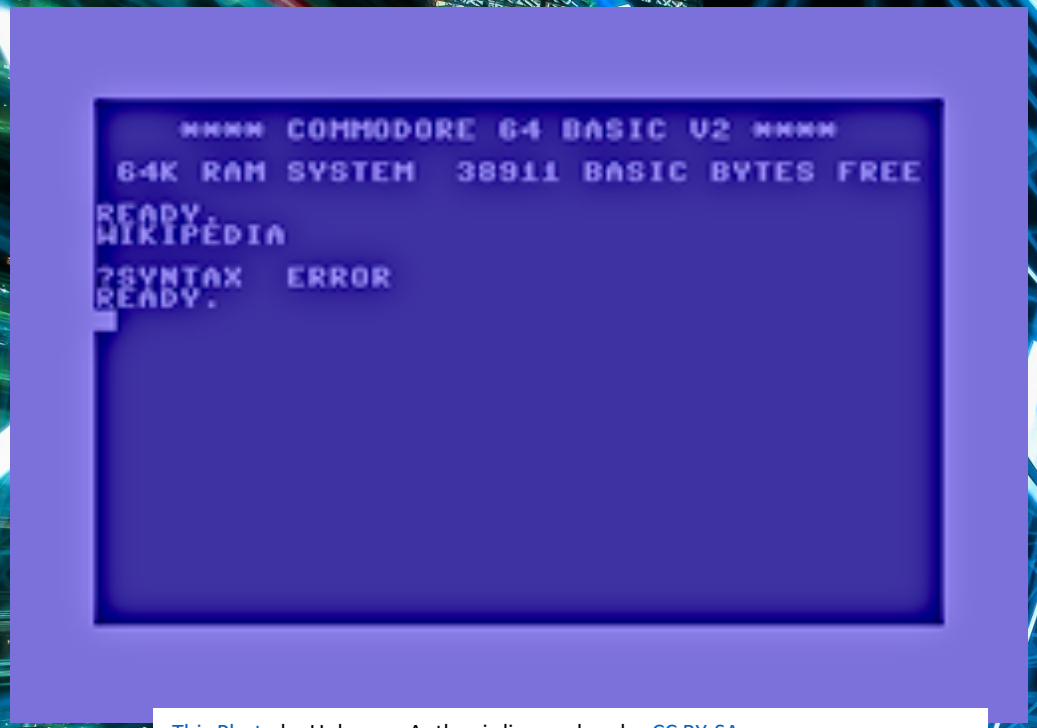
Deep into VR testing

Noemi Ferrera
@thetestlynx



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Noemi Ferrera

Original from Spain

Computer scientist

- @thetestlynx
- Blog: noemiferrera.com
- Github.com/thetestlynx

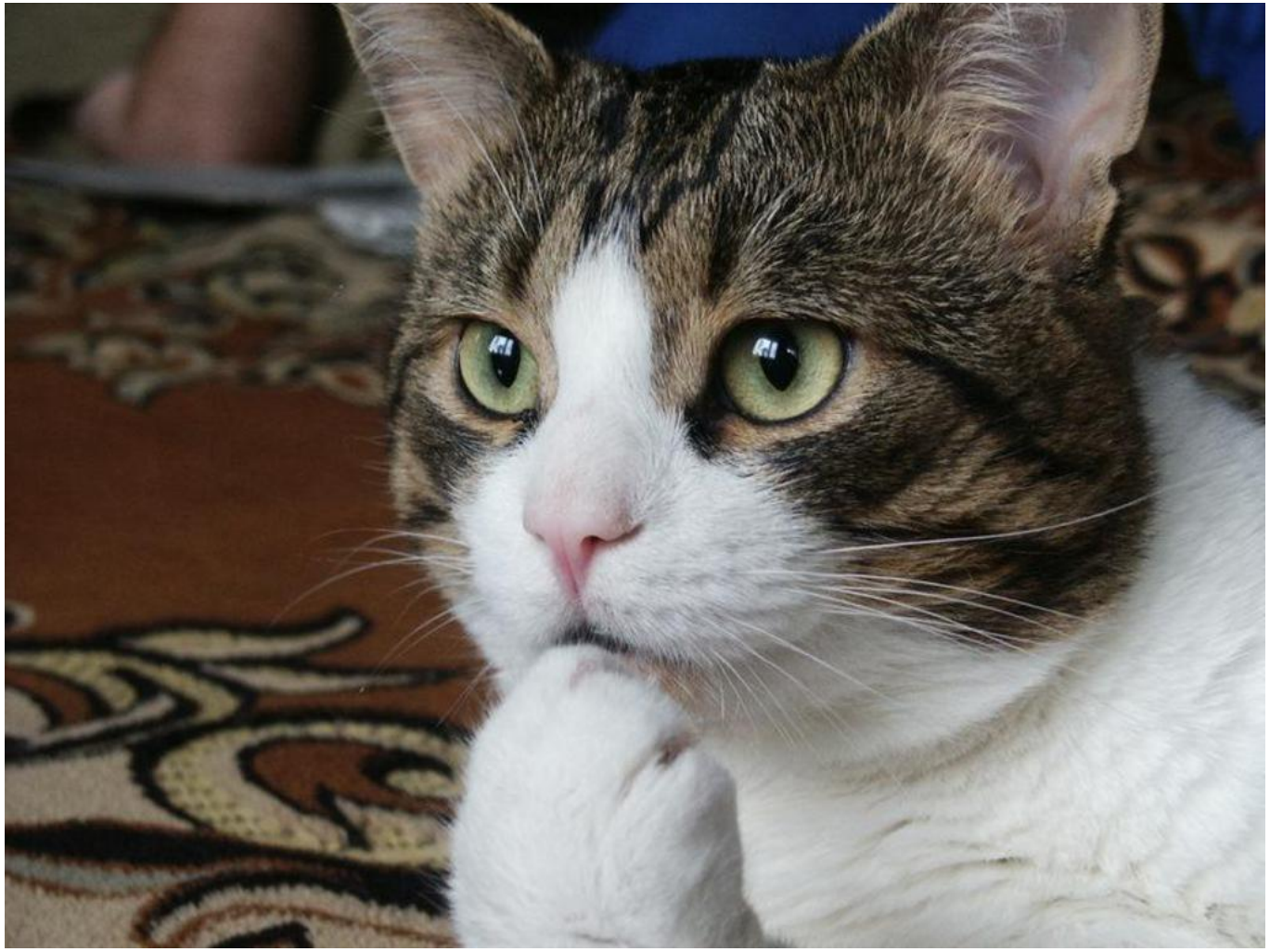
- Solution Architect at Sauce Labs
- Before: Netease (China), Videobot, Dell, Microsoft and IBM (Ireland)

- In and out of dev/test roles
- With these languages:
  - C#
  - Python
  - Java
  - Others…

International speaker

VR/AR/MR/XR…?

- VR – Virtual reality
- AR – Augmented reality
- MR – Mixed reality
- XR – Cross reality



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Deep into VR

1975

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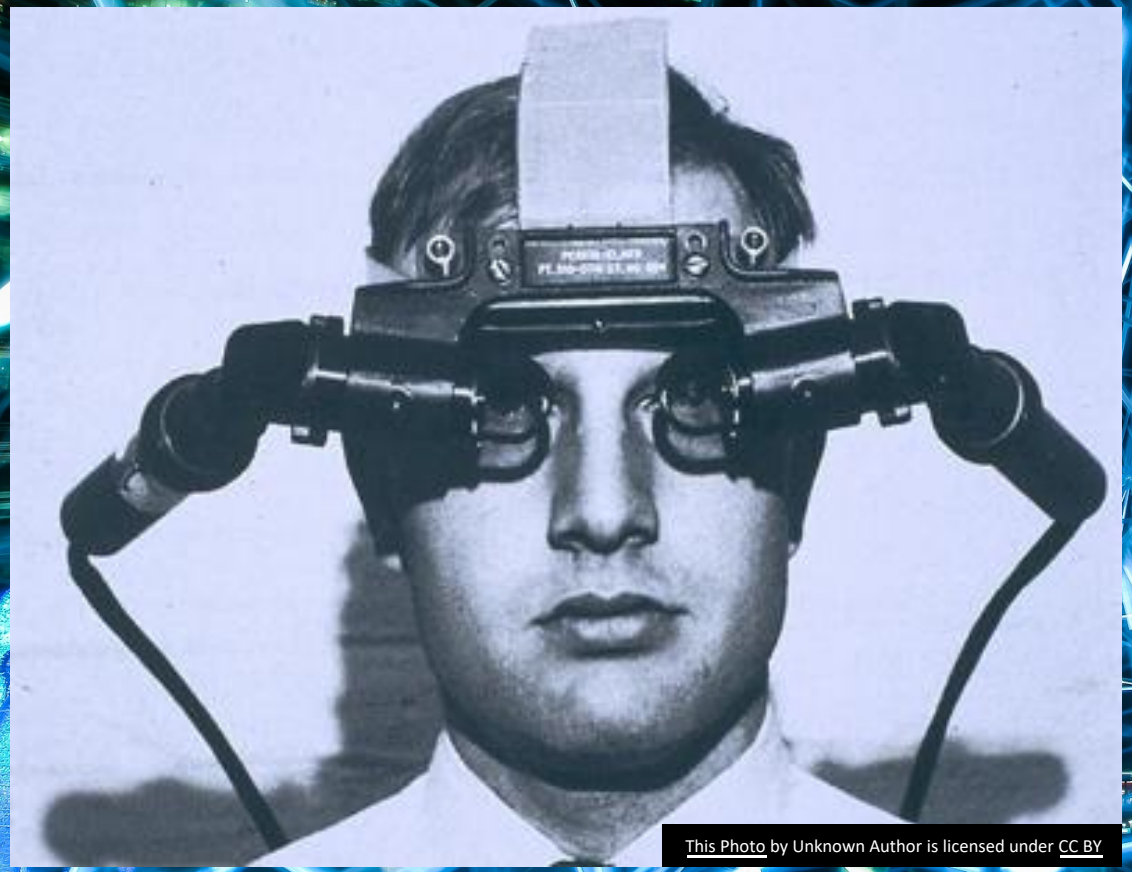
1968 - Damocles sword



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SegaVR (91)

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Nintendo Virtual Boy (95)

