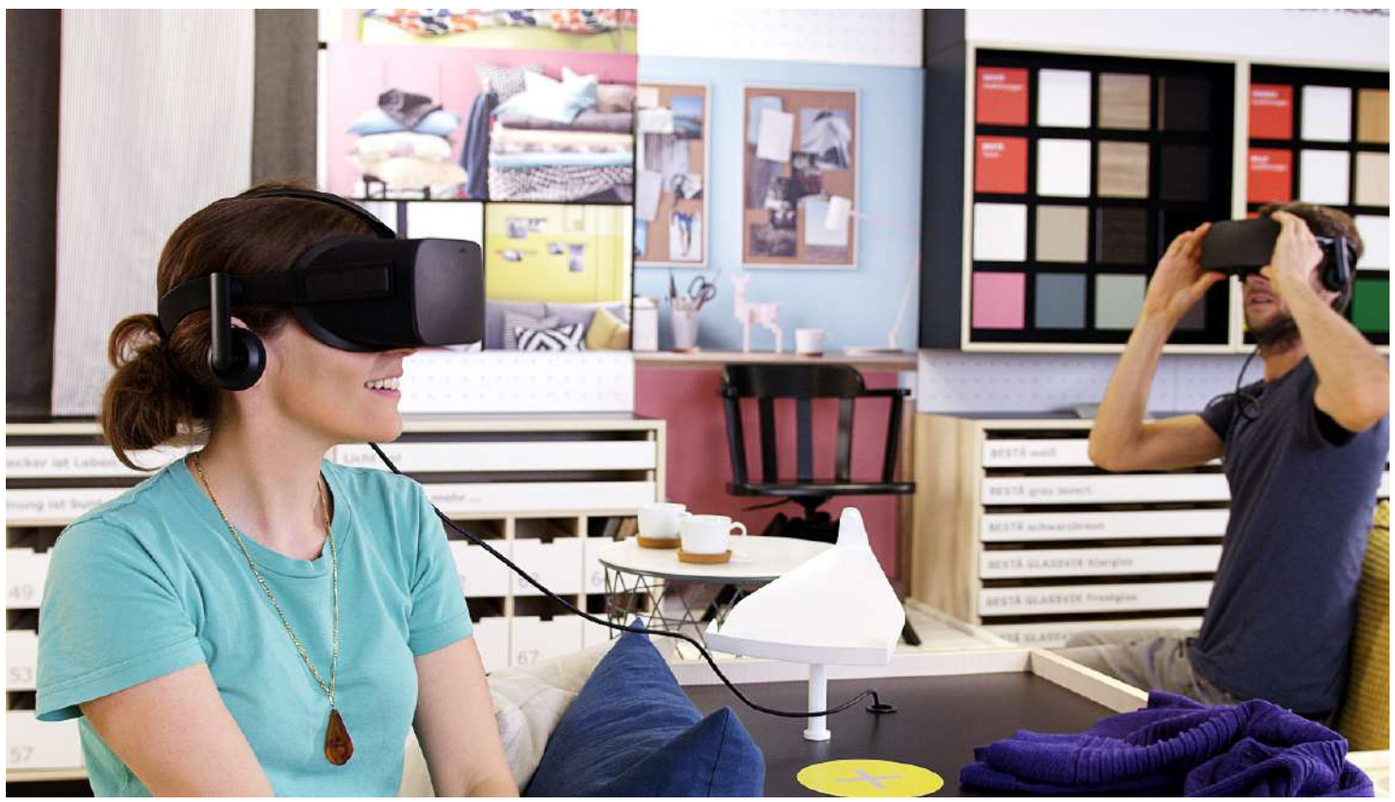
The other kind of “virtual”
IKEA warehouse’s 2nd floor

via www.ikea.com

Interior Design

IKEA VR Experience and IKEA VR Showroom

via ikea.com



via demodern.com

Entertainment / Games

Star Wars Battlefront - Rogue One: X-Wing VR Mission

Virtual Reality (VR)

