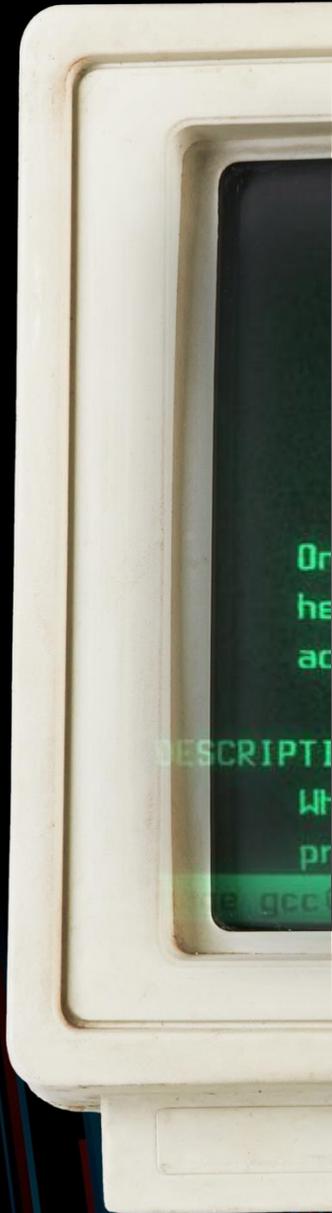




Natural User Interfaces

Vangos Pterneas



```
[-g] [-pg] [-Olevel]
[-Wwarn...] [-Wpedantic]
[-Idir...] [-Ldir...]
[-Dmacro[=defn]...] [-Umacro]
[-foption...] [-mmachine-option...]
[-o outfile] [@file] infile...
```

Only the most useful options are listed here; see below for the remainder. g++ accepts mostly the same options as gcc.

DESCRIPTION

When you invoke GCC, it normally does preprocessing, compilation, assembly and

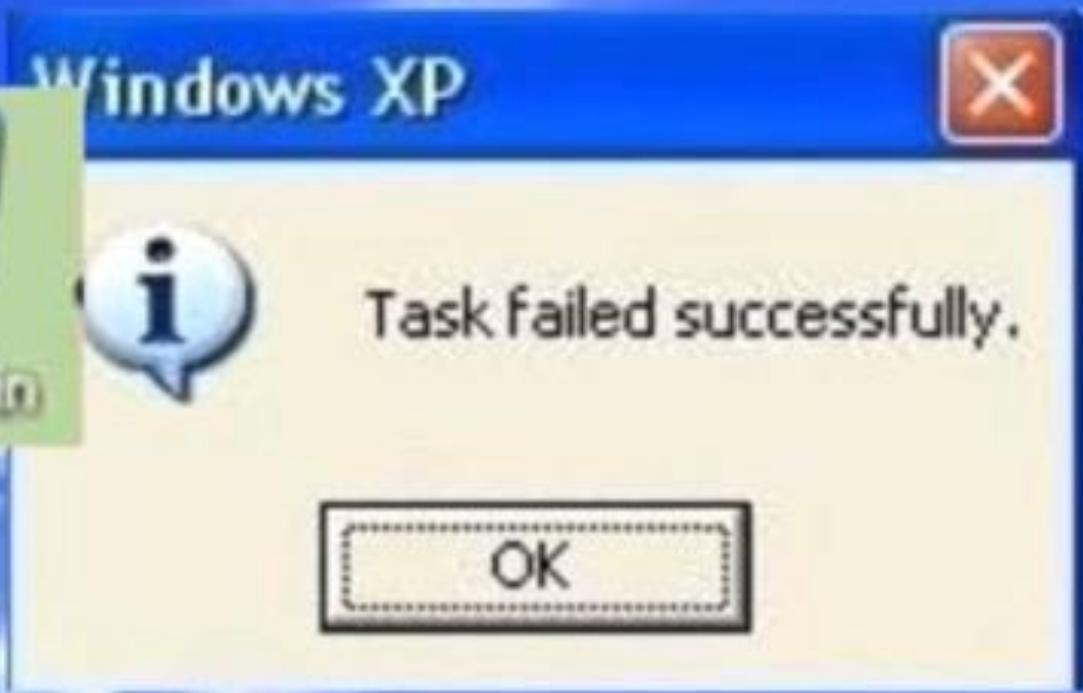
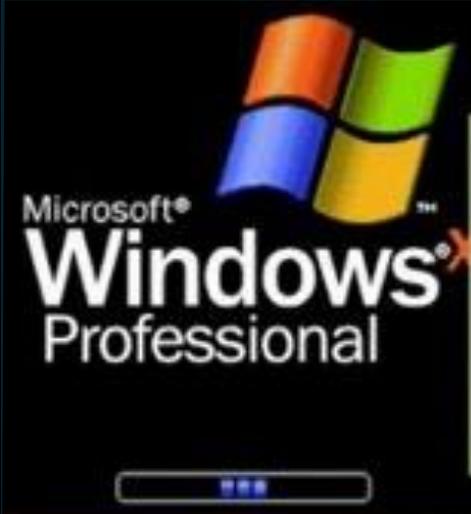
the gcc(1) line 10 (press h for help or q to quit)

Personal computers

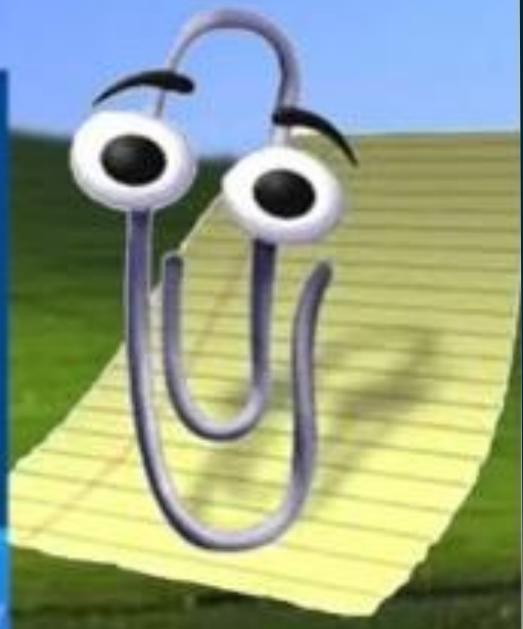
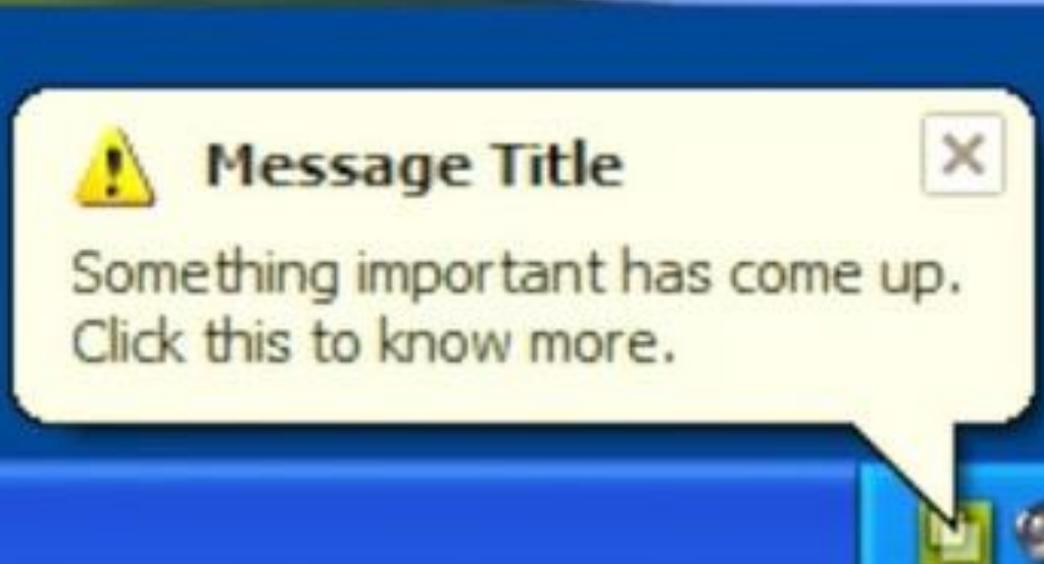