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2010 Oculus

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2014 Google Cardboard

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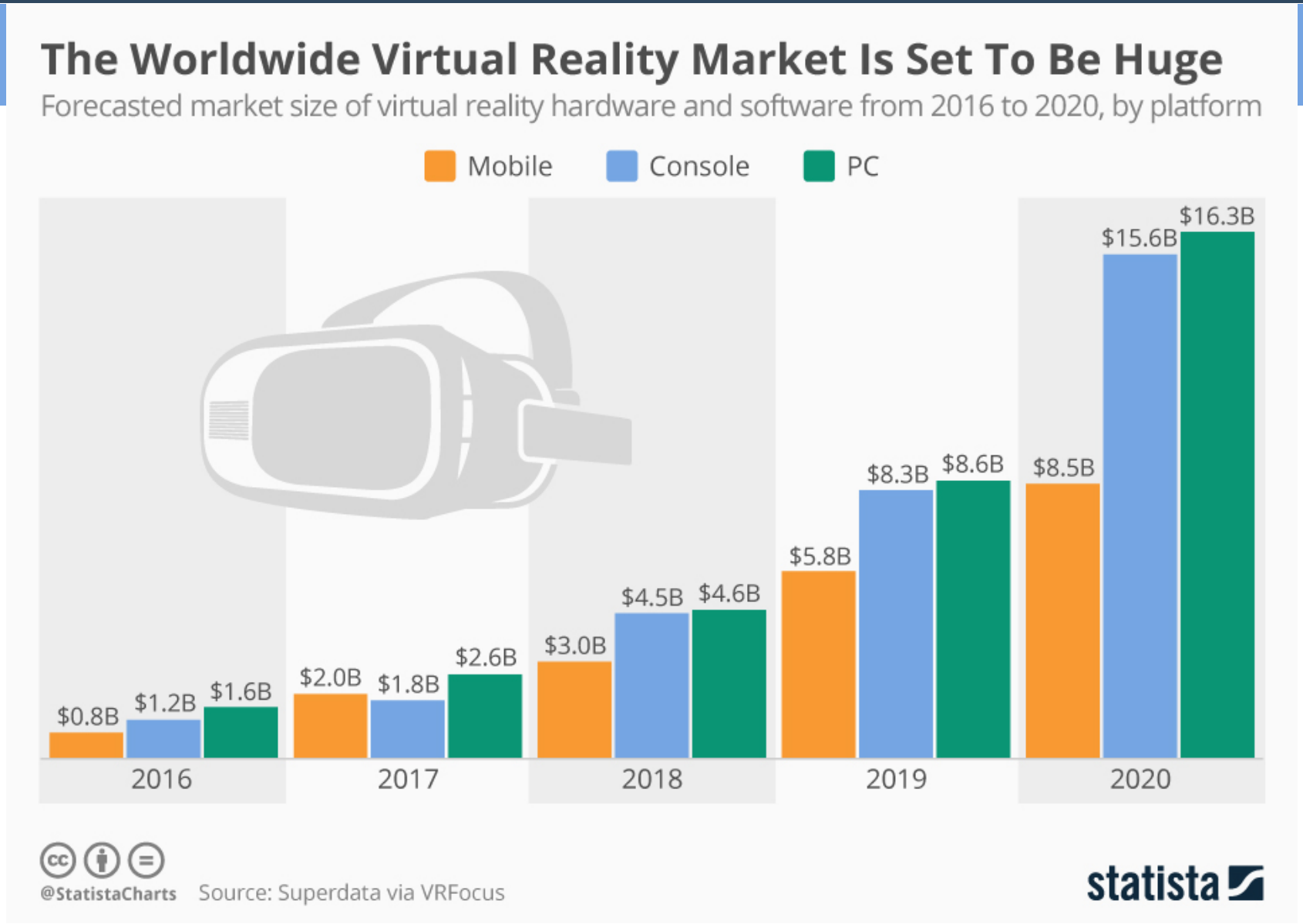
Why?



https://www.statista.com/chart/6677/the-worldwide-virtual-reality-market-is-set-to-be-huge/

Why?

https://venturebeat.com/2019/10/12/digi-capital-mixed-reality-investors-should-look-at-europe/

Why?

Photo by Jesper Aggergaard on Unsplash

Picture credit mentatdgt

VR devices: how to choose?

- Headset VS handset
- Phone powered VS Self-powered VS

  PC-powered VS console-powered
- Different platforms
- Wired VS Wireless
- Resolution, tracking, technical specs

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meduza.io/en/shapito/2019/11/26/moscow-area-cows-enjoy-summer-year-round-with-new-virtual-reality-glasses

LIKE IT OR NOT

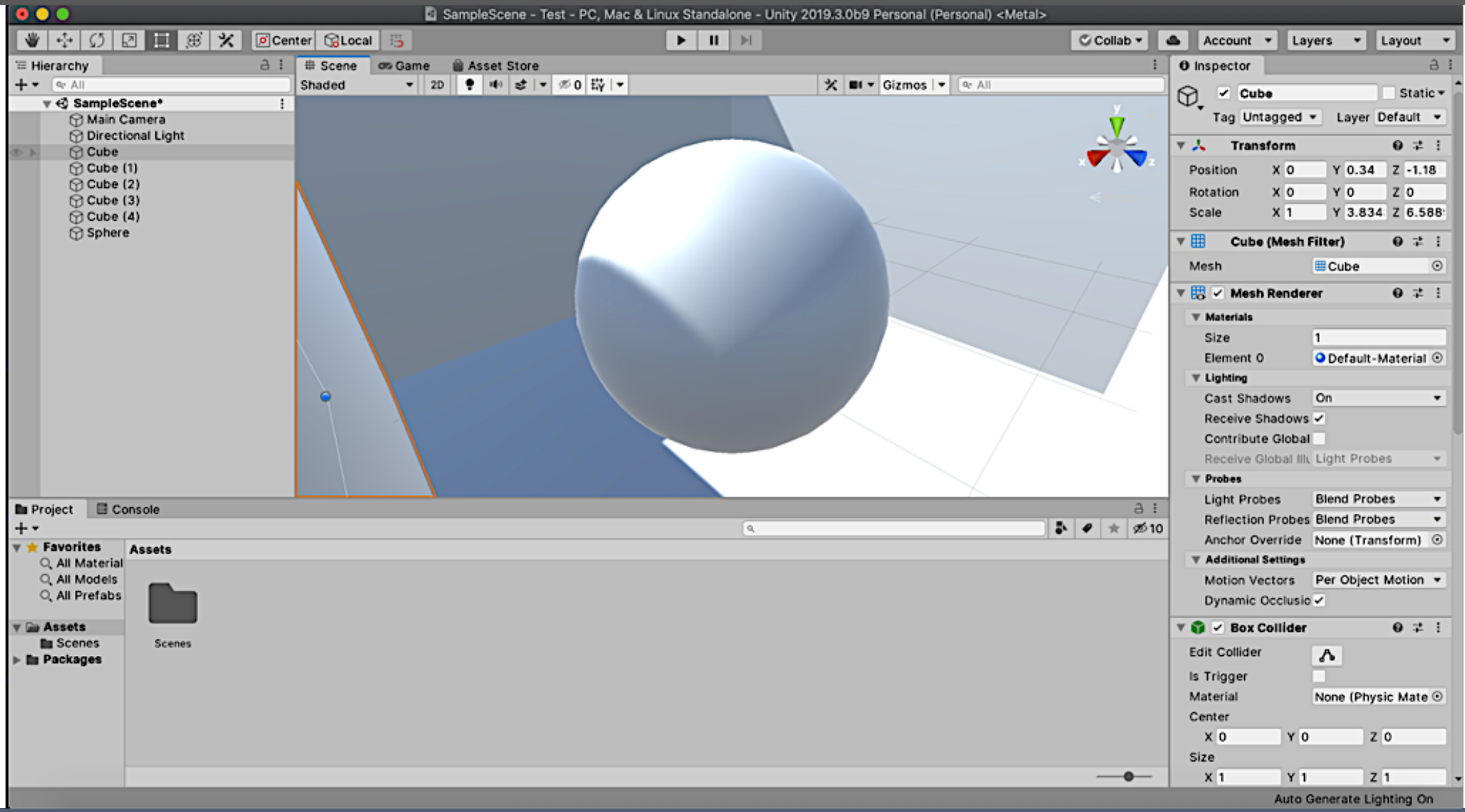
Moscow-area cows enjoy summer year-round with new virtual reality glasses

11:08 pm, November 25, 2019 · Source: Meduza

Adve

iting for securepubads.g.doubleclick.net...

VR platforms: Unity



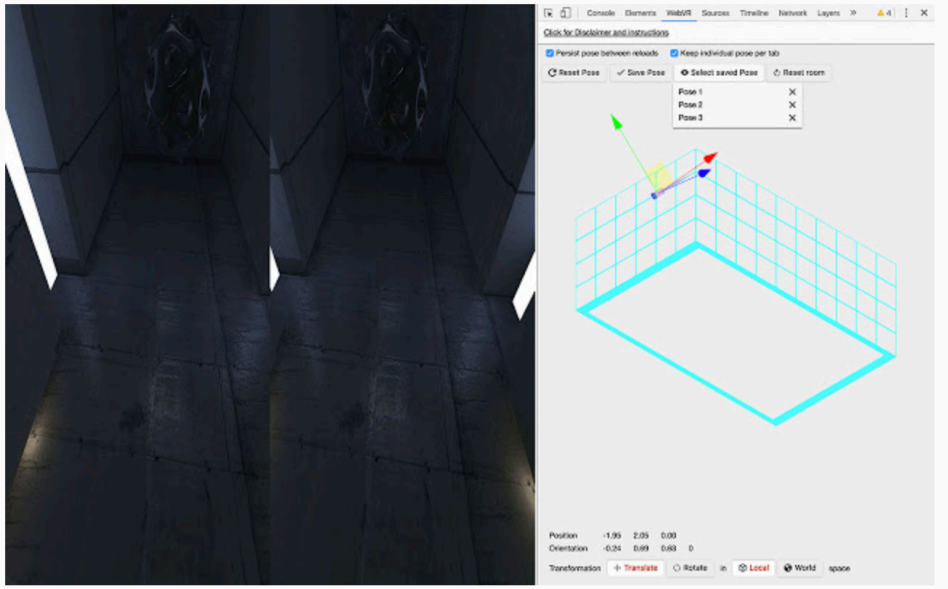
VR platforms: Unreal

https://www.unrealengine.com/en-US/blog/shotgun-integration-now-available-in-unreal-engine-4-20