via starwars.ea.com

via youtube.com

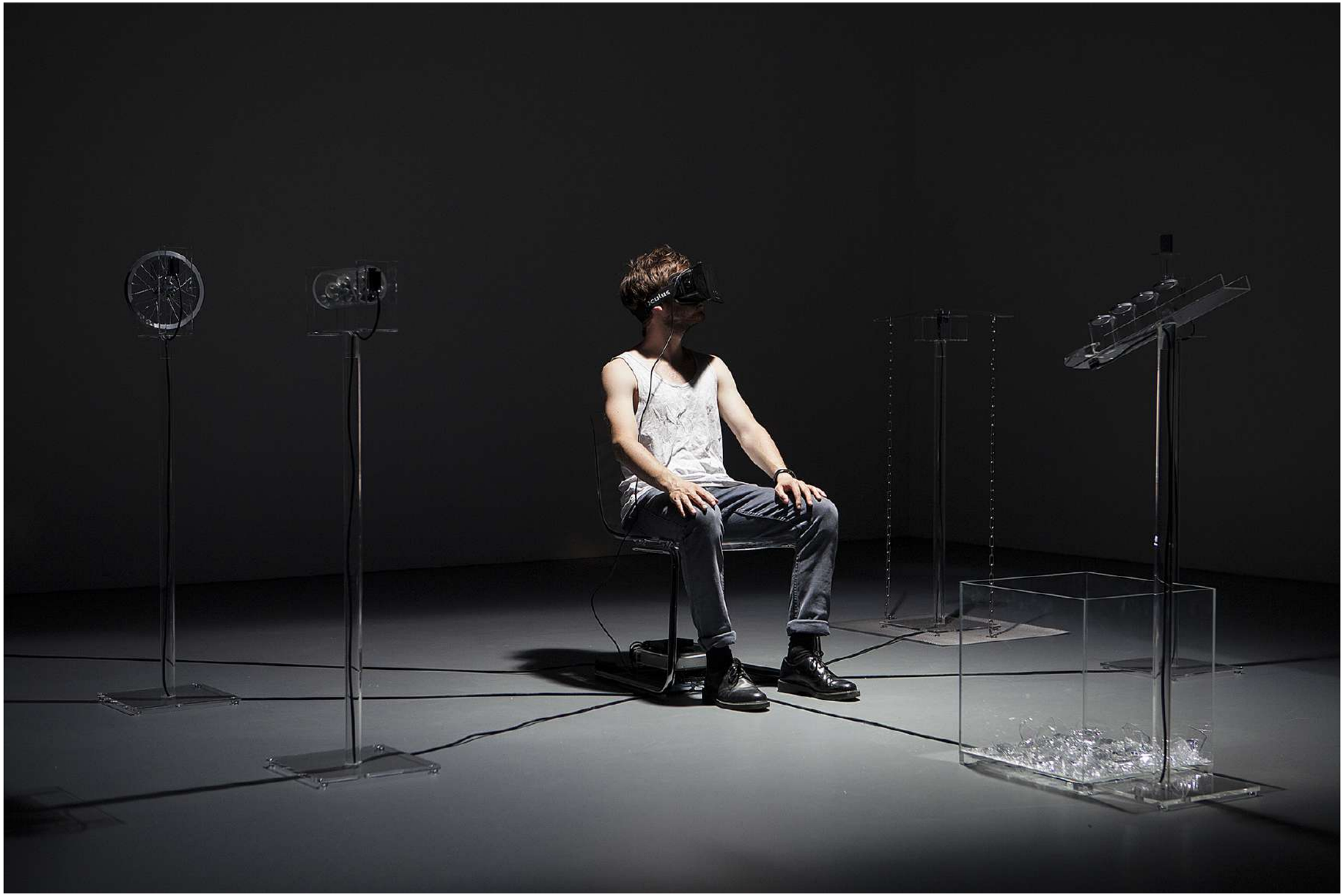
via bit.ly/KRZ-Entertainment

via bit.ly/VR-TitansOfSpace

Experimental / Artistic

OccultUs by Simon de Diesbach – Designing for alternate reality

Virtual Reality (VR)



via bit.ly/CA-OccultUs

Science / Artistic

In the Eyes of the Animal

Virtual Reality (VR)

via bit.ly/CC-EyesOfAnimal

Entertainment / Games
Rick and Morty: Virtual Rick-ality

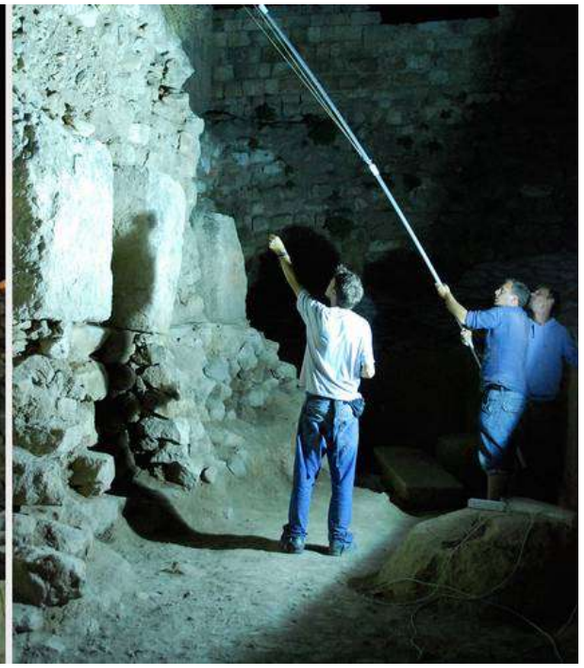
Virtual Reality (VR)