Personal computers



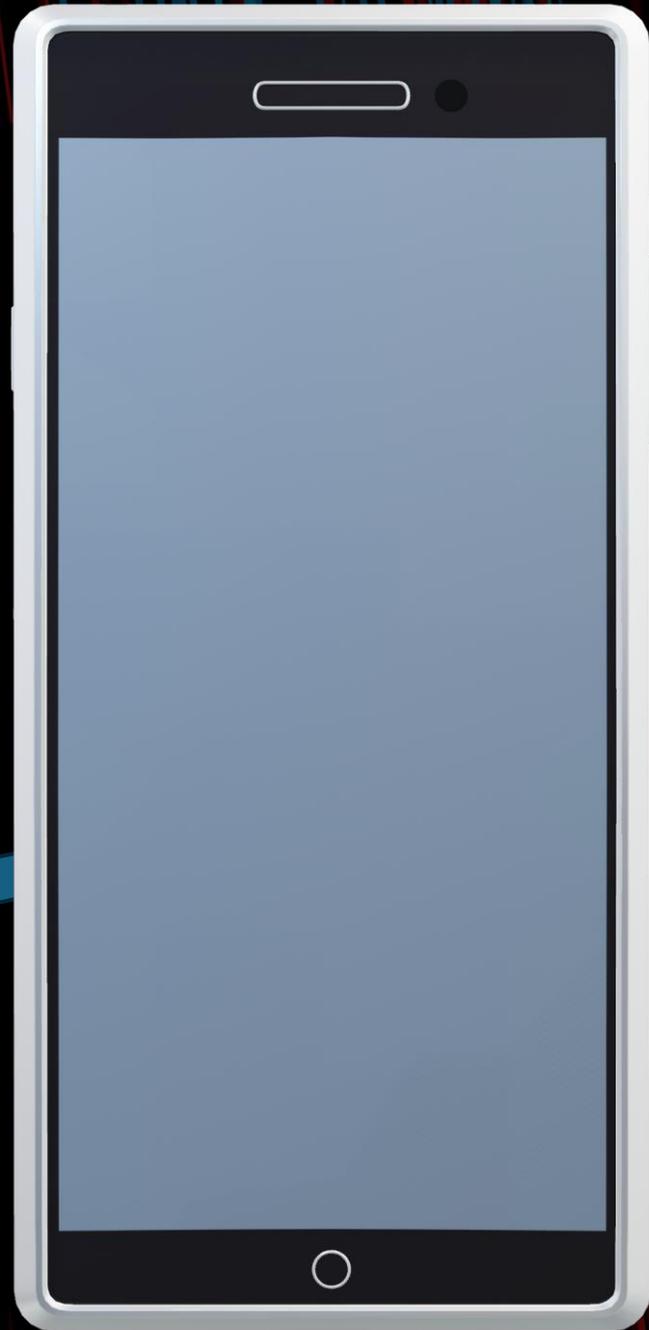


...en detected and Windows has been shut down to prevent damage
...
...VOLUME
...rst time you've seen this error screen,
...puter. If this screen appears again, follow
...re any new hardware or software is properly installed.
...installation, ask your hardware or software manufacturer
...updates you might need.
...inue, disable or remove any newly installed hardware
...able BIOS memory options such as caching or shadowing.
...se Safe Mode to remove or disable components, restart
...ress F8 to select Advanced Startup Options, and then
...ation:
...0ED (0x80F12808, 0xc000009c, 0x00000000, 0x00000000)





Mobile Devices



Mobile Devices



Mobile Hybrid Devices



Mixed Reality Headsets





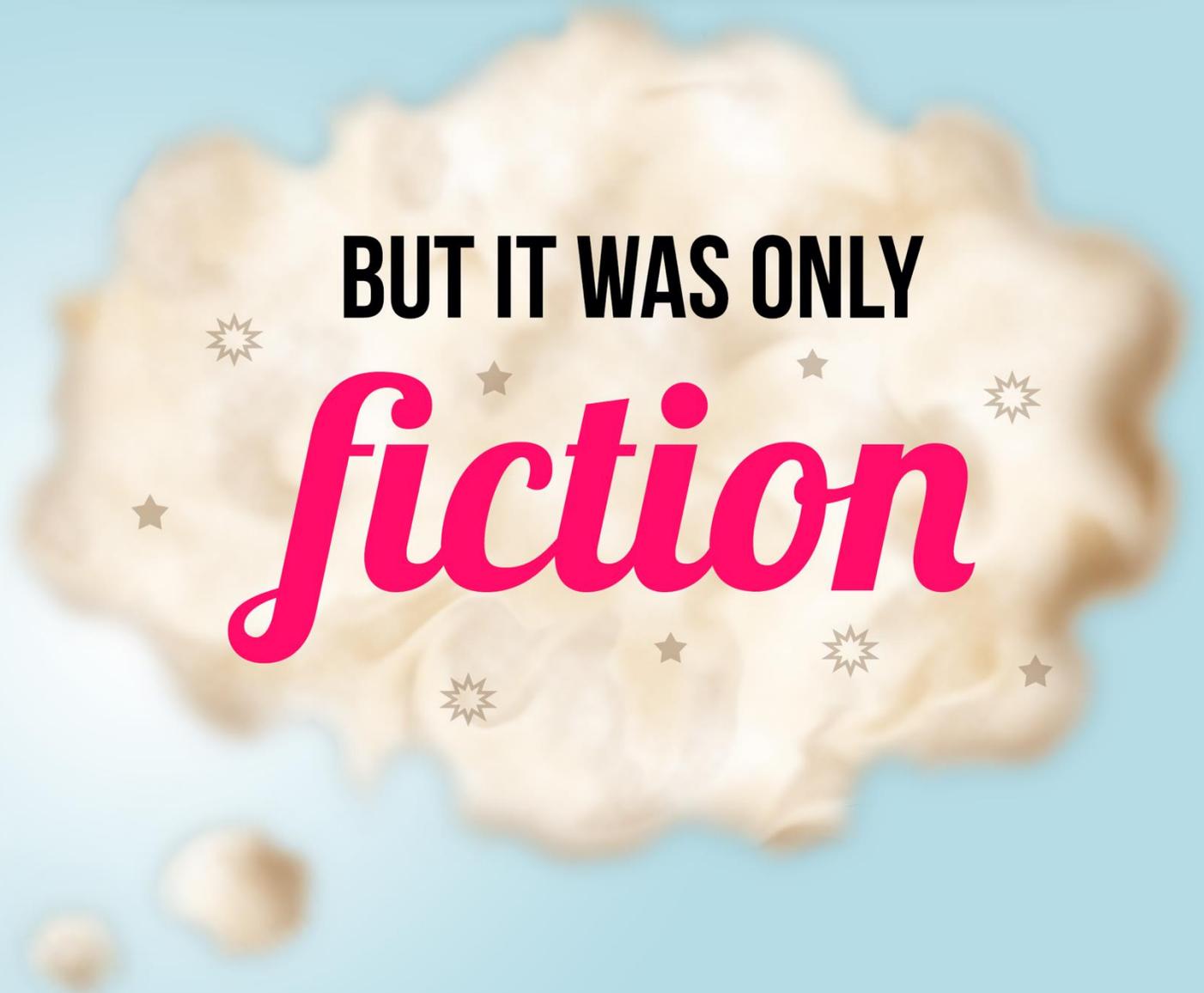
MEANWHILE, YOU SAW THIS!

...AND THIS!





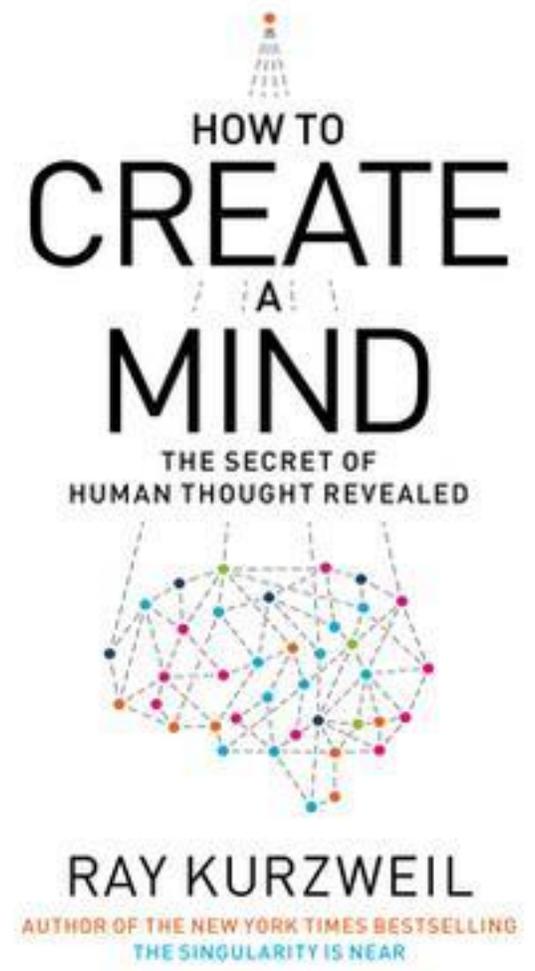
BUT IT WAS ONLY
fiction



SAY HELLO TO

NATURAL USER INTERFACES

OR...