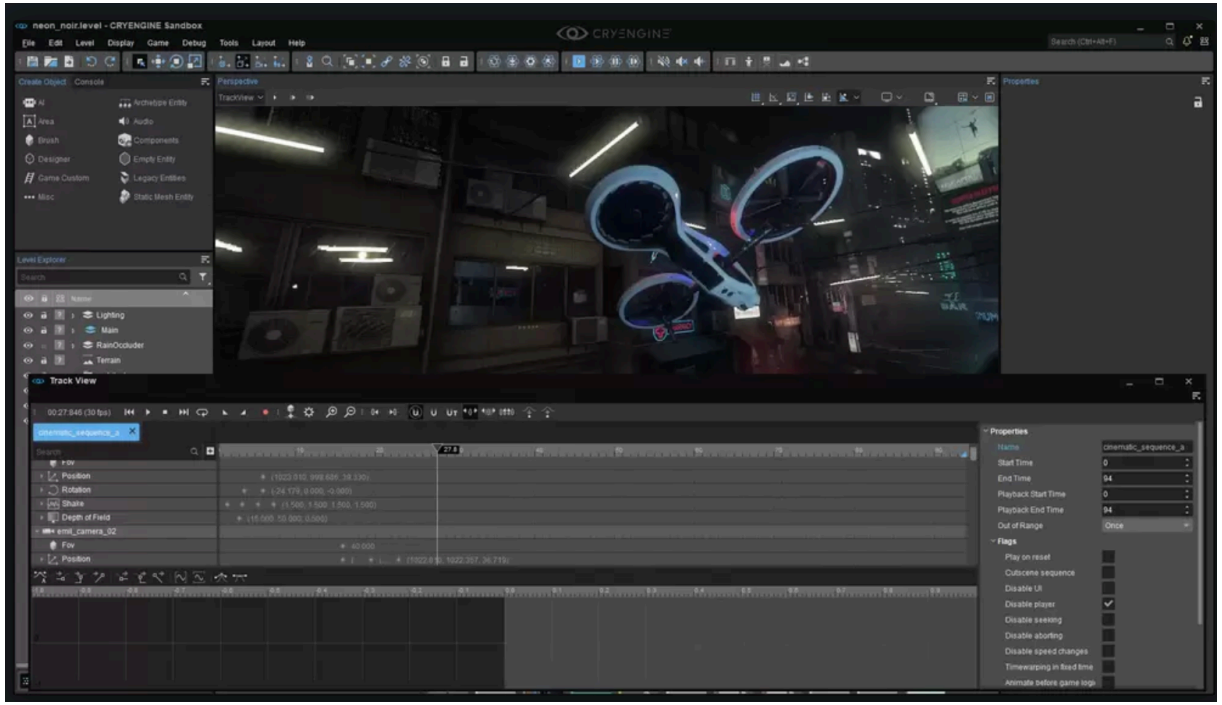
https://docs.unrealengine.com/en-US/Programming/Automation/index.html

VR platforms: Others

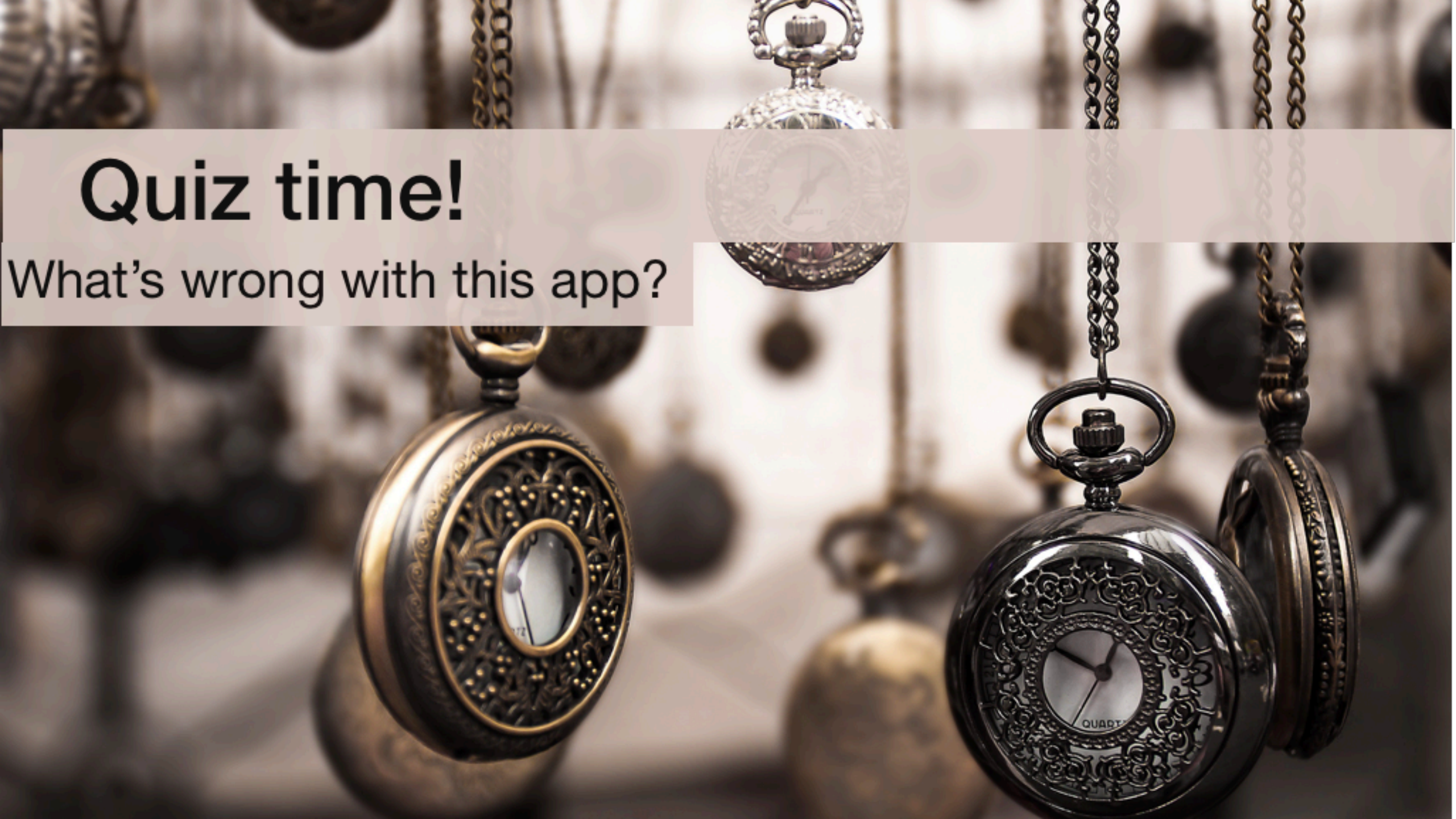
- CryEngine: C++, flash, action Script. Not for mobile
- Amazon Lumberyard (based on above), android
- WebVR: for websites, js



https://webvr.info/



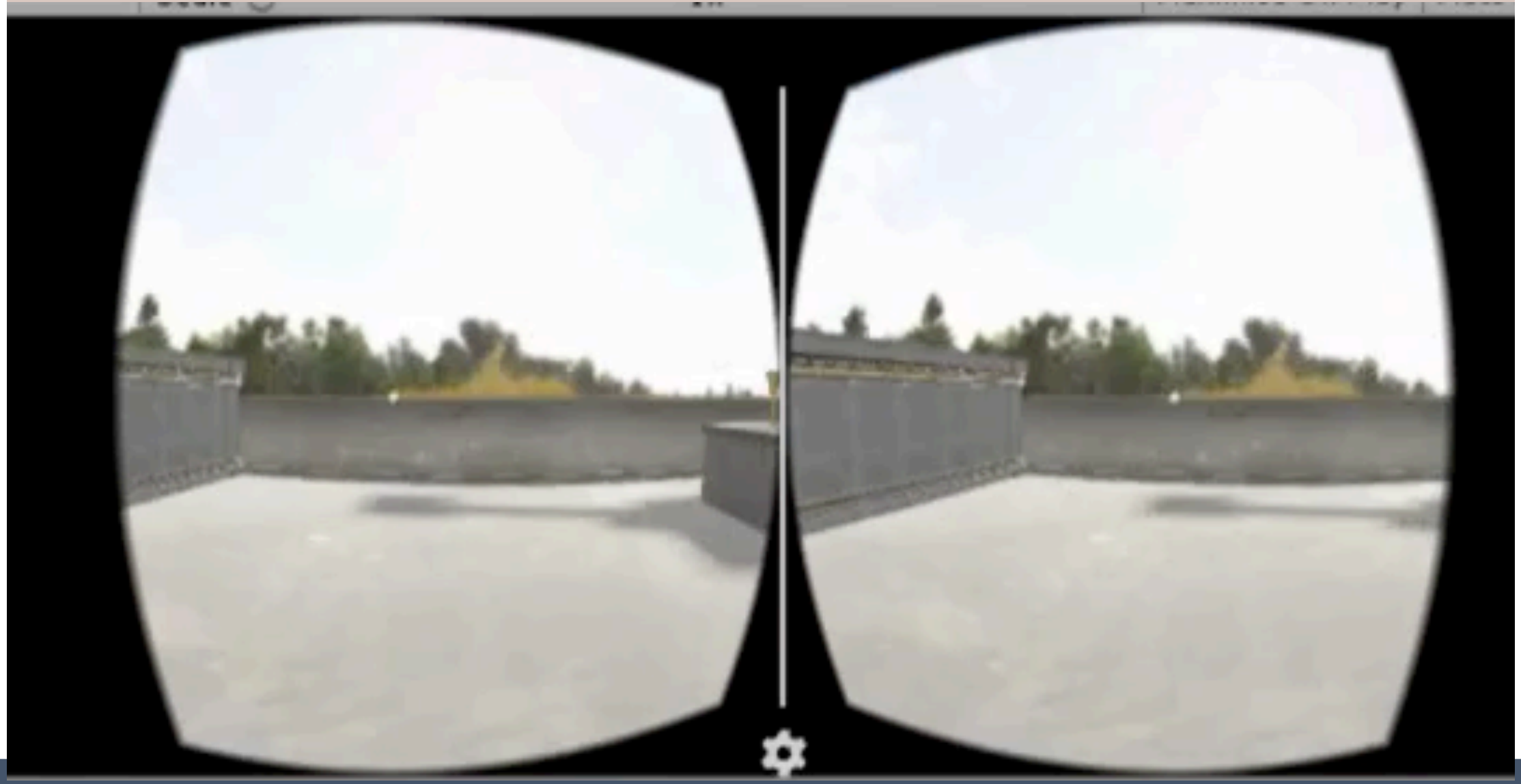
https://www.cryengine.com/features/view/sandbox