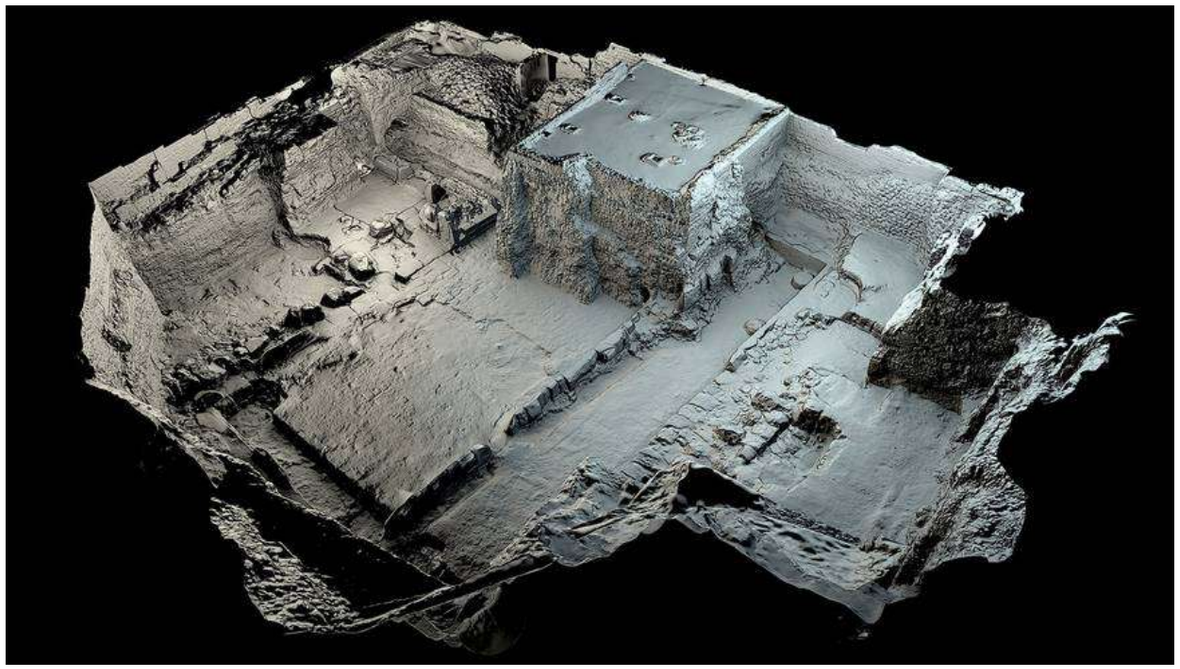
via [adultswim.com]

Science / VR as a tool

Virtual Archaeology @ HTW Berlin

Virtual Reality (VR)