SENSORS



SENSORS EVERYWHERE

0

1920

1080

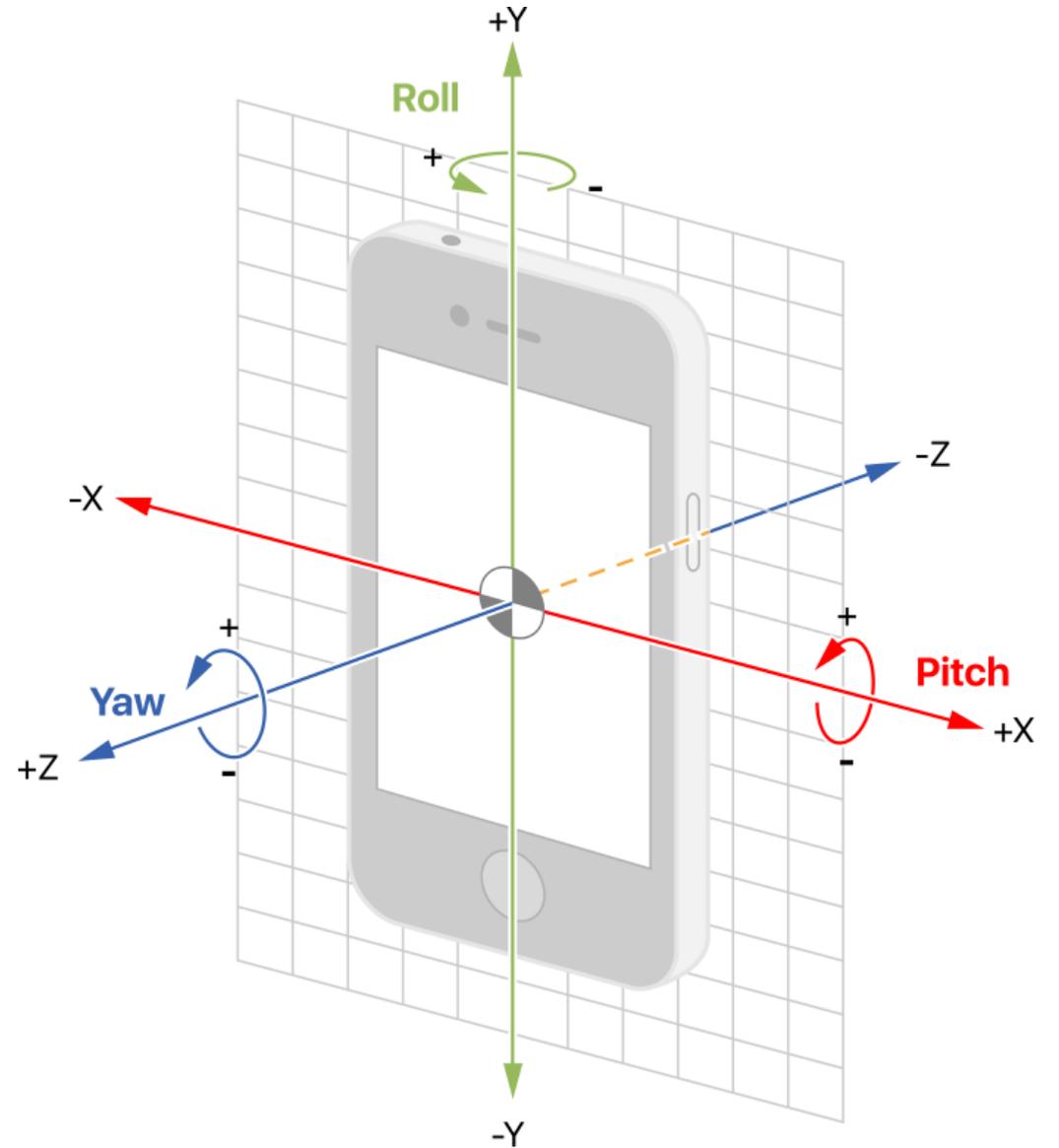




B: 85
G: 98
R: 168
A: 255



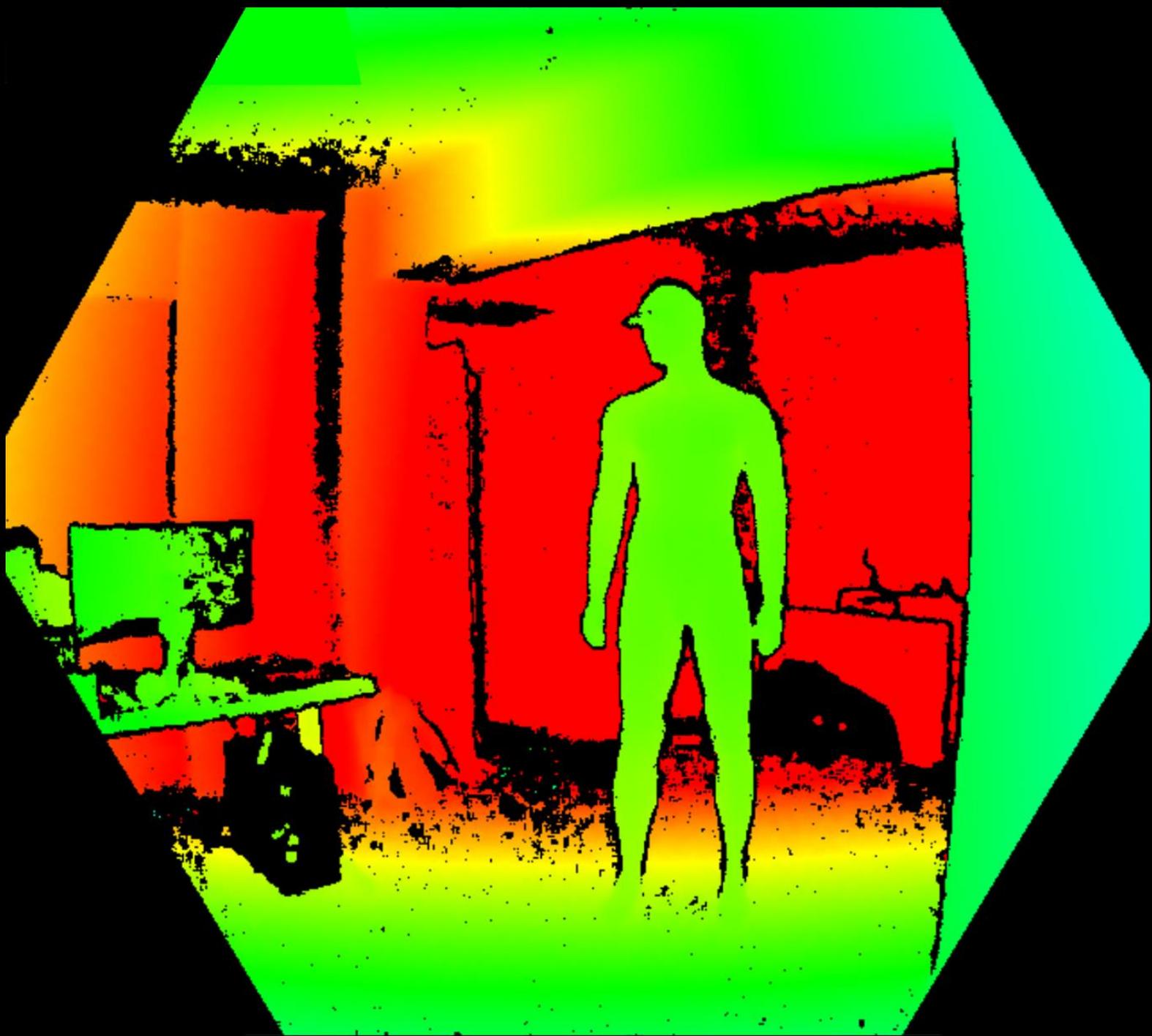
ACCELEROMETER
GYROSCOPE
MAGNETOMETER