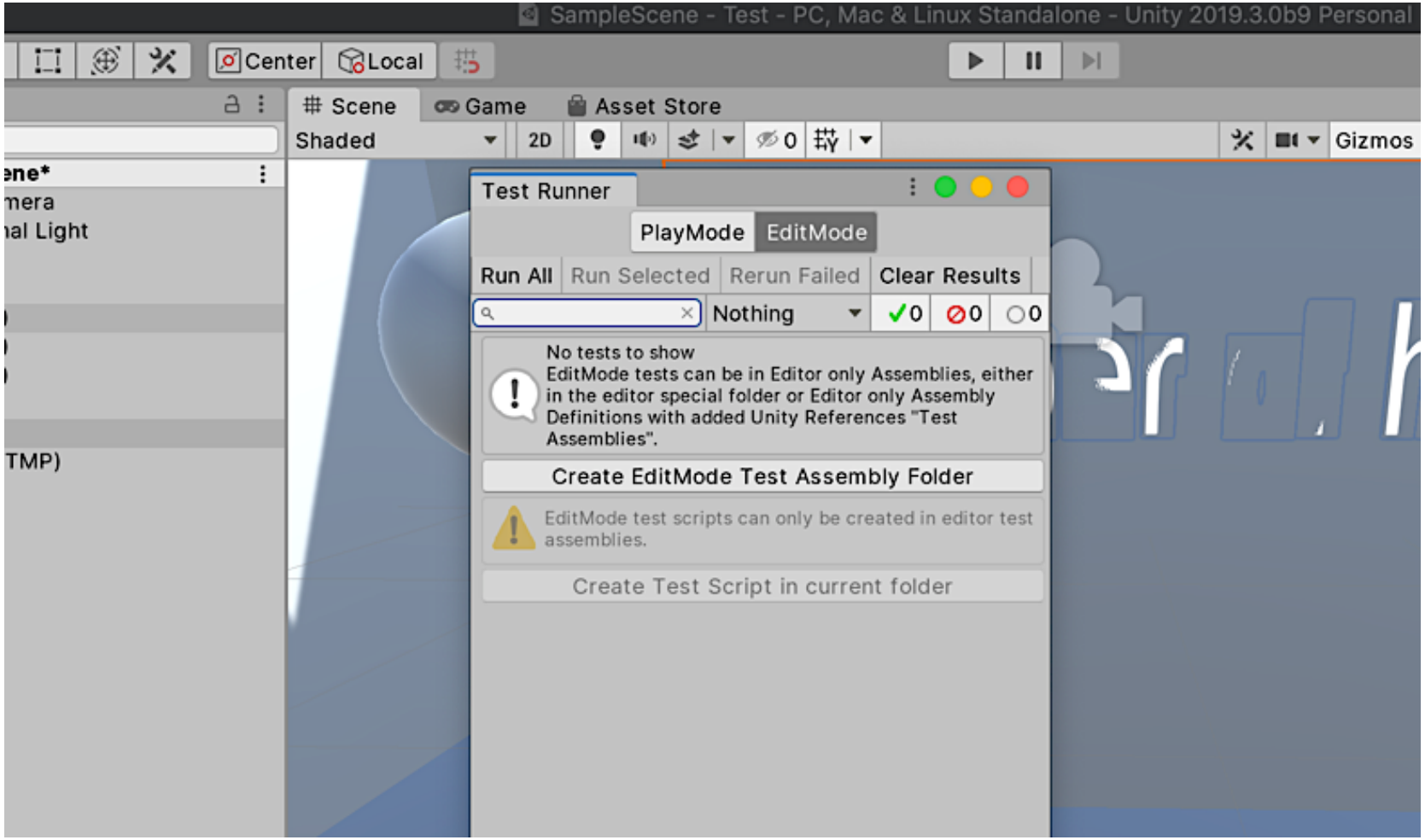
Quiz time!

What's wrong with this app?

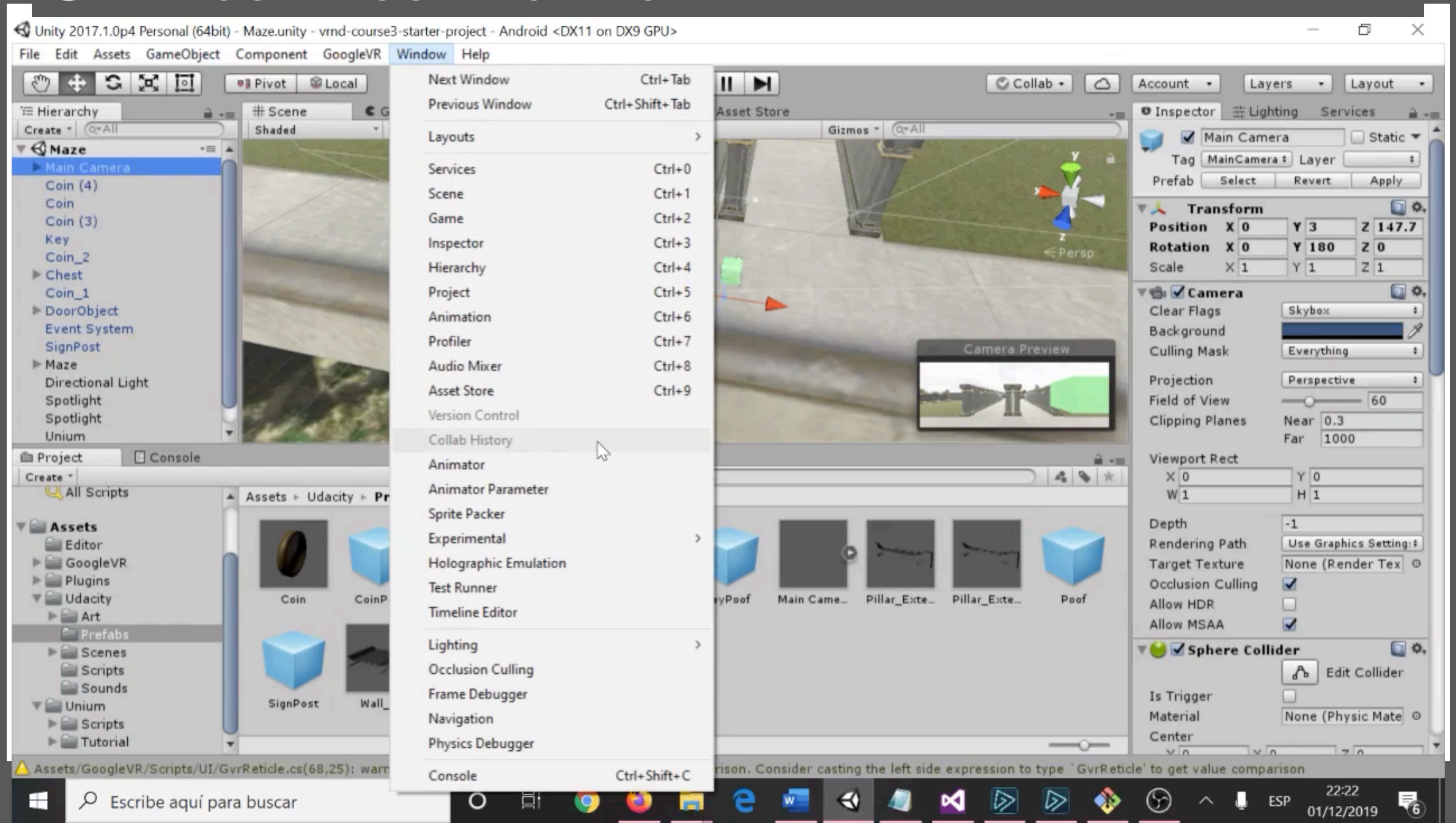
What’s wrong with this app?



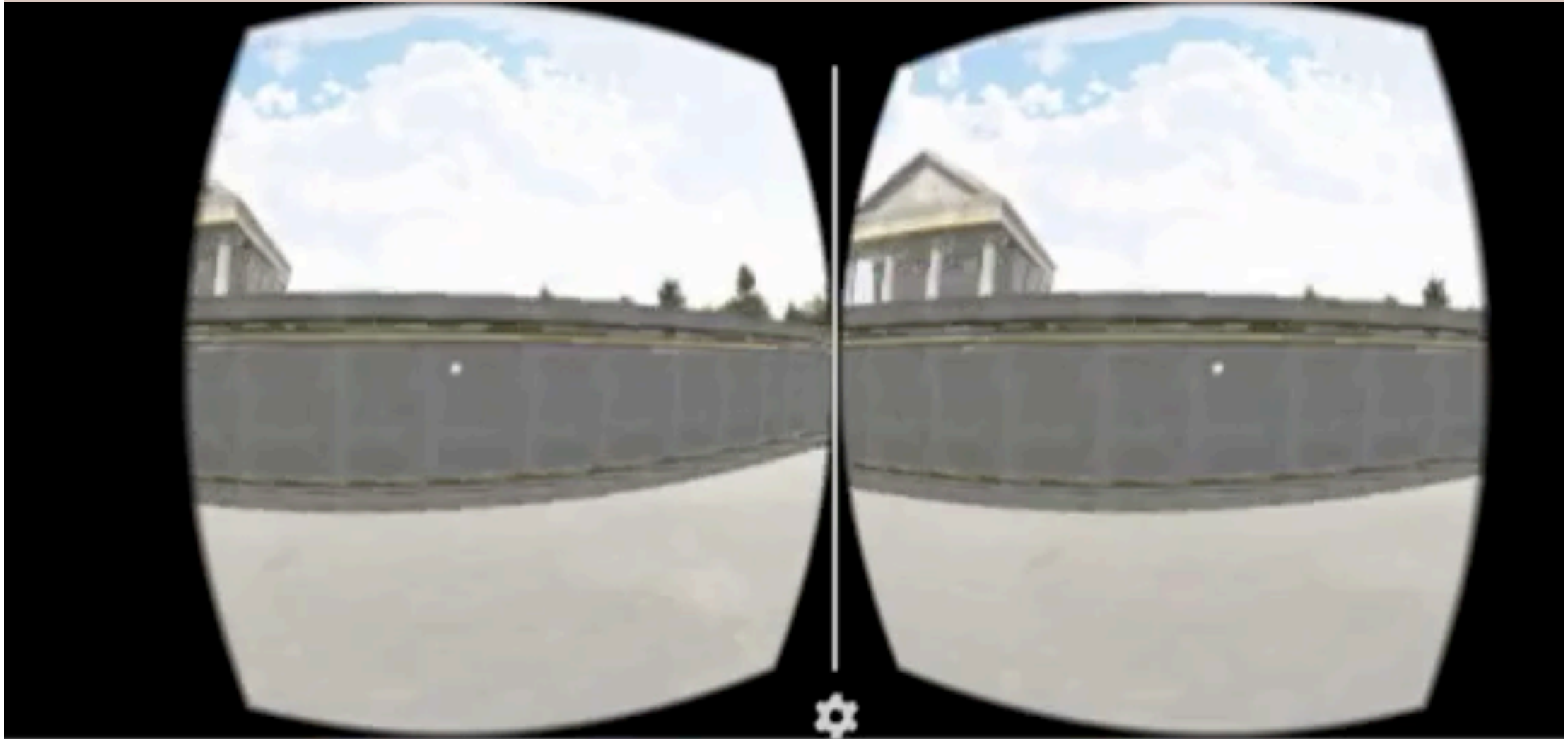
Unit test: Test Runner



Unit test: Test Runner



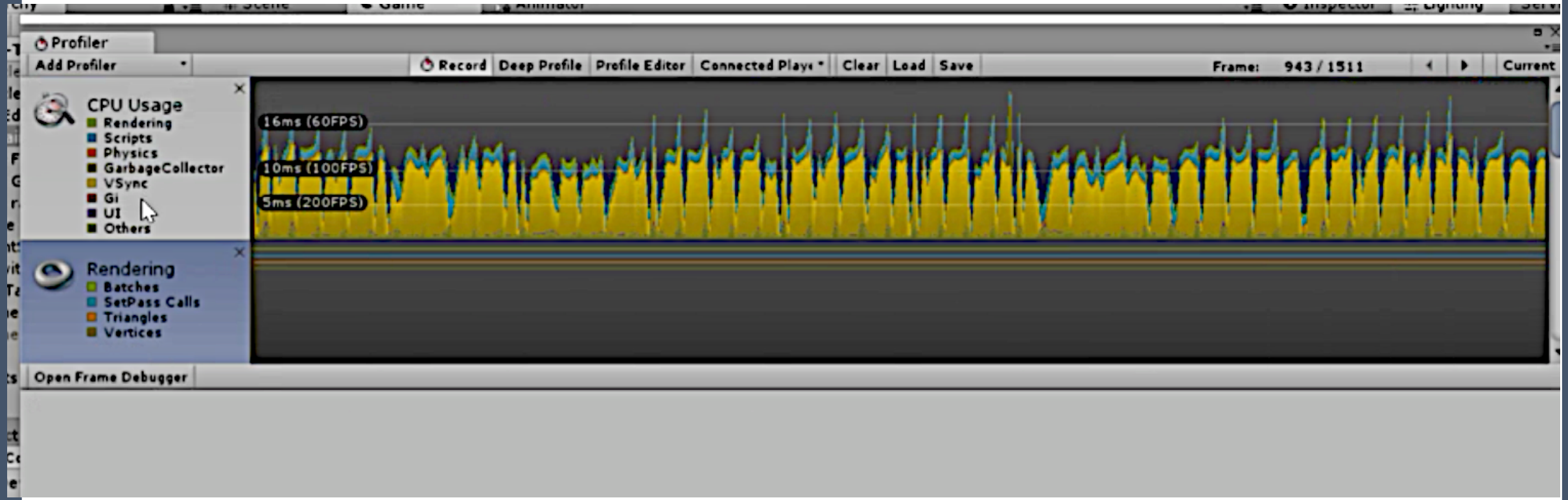
Fixed!