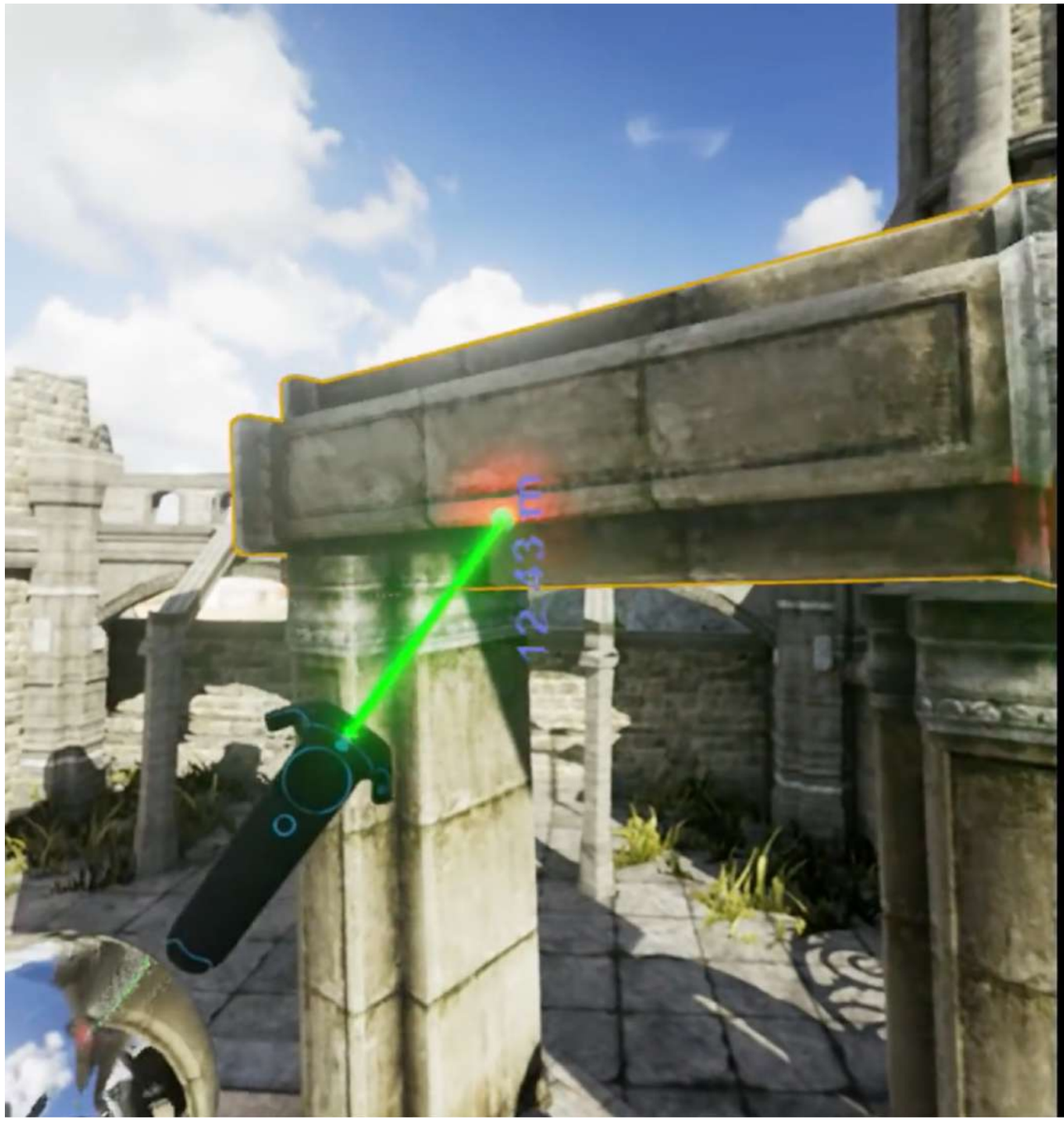




via gamedesign.htw-berlin.de/forschung/virtual-archaeology/

VR as a tool

VR content creation using Unreal Engine 4 editor



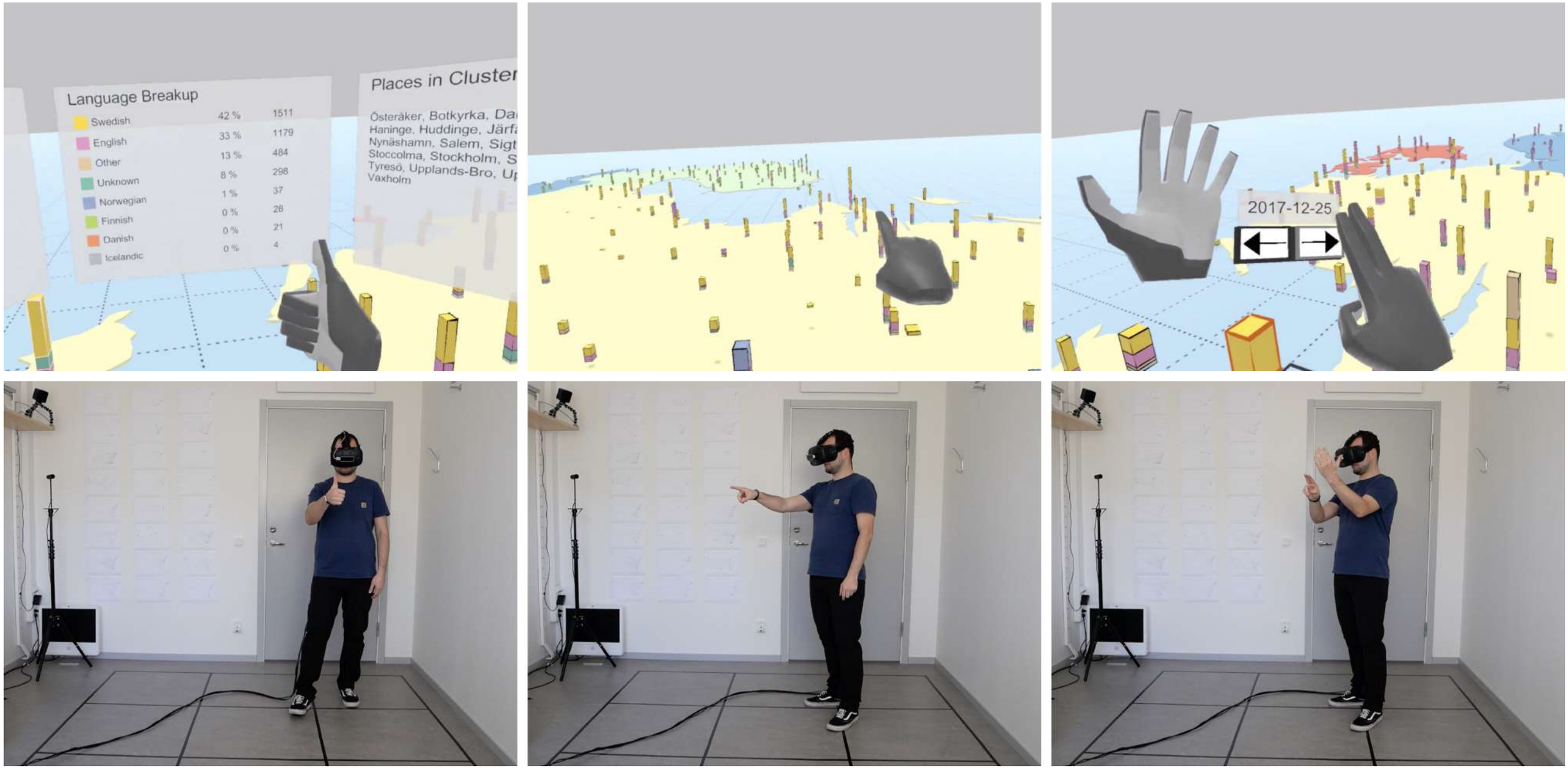
via bit.ly/Vive-UE4-Editor-Preview

Games / e-Sports
DOTA 2 VR Hub (spectator mode)

Virtual Reality (VR)

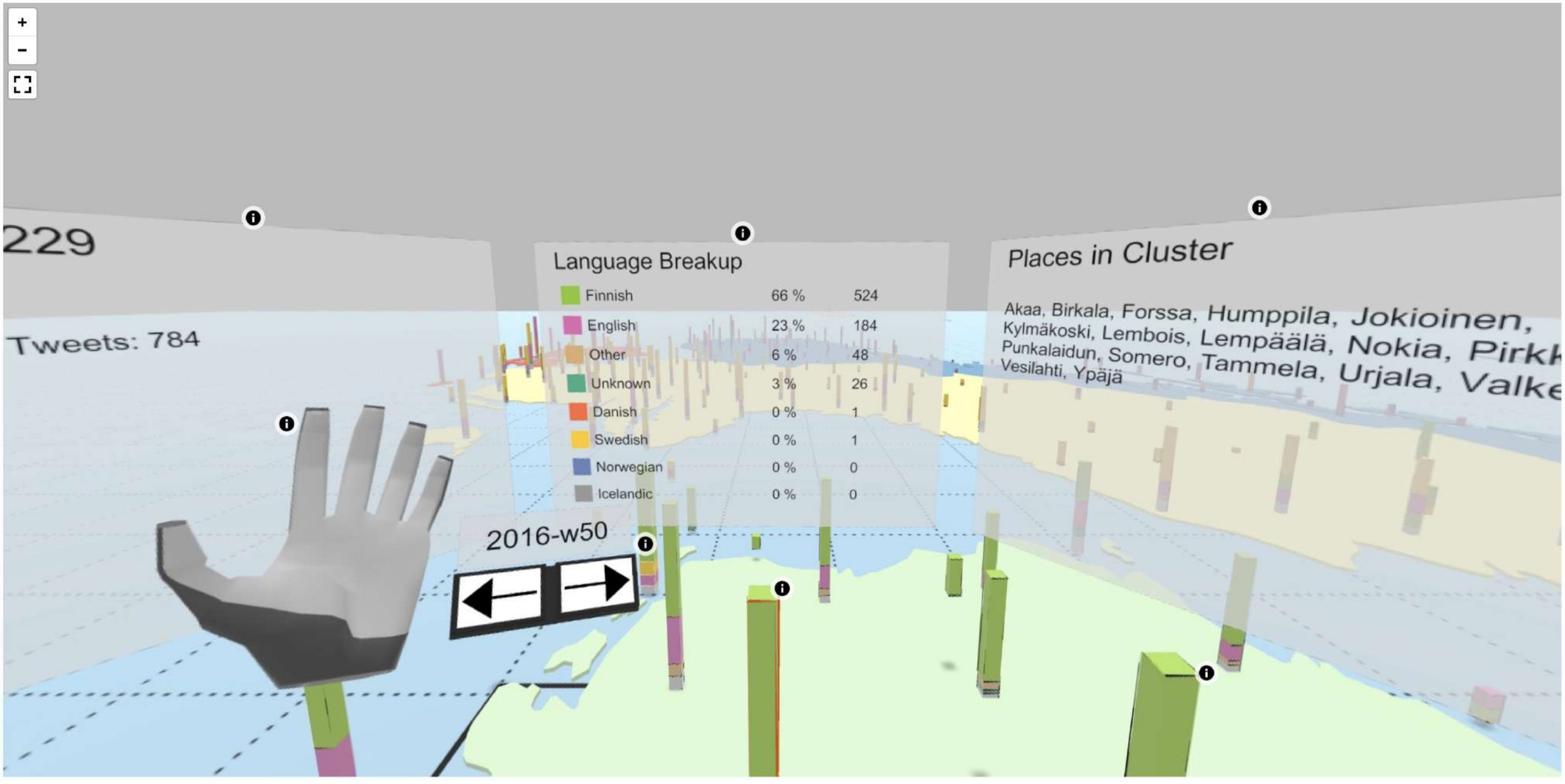
via [engadget.com]

using immersive technologies, such as VR, to explore language variability within tweets in the Nordic countries; collaboration with Department of Languages at LNU



via vimeo.com/vrxar/hcia-wip2018

Try yourself, and get a “visual impression” (in 2D) of the computer-generated, virtual 3D environment (on your mobile or desktop device).