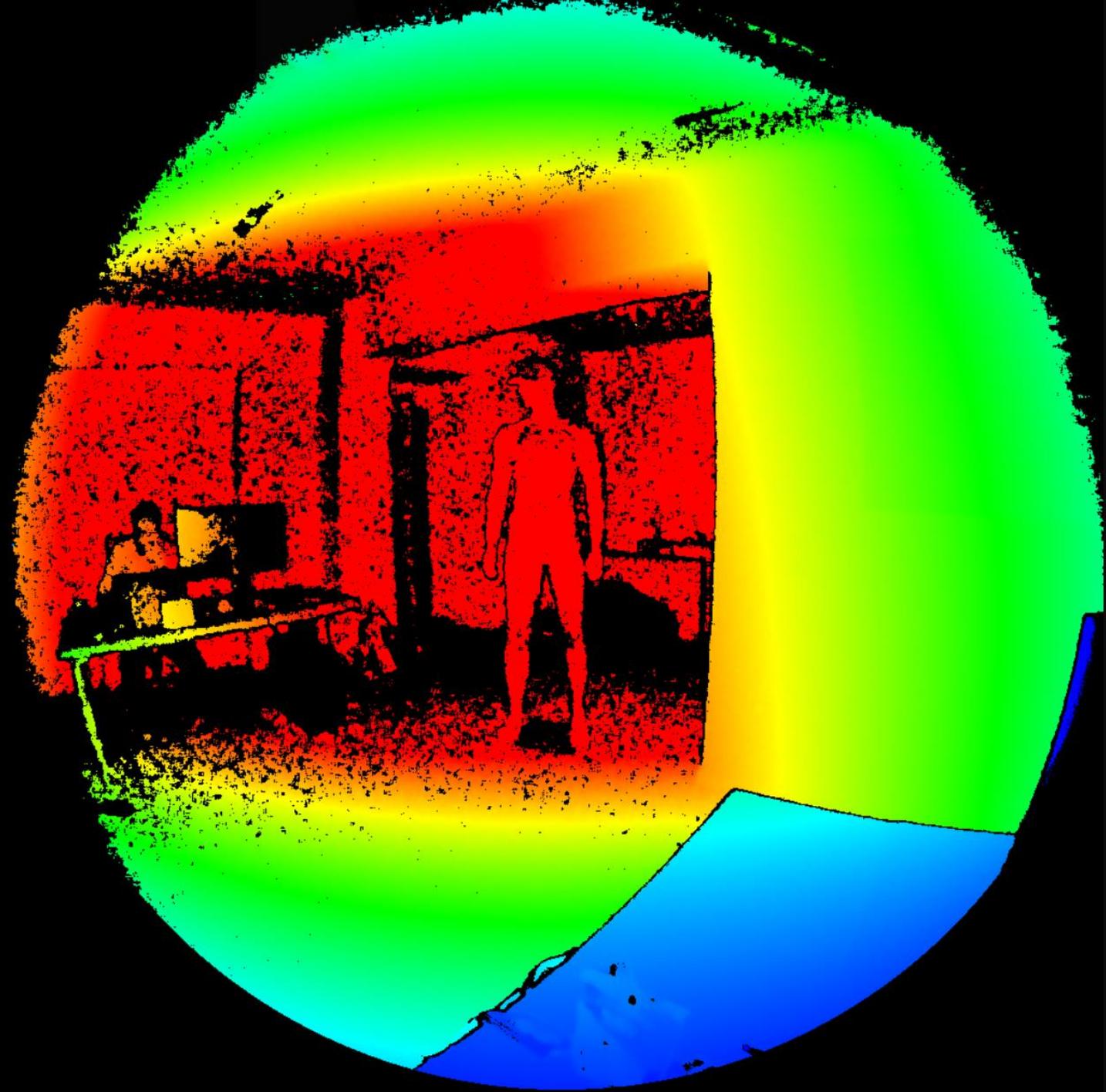


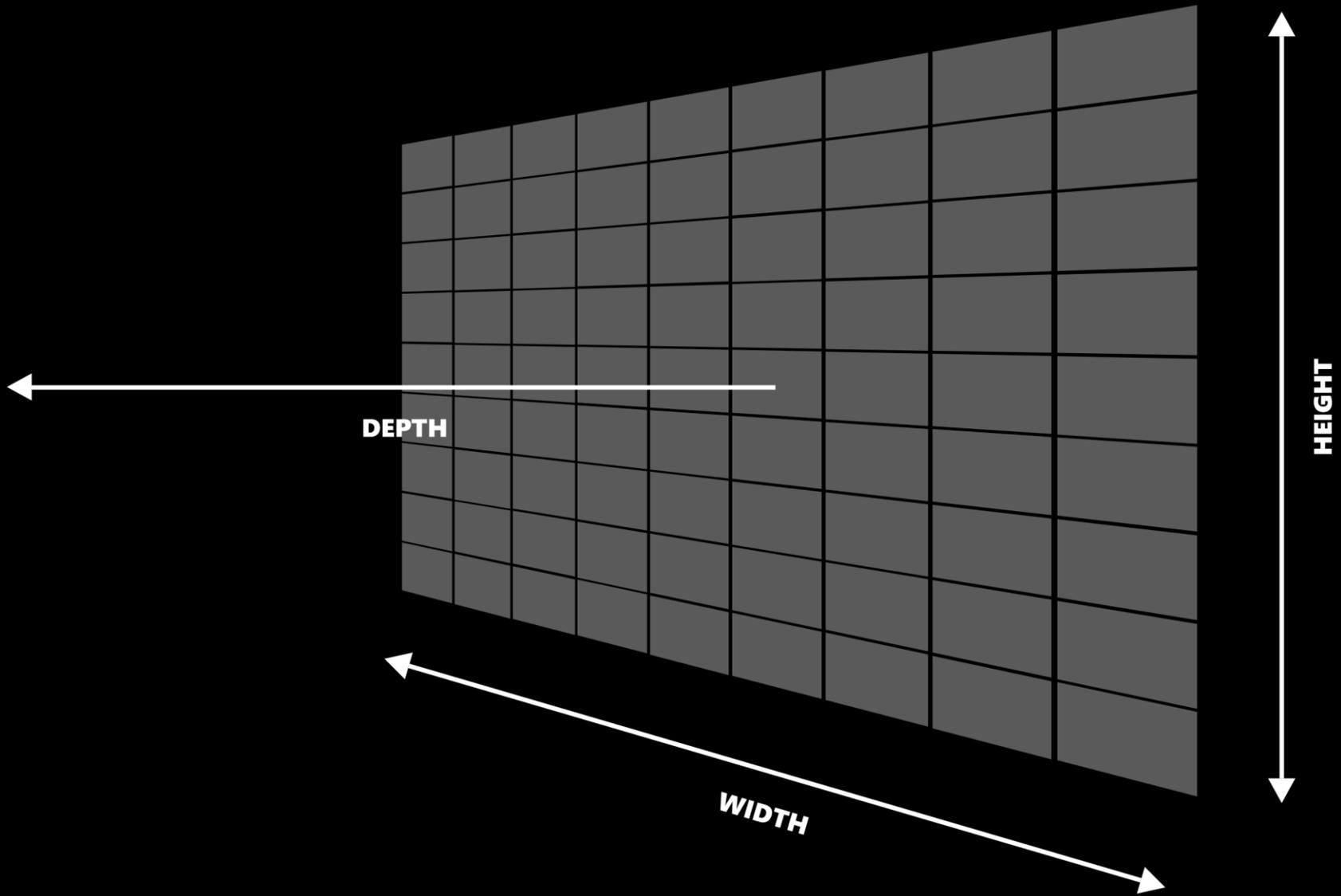
DEPTH
PERCEPTION

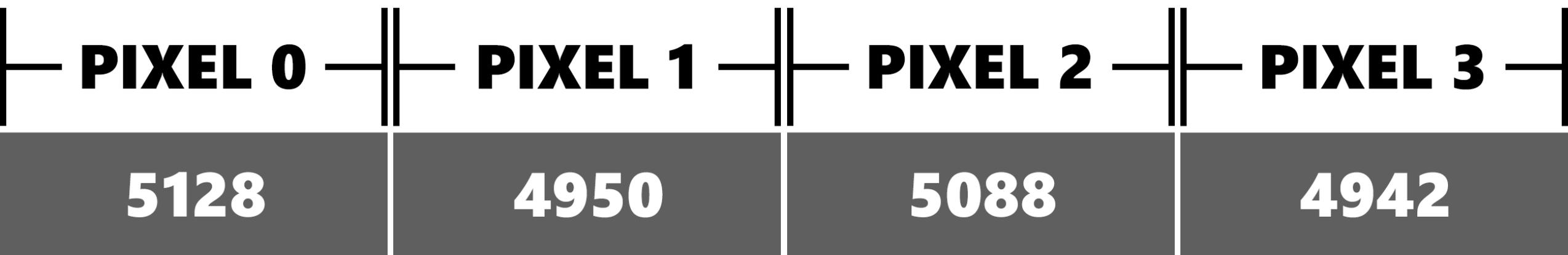
DEPTH

DEPTH

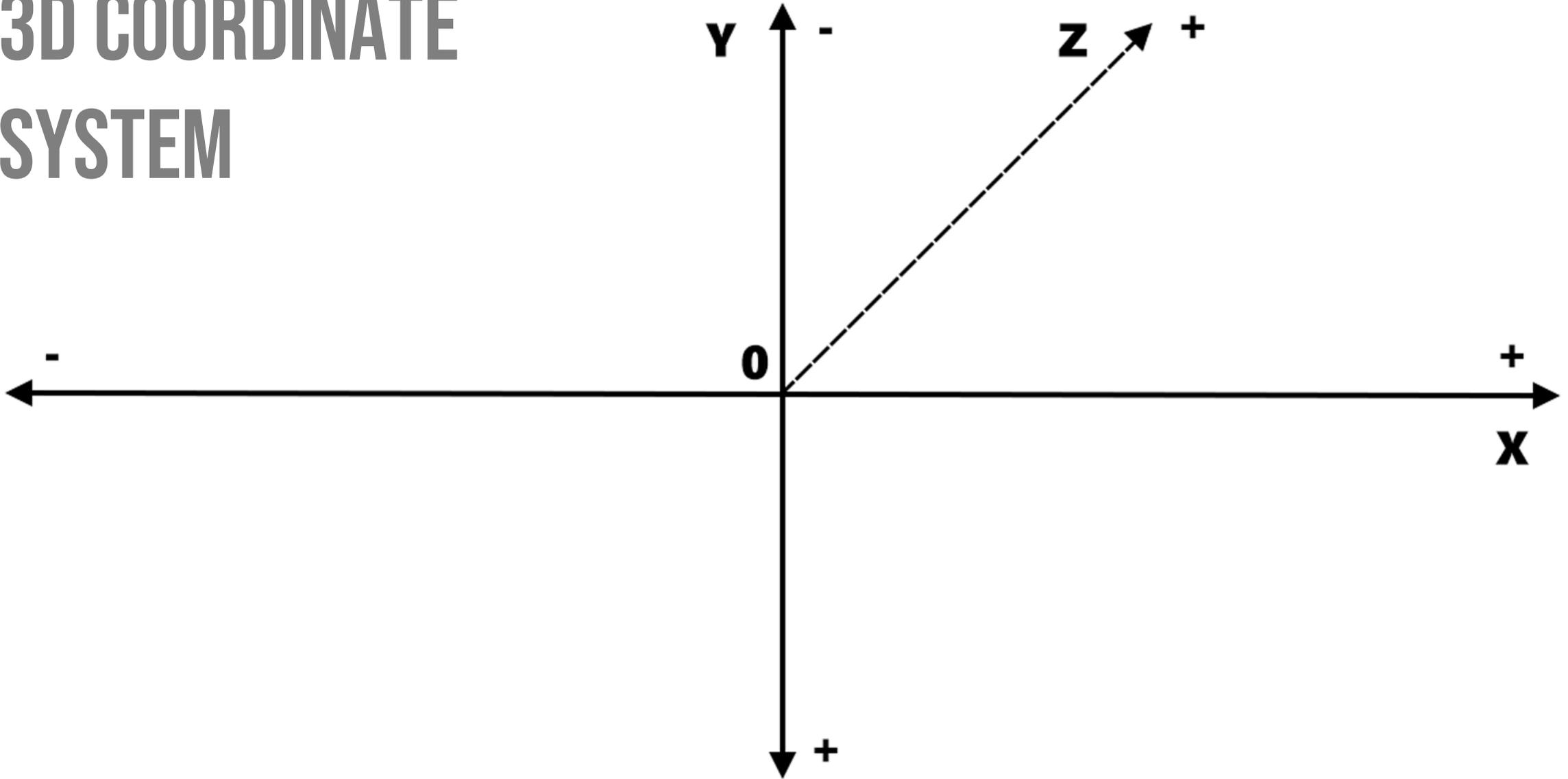








3D COORDINATE SYSTEM



THE BRAIN