What’s wrong with this app?

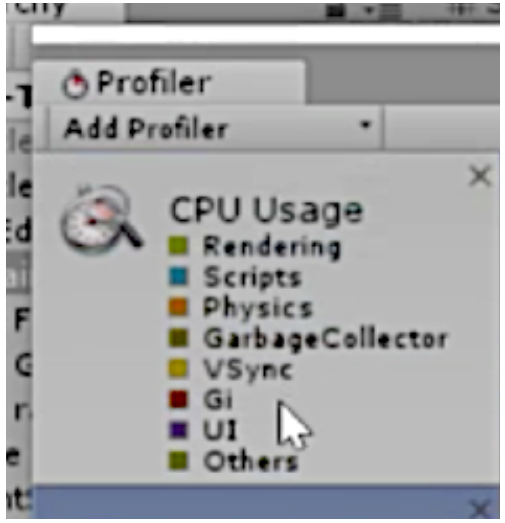
Hand simulator played by Markiplier (+ friends) https://www.youtube.com/watch?v=M7qy2FBs7bw

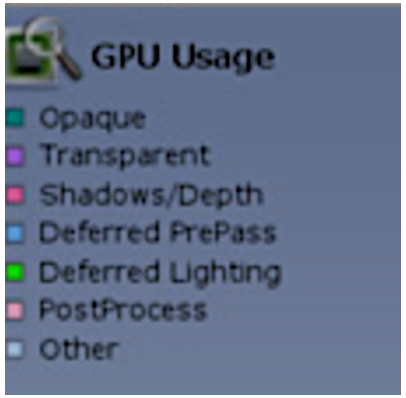
Performance tests: profiler tool

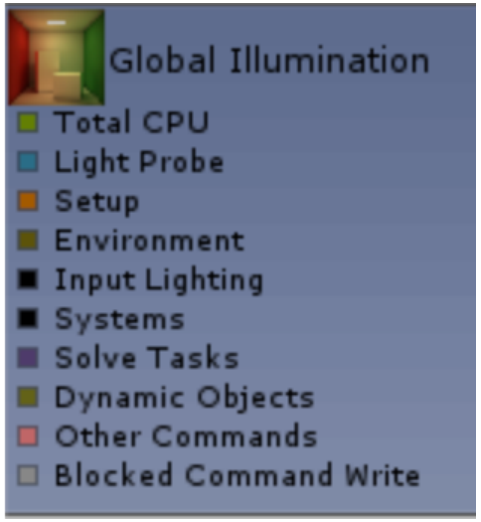


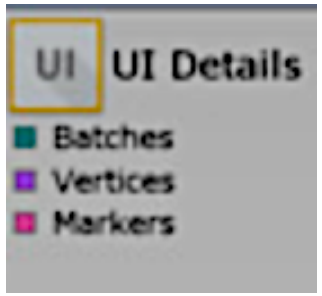
Performance tests: profiler tool

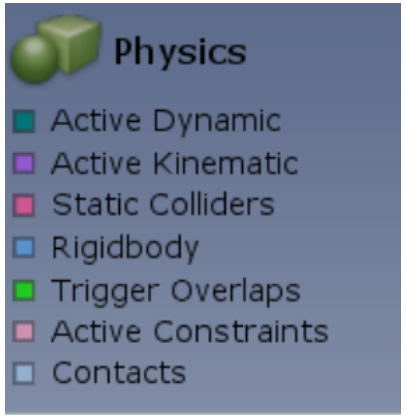
Profiler modules

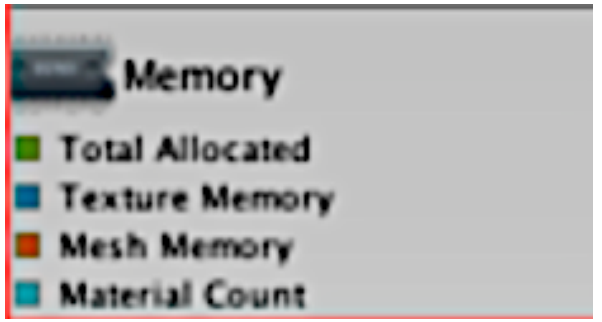






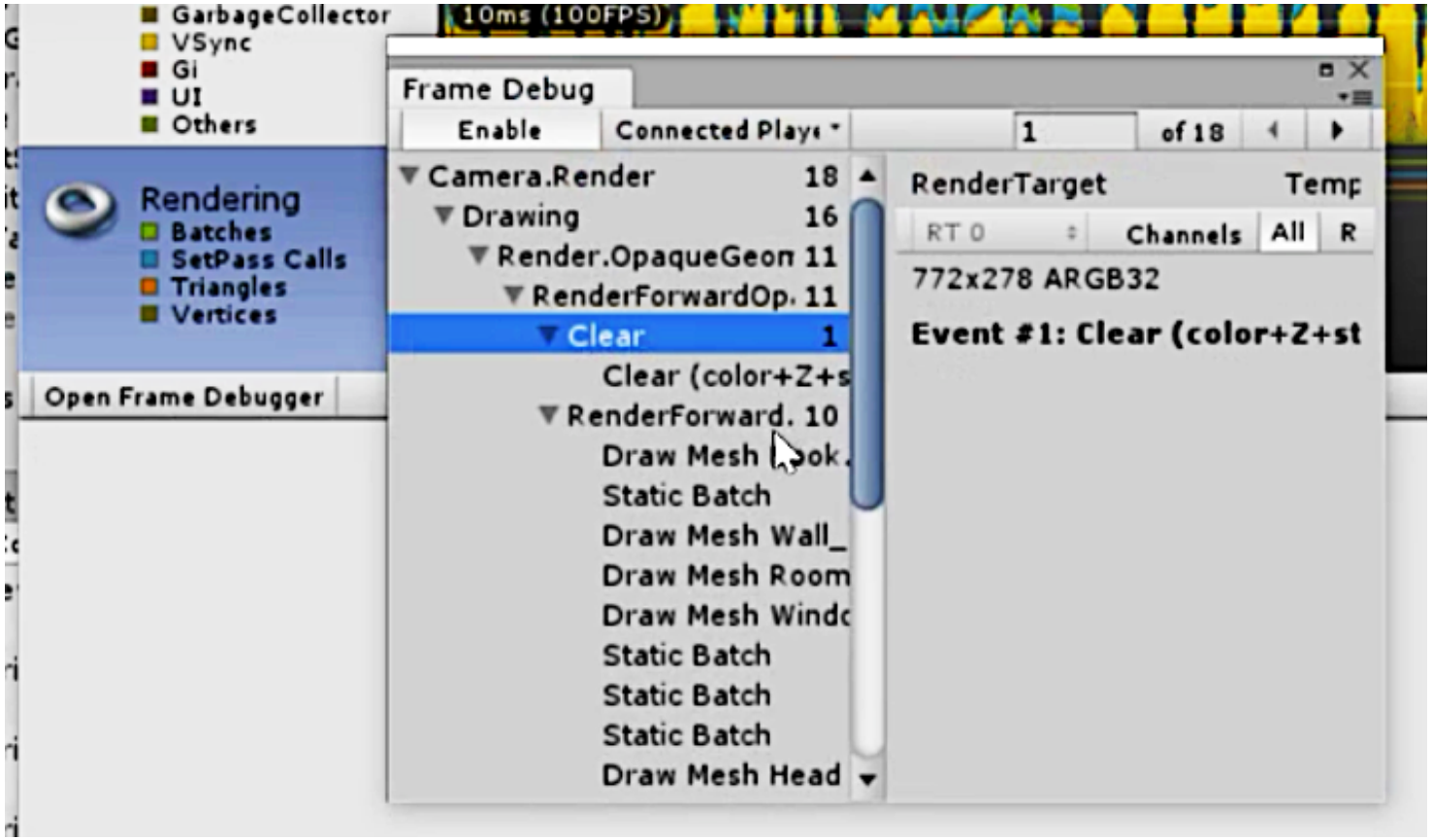






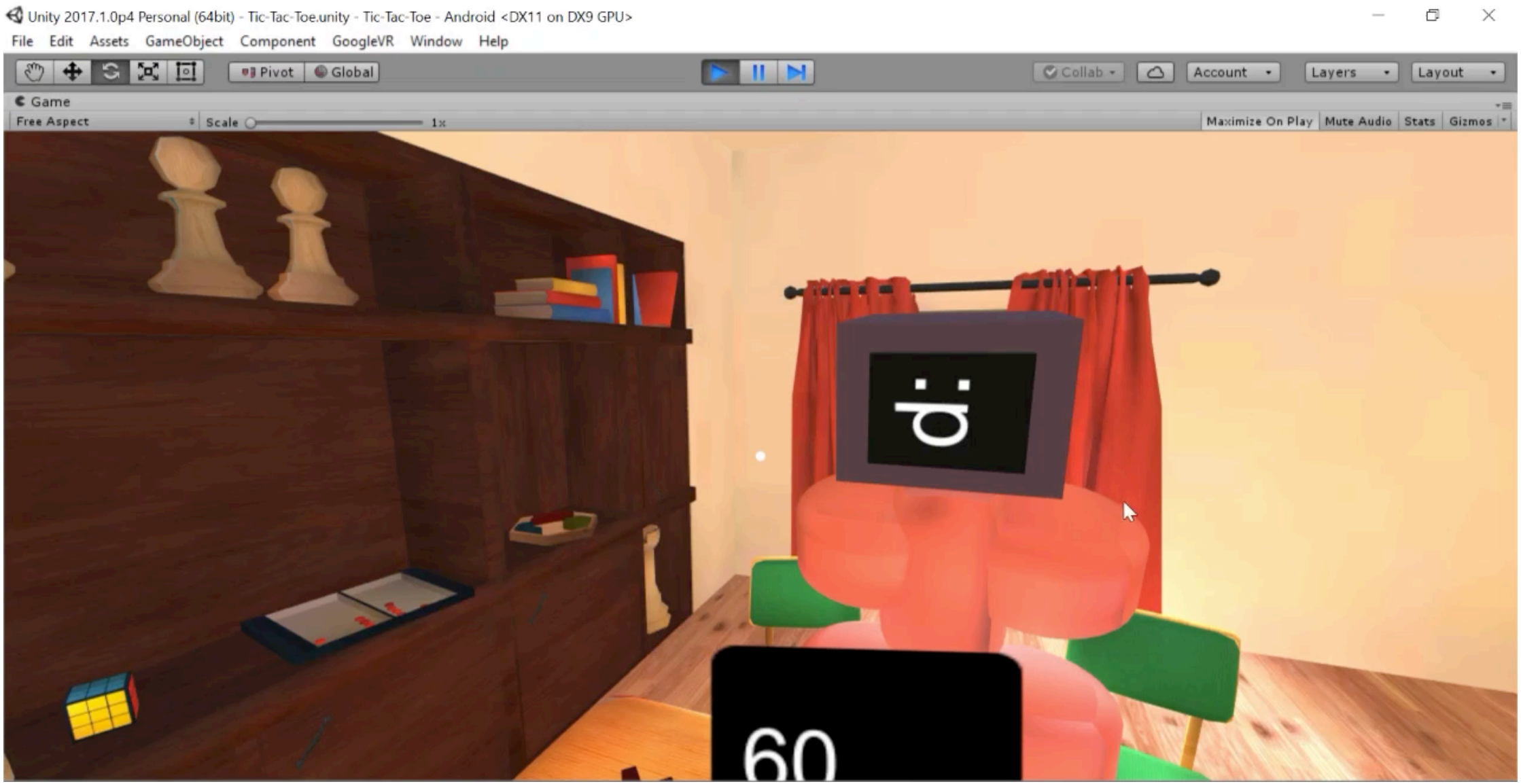
Performance tests: profiler tool

Frame debugger



Performance tests: profiler tool

Fixed!


Unity 2017.1.0p4 Personal (64bit) - Tic-Tac-Toe.unity - Tic-Tac-Toe - Android <DX11 on DX9 GPU>
File Edit Assets GameObject Component GoogleVR Window Help
Pivot Global
Collab Account Layers Layout
Game
Free Aspect Scale 1x
Maximize On Play Mute Audio Stats Gizmos
60

Performance tests:

- Some variables more important for VR (3D)
  - Scale, colours and sounds
  - Quality of material and lights
  - GPU
  - Motion sickness

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What’s wrong with this app?

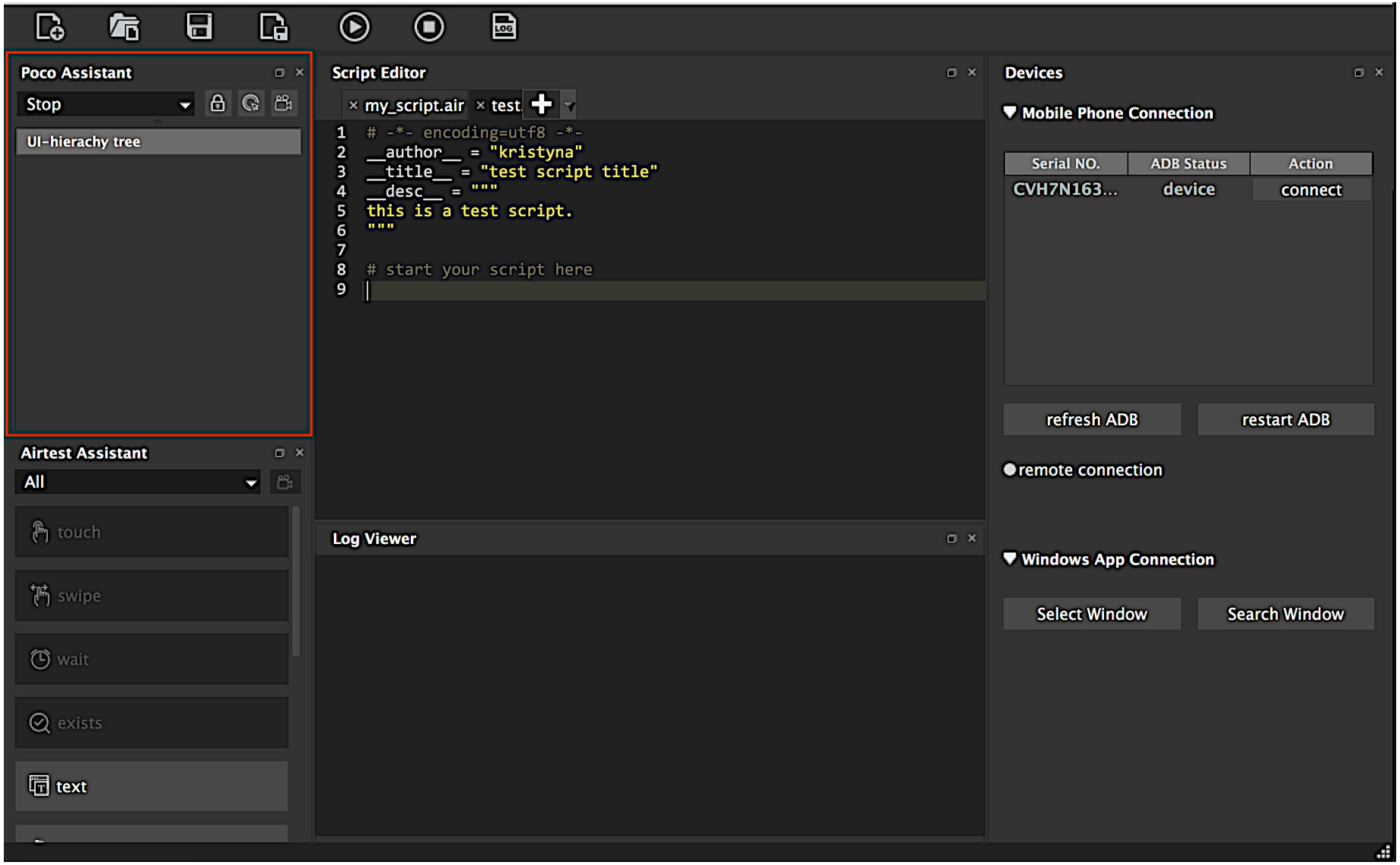
Hand simulator played by Markiplier (+ friends) https://www.youtube.com/watch?v=M7qy2FBs7bw

Automation: POCO (airtest project / netease)