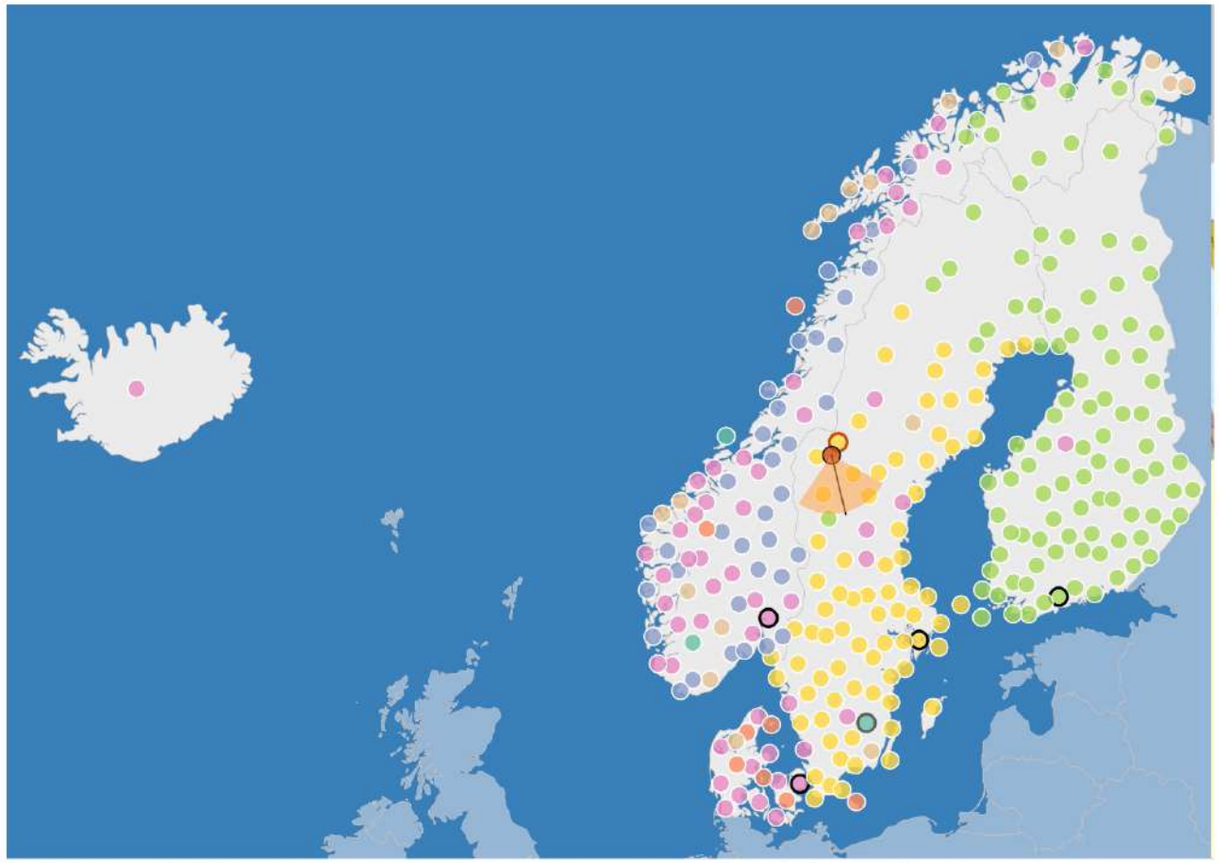


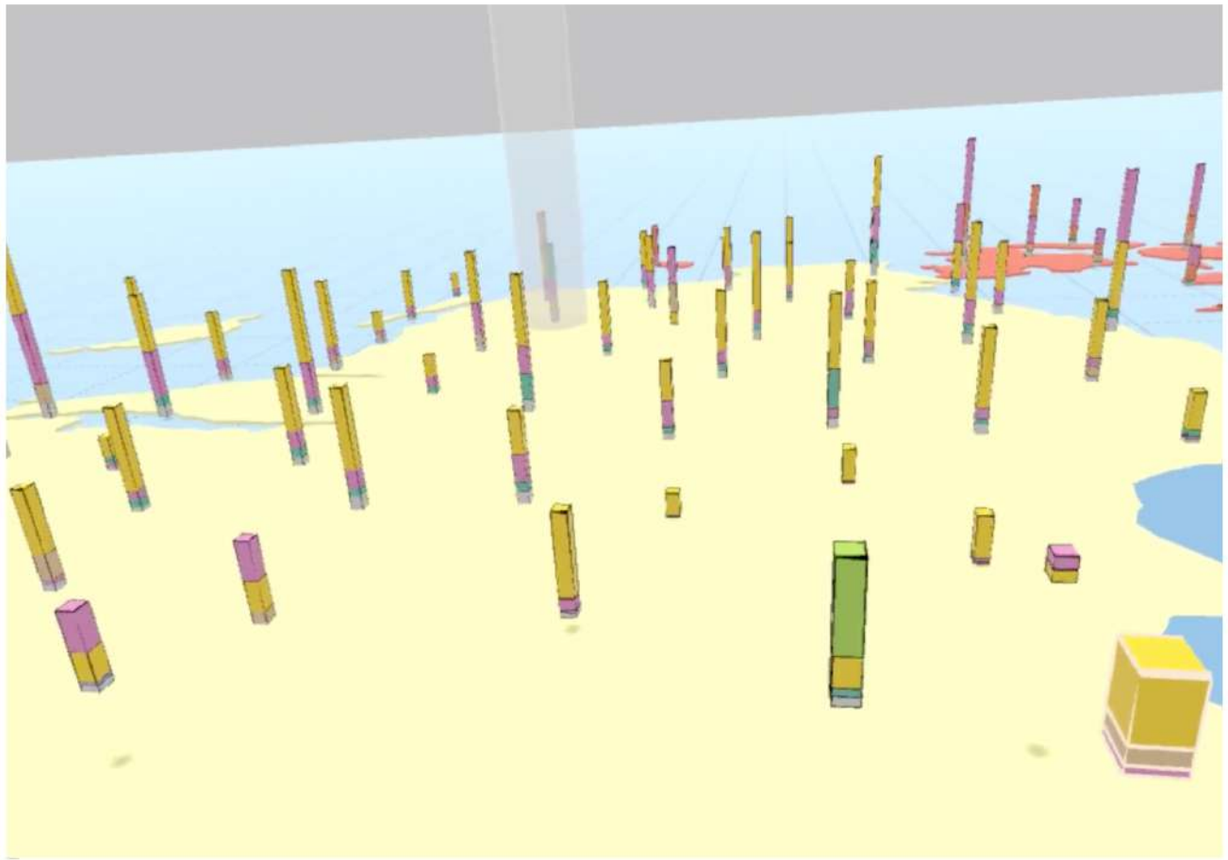
via vrxar.lnu.se/apps/odxvrxnts-360/ and vrxar.lnu.se/apps/odxvrxnts-360/time.html