car

car

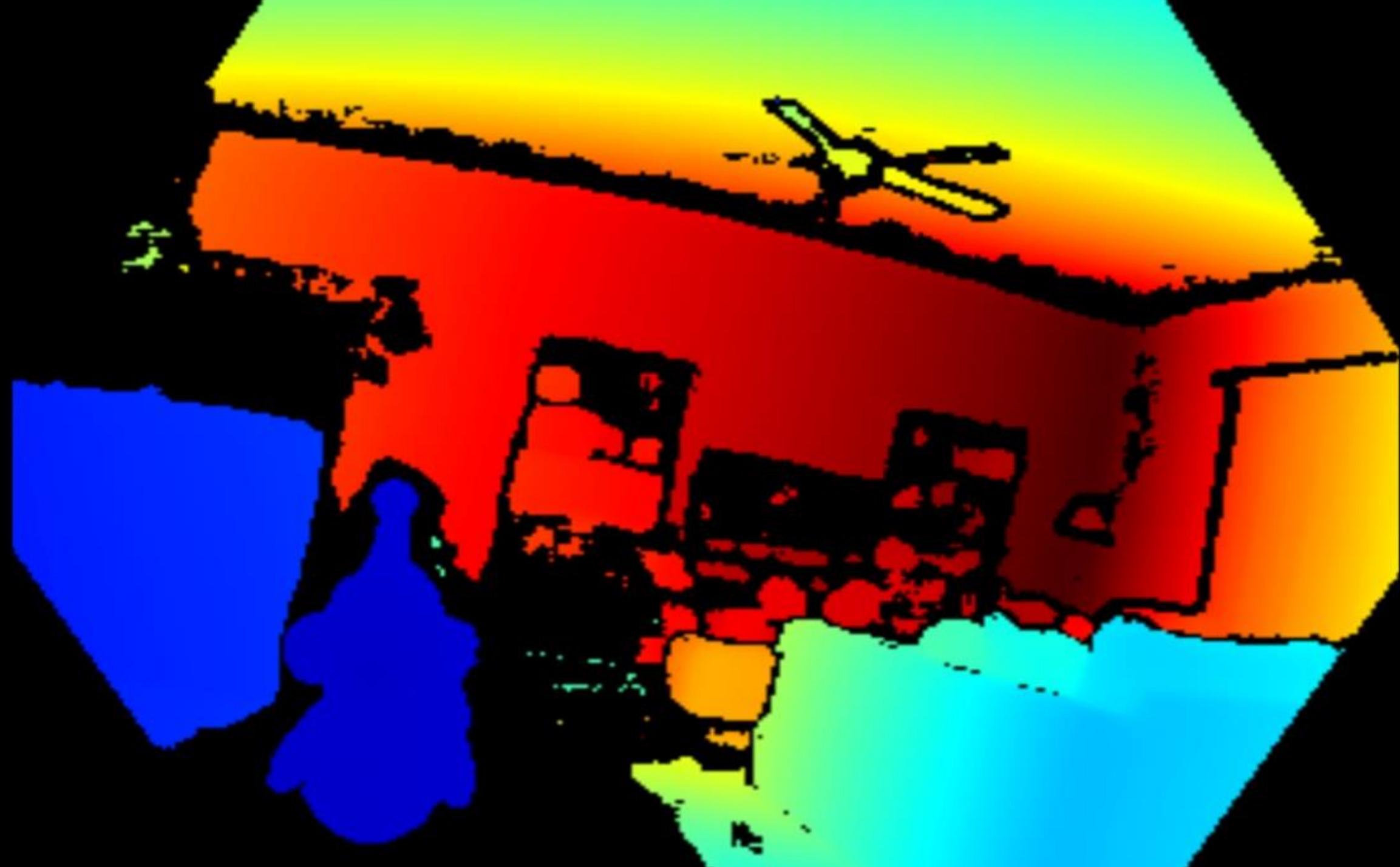
taxi

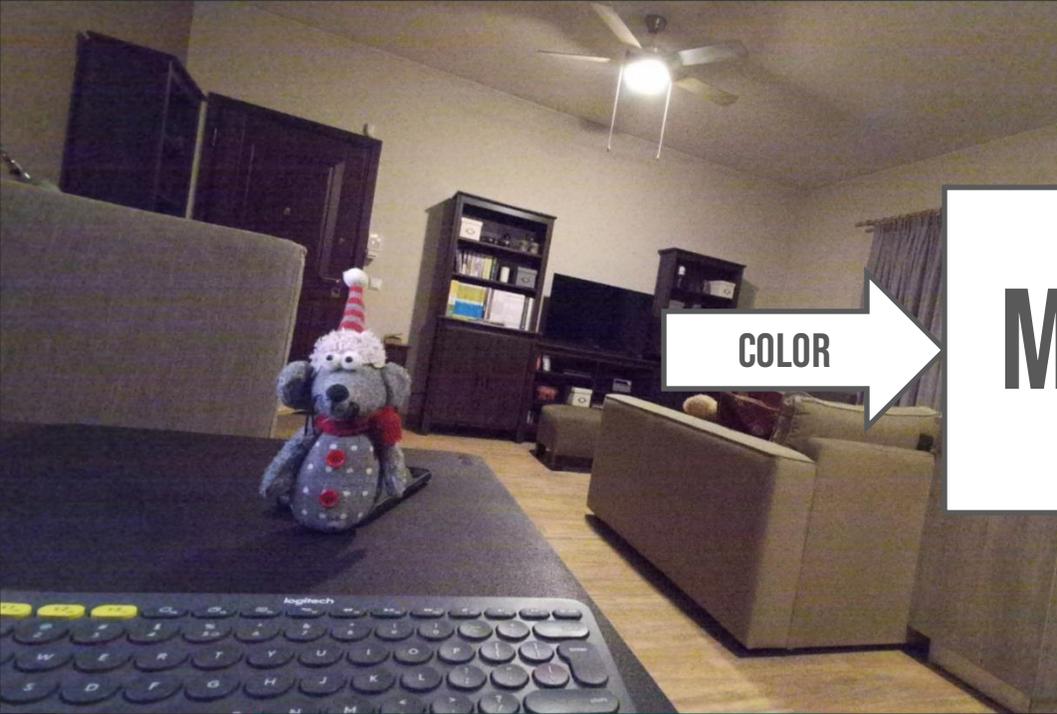
person

person

person



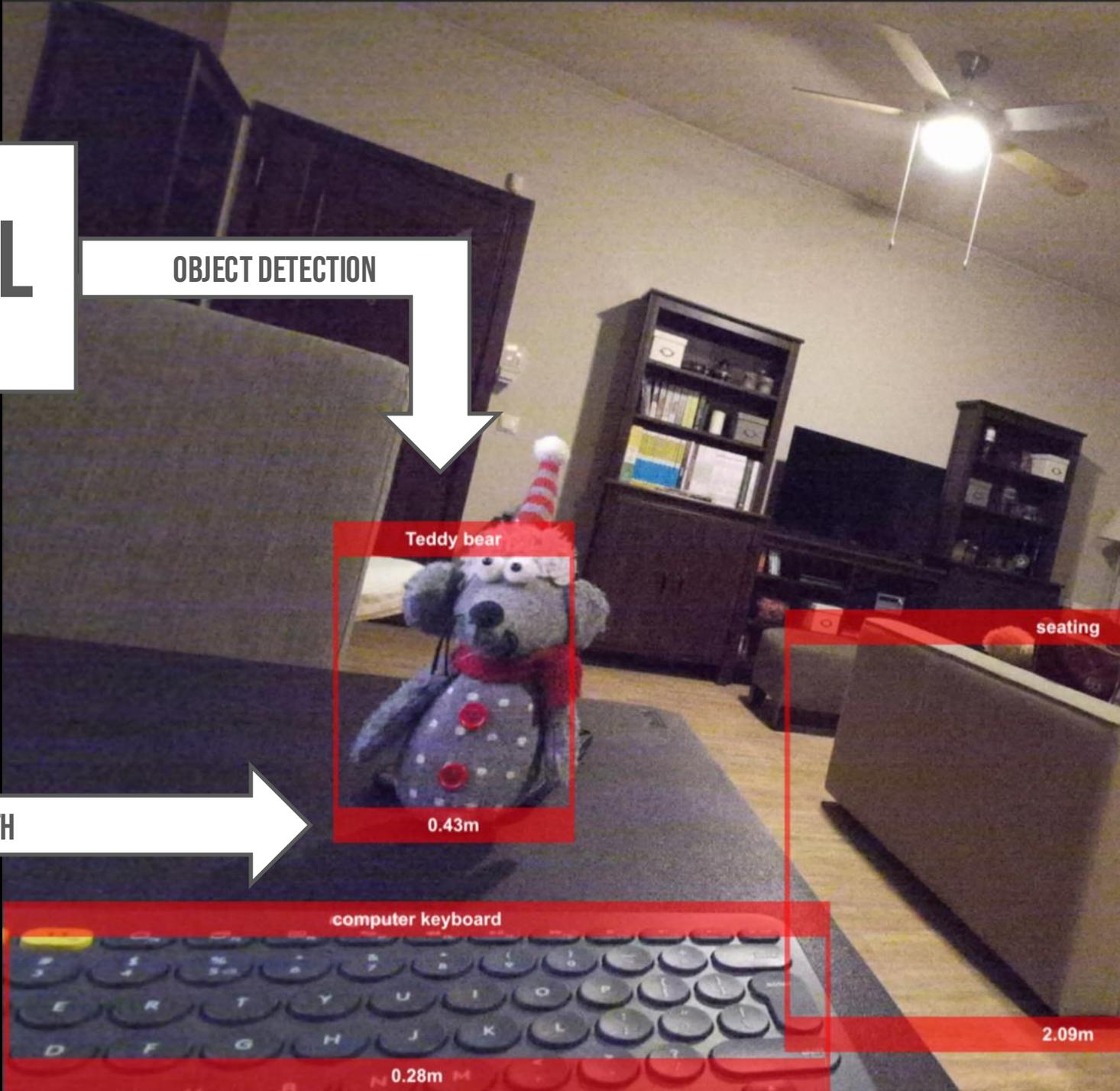




COLOR

ML

OBJECT DETECTION



Teddy bear

0.43m