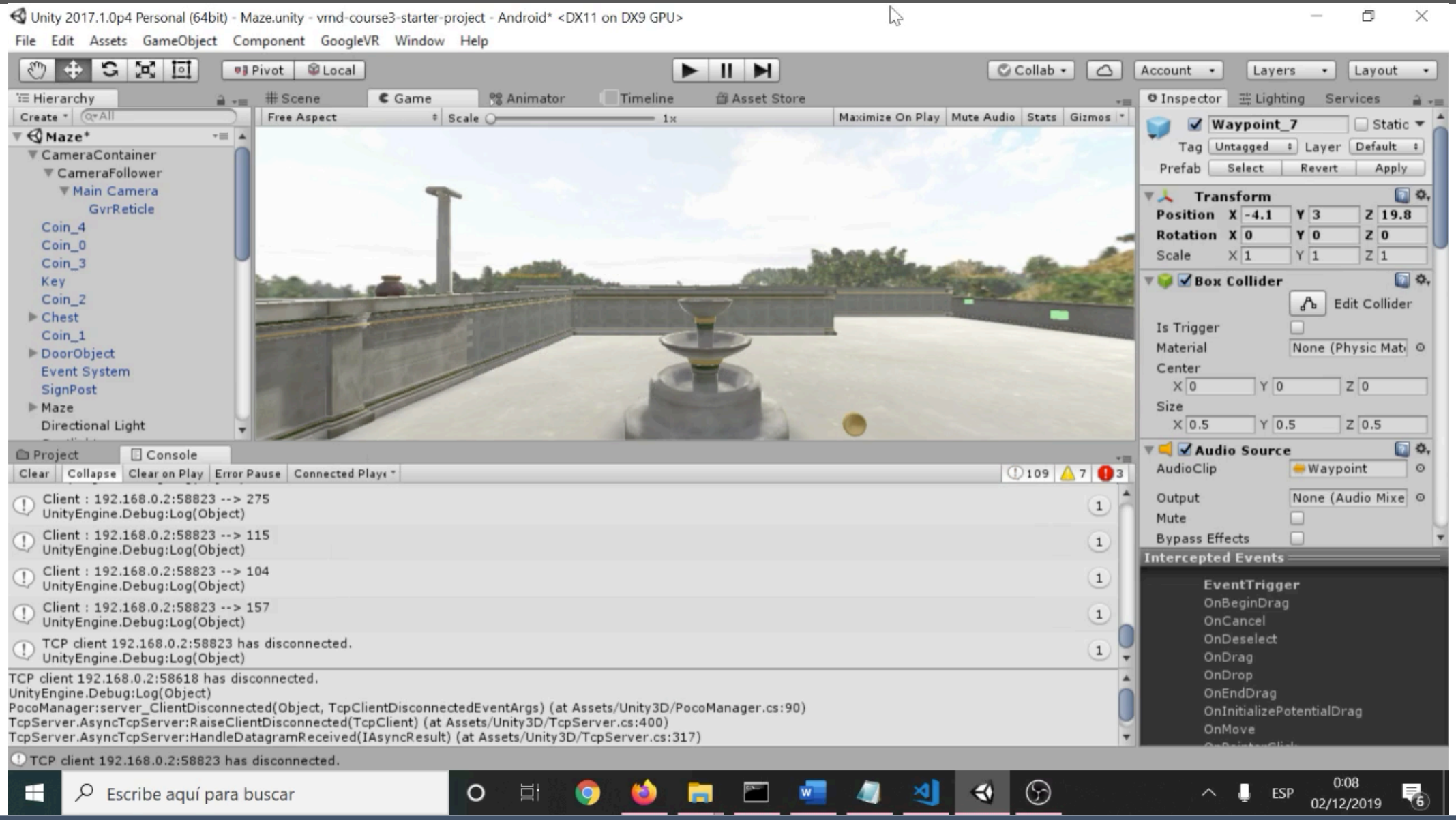
For cardboard VR support

https://poco.readthedocs.io/en/latest/source/doc/unity3d_vr.html

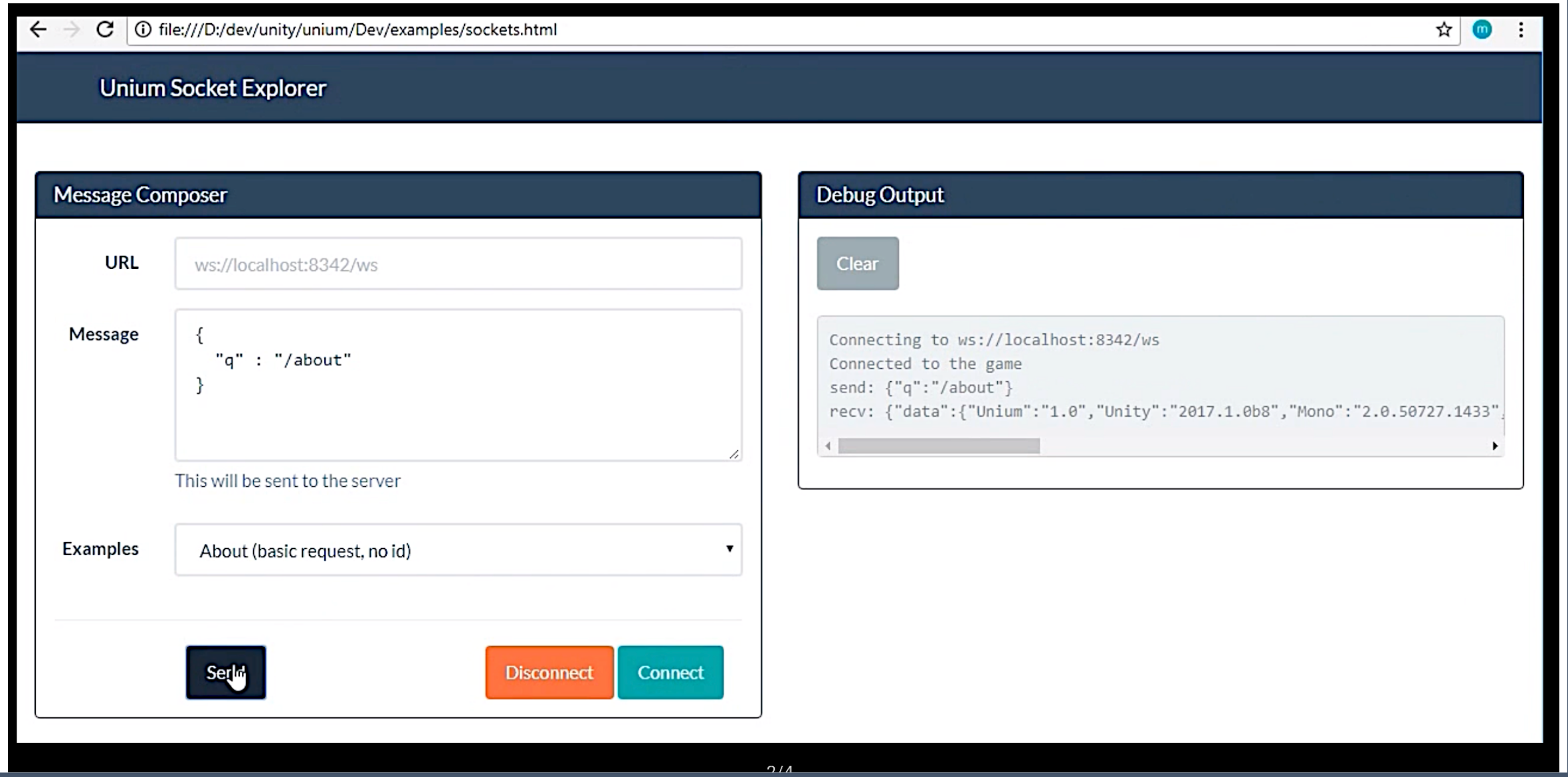
https://github.com/AirtestProject/Poco-SDK



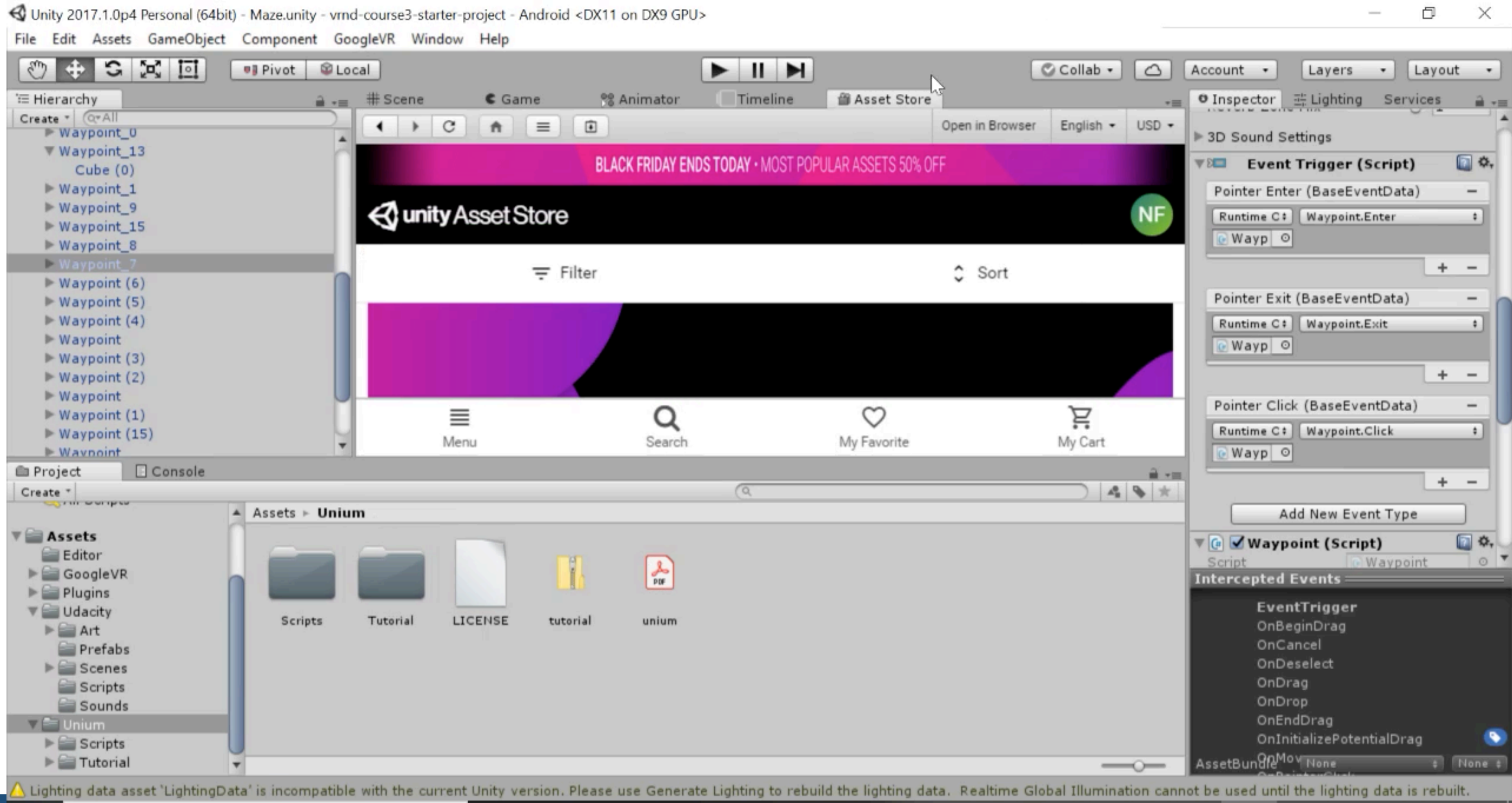
Automation: PocoUI in action



Automation: Unium



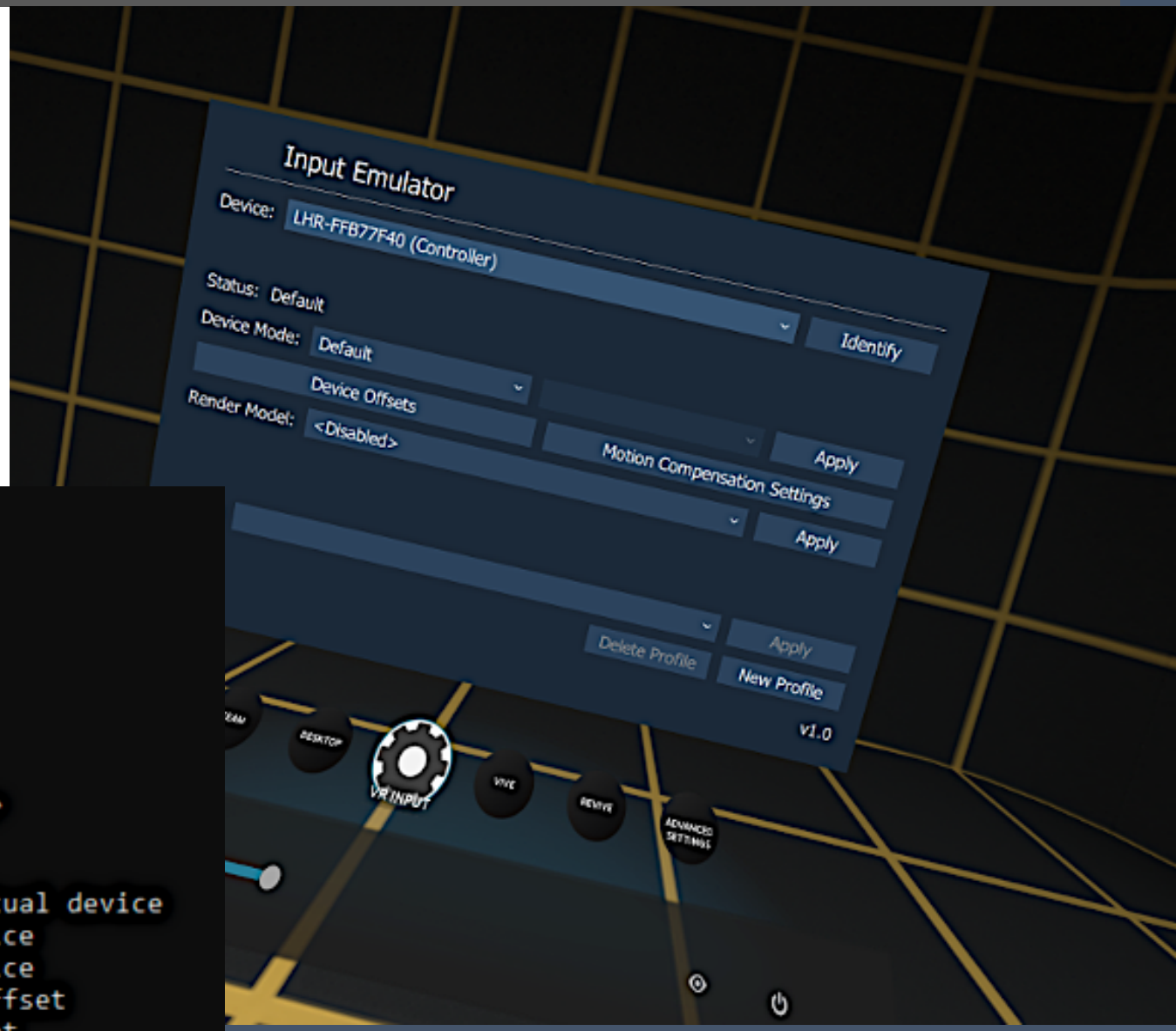
Automation: Unium in action



Automation: OpenVR-InputEmulator

Emulate devices

https://github.com/matzman666/OpenVR-InputEmulator/




```
vailable commands (enter "<command> help" for help):

 listdevices                Lists all openvr devices
 buttonevent                Sends button event
 axisevent                  Sends axis event
 proximitysensor            Sends proximity sensor event
 getdeviceproperty          Returns a device property
 listvirtual                Lists all virtual devices
 addcontroller              Creates a new virtual controller
 publishdevice              Adds a virtual controller to openvr
 setdeviceproperty          Sets a device property
 removedeviceproperty       Removes a device property
 setdeviceconnection        Sets the connection state of a virtual device
 setdeviceposition          Sets the position of a virtual device
 setdevicerotation          Sets the rotation of a virtual device
 devicetranslationoffset    Configure the device translation offset
 devicerotationoffset       Configure the device rotation offset
 benchmarkipc               ipc benchmarks
```