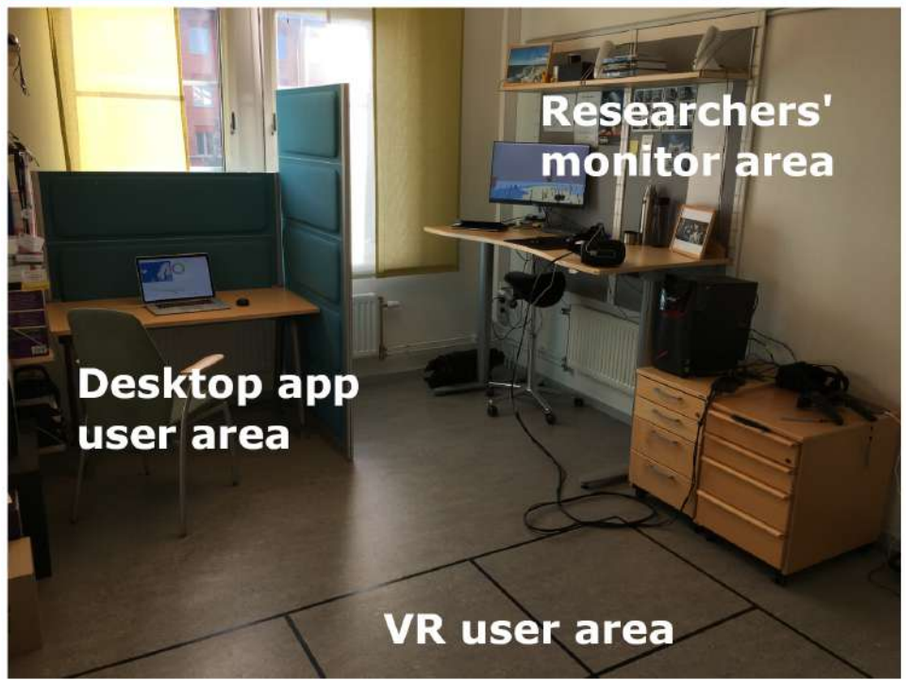
Current activities at VRxAR Labs

Hybrid Collaborative Immersive Analytics

Virtual Reality (VR)