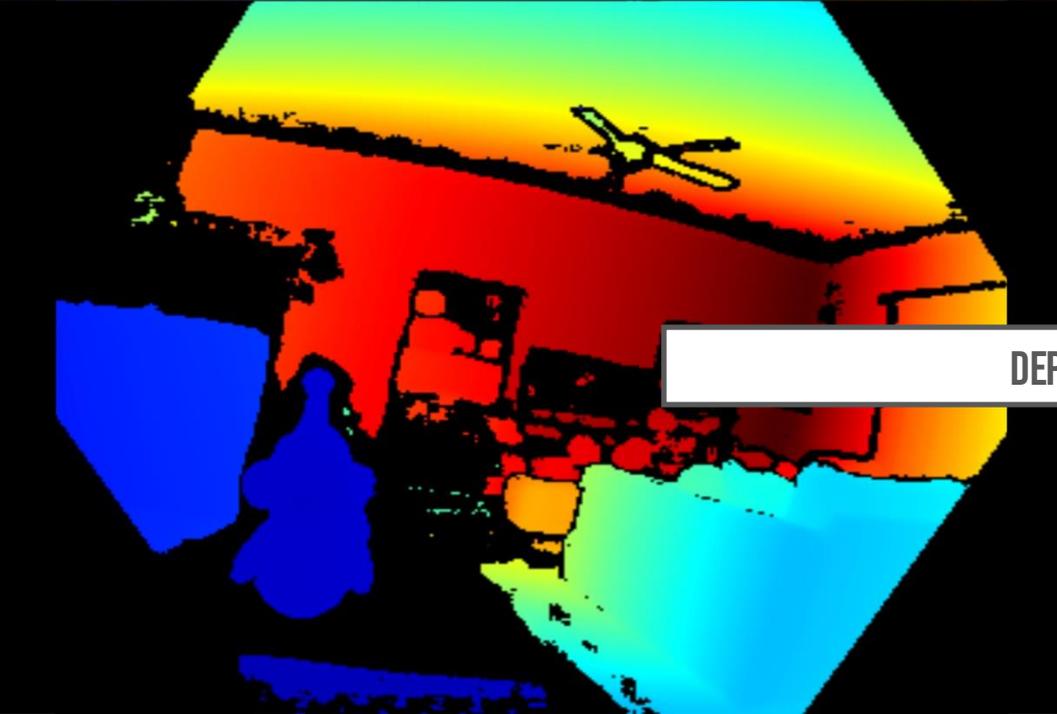
computer keyboard

0.28m

seating

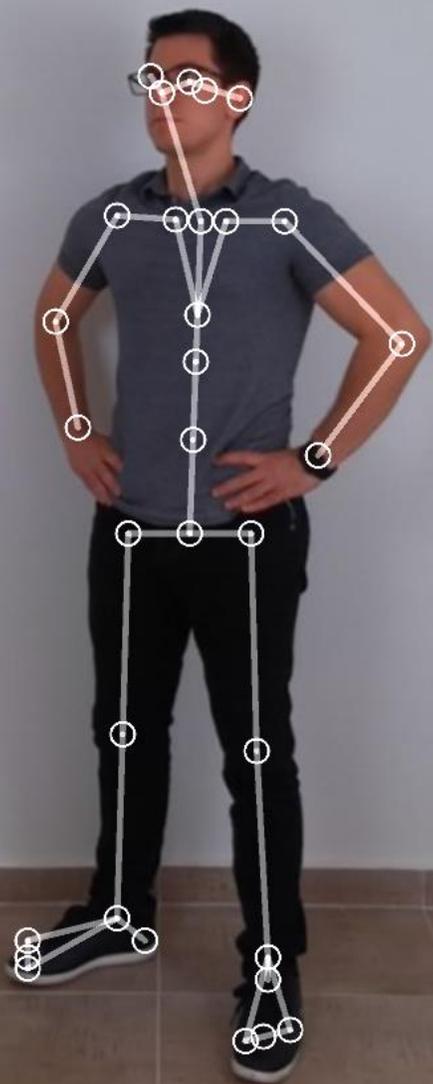
2.09m

DEPTH

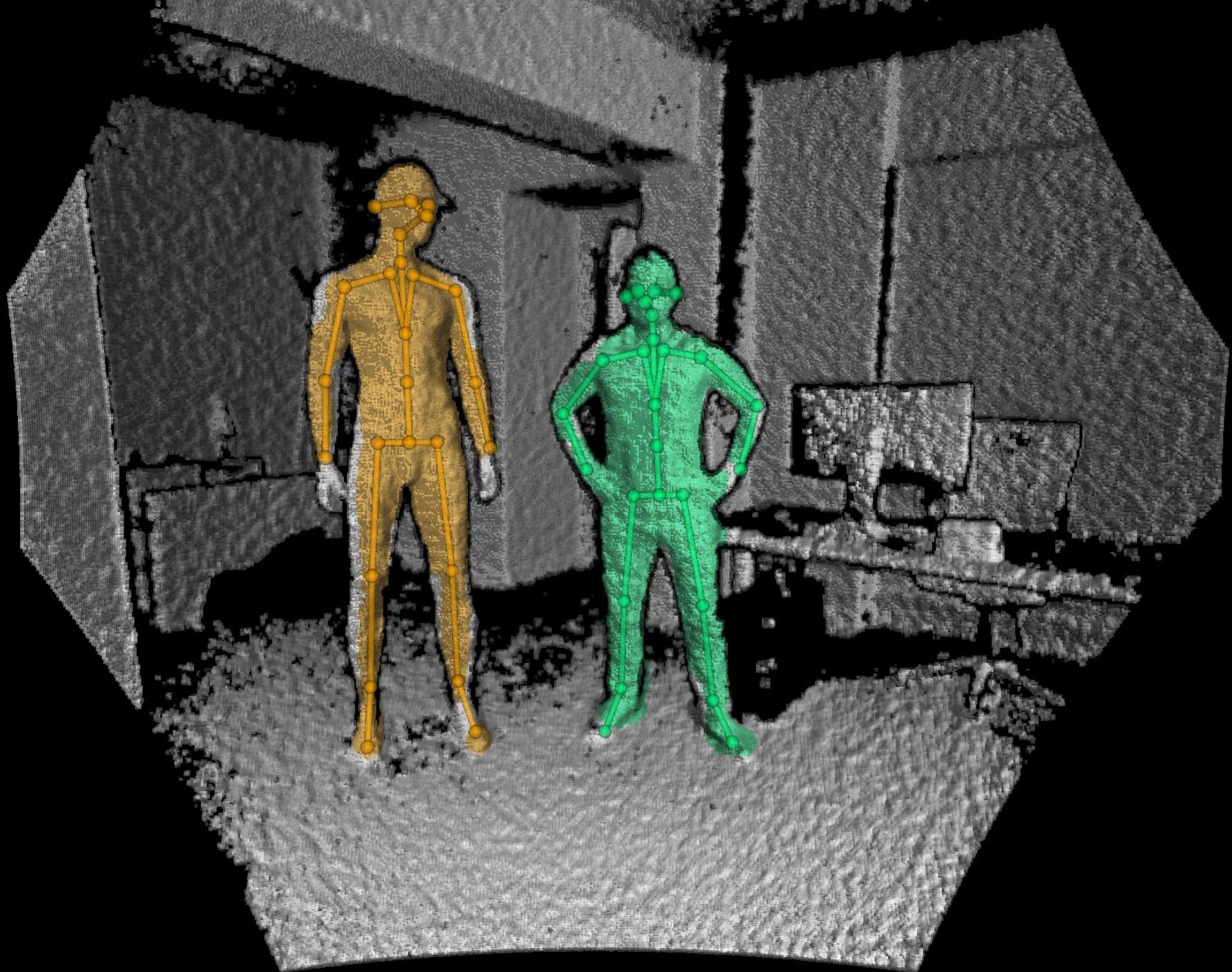


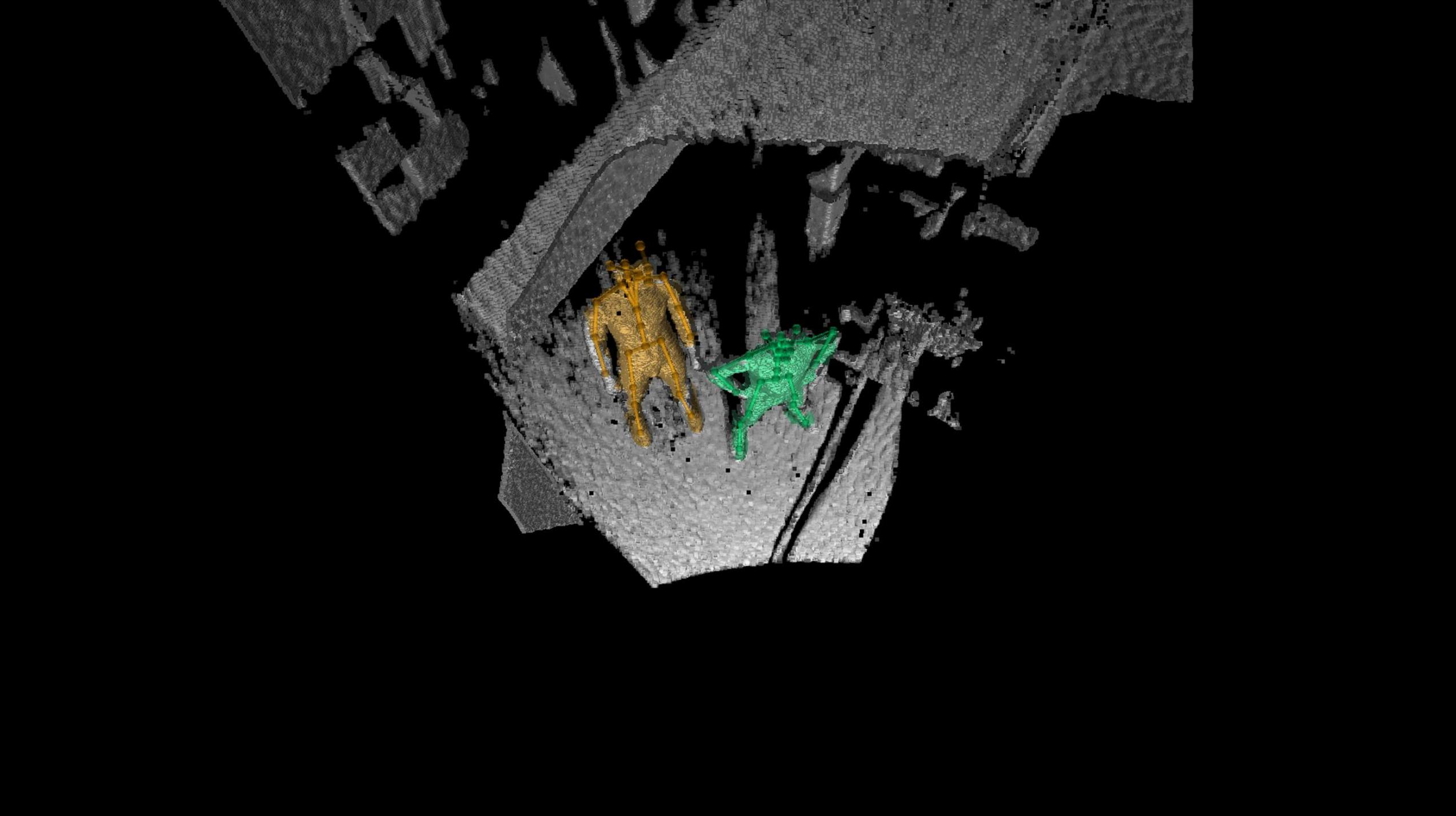
0