Automation: Conclusions

- 2 types of automation: hardware and software
- Platform dependent
- Tools to be discovered
- VR objects rotation not as straight forward (quaternions)

What's wrong with this app?

https://www.youtube.com/watch?v=bv7I8nMV914

Other type of testing: conclusions

VR has some restrictions that we should take into account

- Accessibility testing
- Usability testing
- Cloud testing
- Security testing
- Localization testing
- Real world dangers
- Virtual assaults

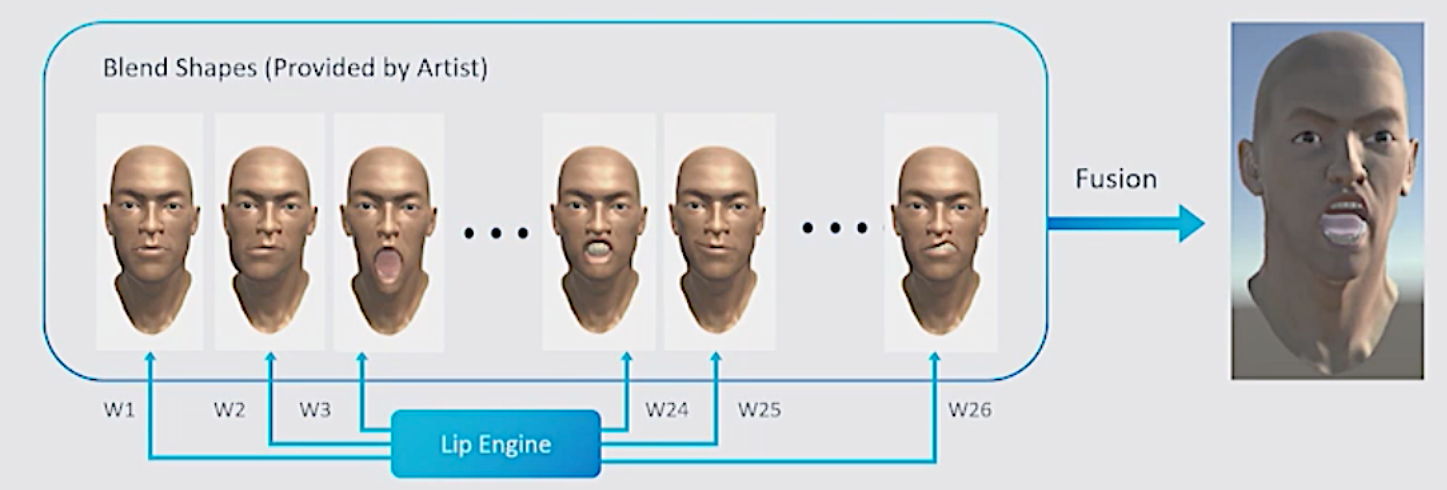
The future of VR

- MR (AR mixing with VR)

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

The future of VR

- Trackers (eyes, lips, expressions, heart, legs…)

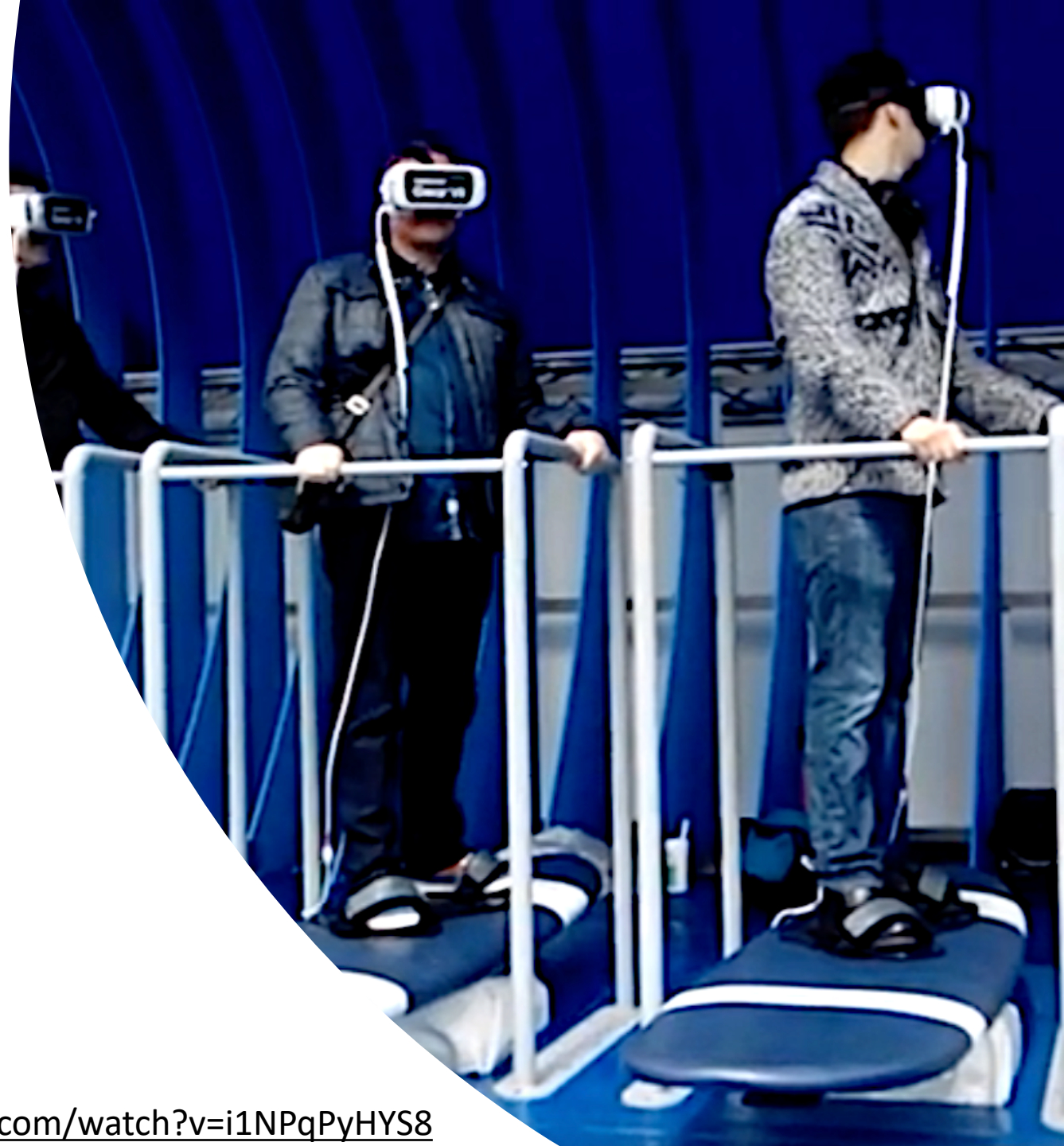


https://www.youtube.com/watch?v=lpXdHjzbauU

The future of VR

- Platforms (running/walking/surfing/snowboard…)
- https://www.youtube.com/watch?v=6Jb3W1QZVaE (2017)
- https://www.youtube.com/watch?v=qh2UdRKNqH4 (2016)
- https://www.youtube.com/watch?v=i1NPqPyHYS8 (2016)

- Better position detection on the headsets + detection of the environment



https://www.youtube.com/watch?v=i1NPqPyHYS8

The future of Virtual reality - conclusions

- Wireless
- Smaller devices
- More than just hands and head (sensory, trackers…)
- XR : bringing digital objects to real world and real world to digital objects

Photo by Lucrezia Carnelos on Unsplash

How to get started in VR?

- Events / meetings
- Watch videos / reviews
- Games / apps
- Courses
- Play with it!

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Thank you!

Noemi Ferrera

- @thetestlynx
- Blog: noemiferrera.com
- Github.com/thetestlynx

VR devices: single

Daydream view https://arvr.google.com/daydream/

Google Daydream View - VR Headset (Slate)

★★★★☆ 239

$49.99 ~~$59.95~~

More Buying Choices

$34.42 (19 used & new offers)

Oculus Go Standalone Virtual Reality Headset - 32GB

May 1, 2018 | by Oculus

★★★★☆ 1,687

Oculus

$199.00

Ships to Germany

More Buying Choices

$168.00 (19 used & new offers)

Lenovo Mirage Solo with Daydream, Sta
QHD Display, Smartly Designed Mobile

May 5, 2018 | by Lenovo

★★★☆☆ 76

Android

$299.89 ~~$399.99~~

Ships to Germany

More Buying Choices

$198.49 (21 used & new offers)

VR devices: with handset

Available now

$39.99 MSRP*

Buy now

For the first time ever, you and your family can try making, playing, and discovering together with Nintendo Labo through a value-priced Starter Set. Combine DIY fun with simple, shareable VR, plus a new programming tool you can use to make your own quick play VR games and experiences! Feel your creations come to life as you and your family blast through an alien invasion, test your skills at competitive hippo feeding, and go wherever else your imagination takes you.

Expansion Sets

EVERYONE 10+ Fantasy Violence

Oculus Quest All-in-one VR Gaming Headset – 64GB

ESRB Rating: Rating Pending | May 21, 2019 | by Oculus

4.5 out of 5 stars 878

Oculus

$399.00

Ships to Germany

Oculus Rift S PC-Powered VR Gaming Headset

May 21, 2019 | by Oculus

4.5 out of 5 stars 966

Windows

$399.00

Ships to Germany

More Buying Choices

$379.05 (13 used & new offers)

HTC Vive Cosmos - PC

Oct 3, 2019 | by HTC

4.5 out of 5 stars 1,942

Windows

More Buying Choices

$526.39 (47 used & new offers)