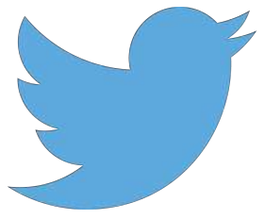


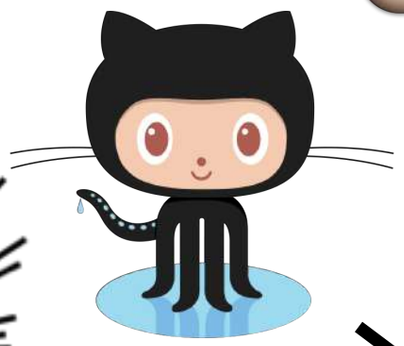


via vimeo.com/vrxar/hcia-wip2018

VRxAR Labs' research interest (simplified)

vrxar.lnu.se



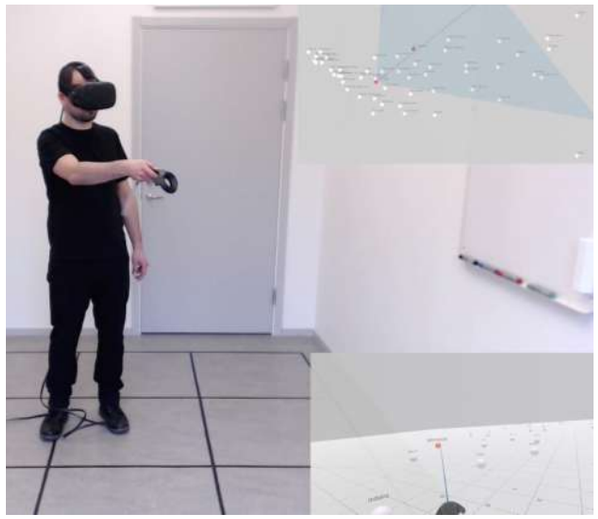


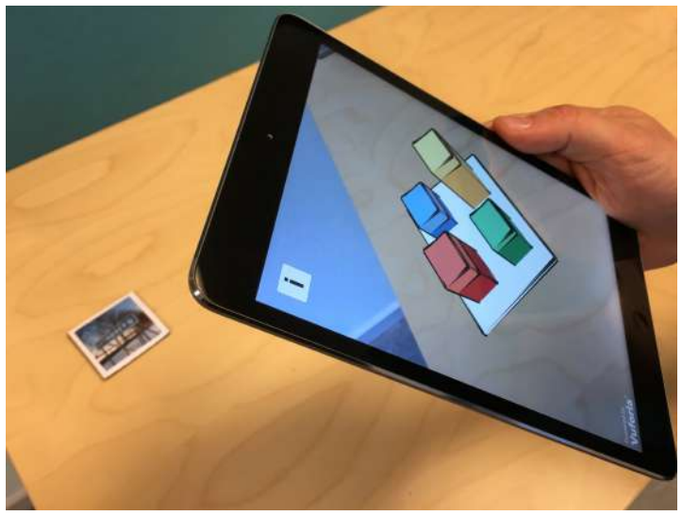
Aggregation

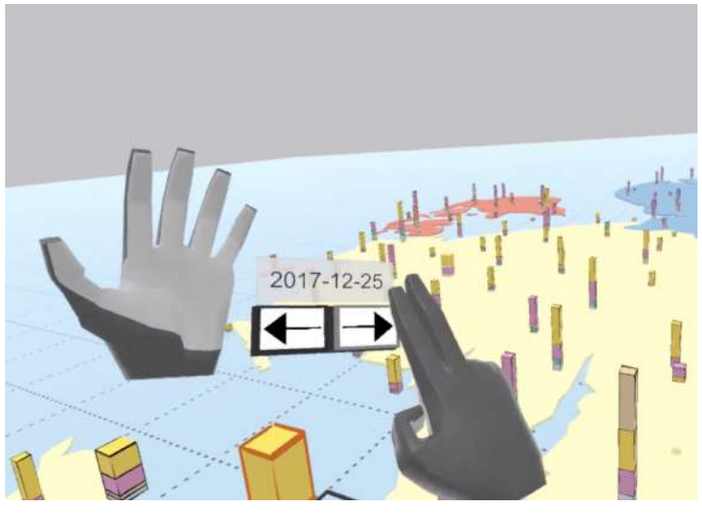
Visualization

Interaction

Virtual Reality (VR)







- VIRTUAL REALITY

  by Steven M. LaValle

- Building Virtual Reality

  by Jody Medich and Daniel Plemmons

- VRCH - Virtual Reality Architecture

  by Daniel Voshart

- Immersive Design: Learning to let go of the screen

  by Matt Sundstrom

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Additional references

Portal icons in the presentation available via
bit.ly/portaliconpack