1920



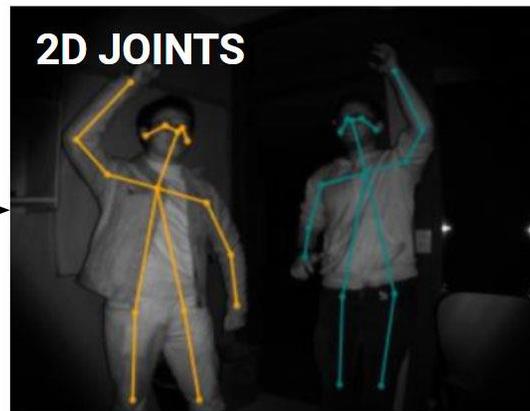
1080







NEURAL NETWORK

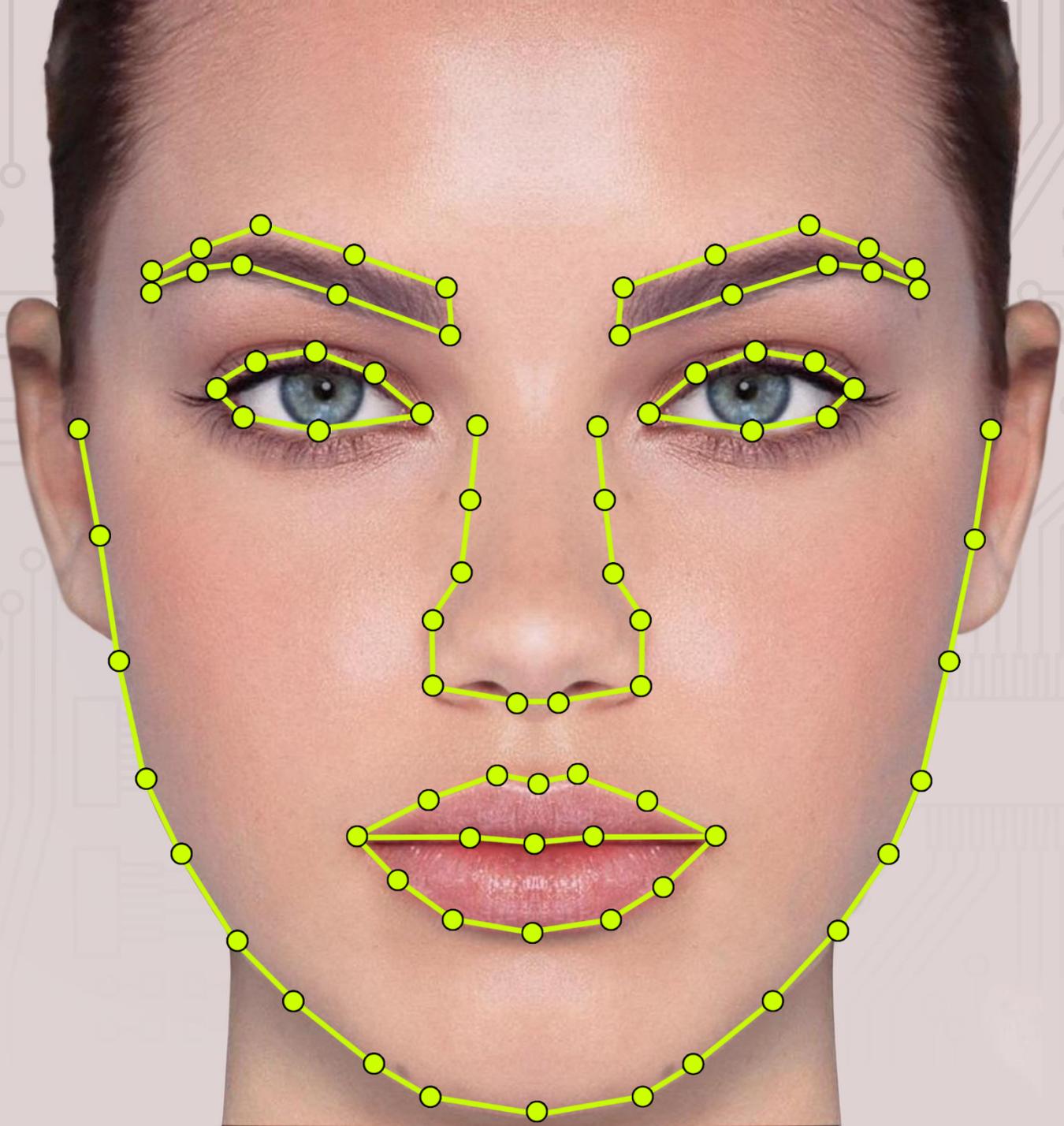


MODEL FITTING



BODY TRACKING





FACE + IRIS TRACKING



FINGER TRACKING

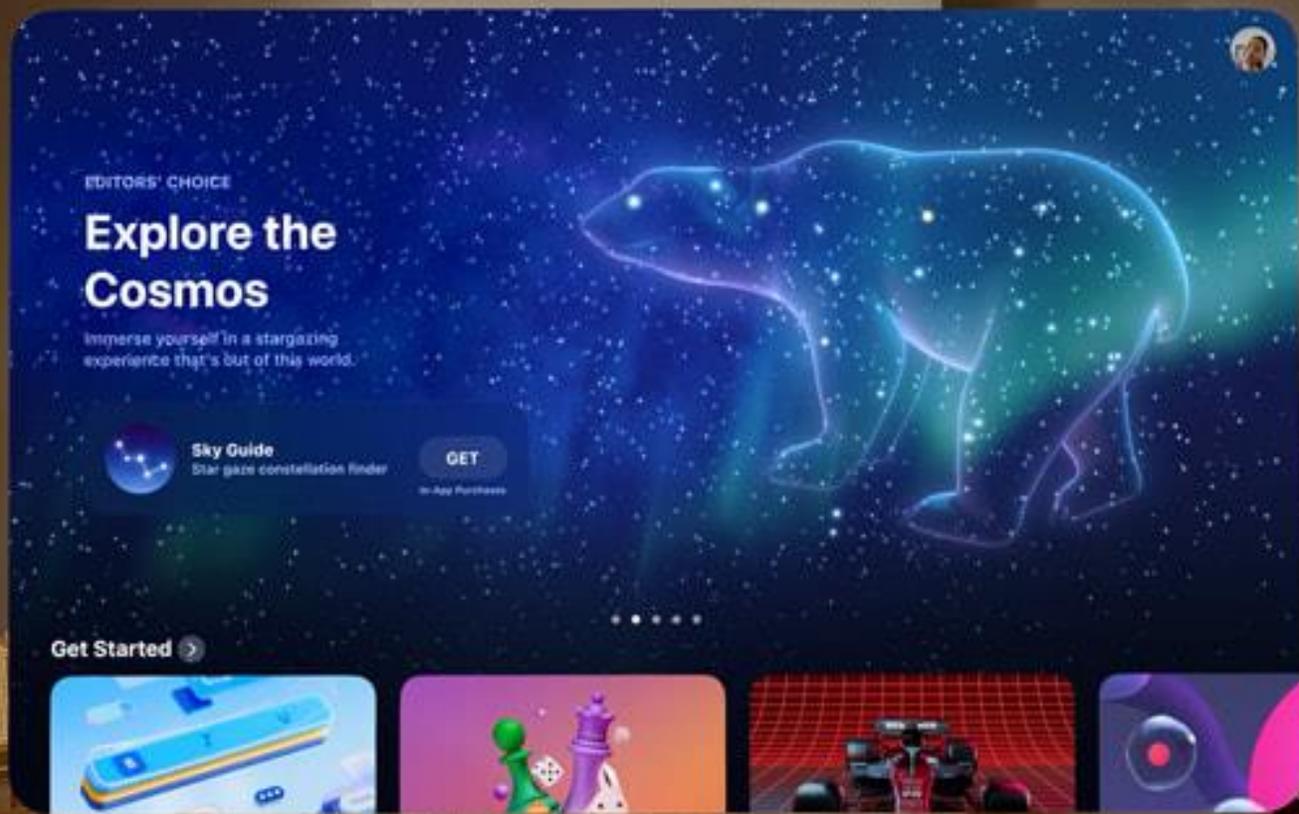


1110101
10100101010101000111
voice recognition
011011



MIXED

REALITY



New Post
+



Hotel Beach

Date Posted 10/24/2014



Life on the Island

Date Posted 10/18/2014



Hawaiian Flowers



Over

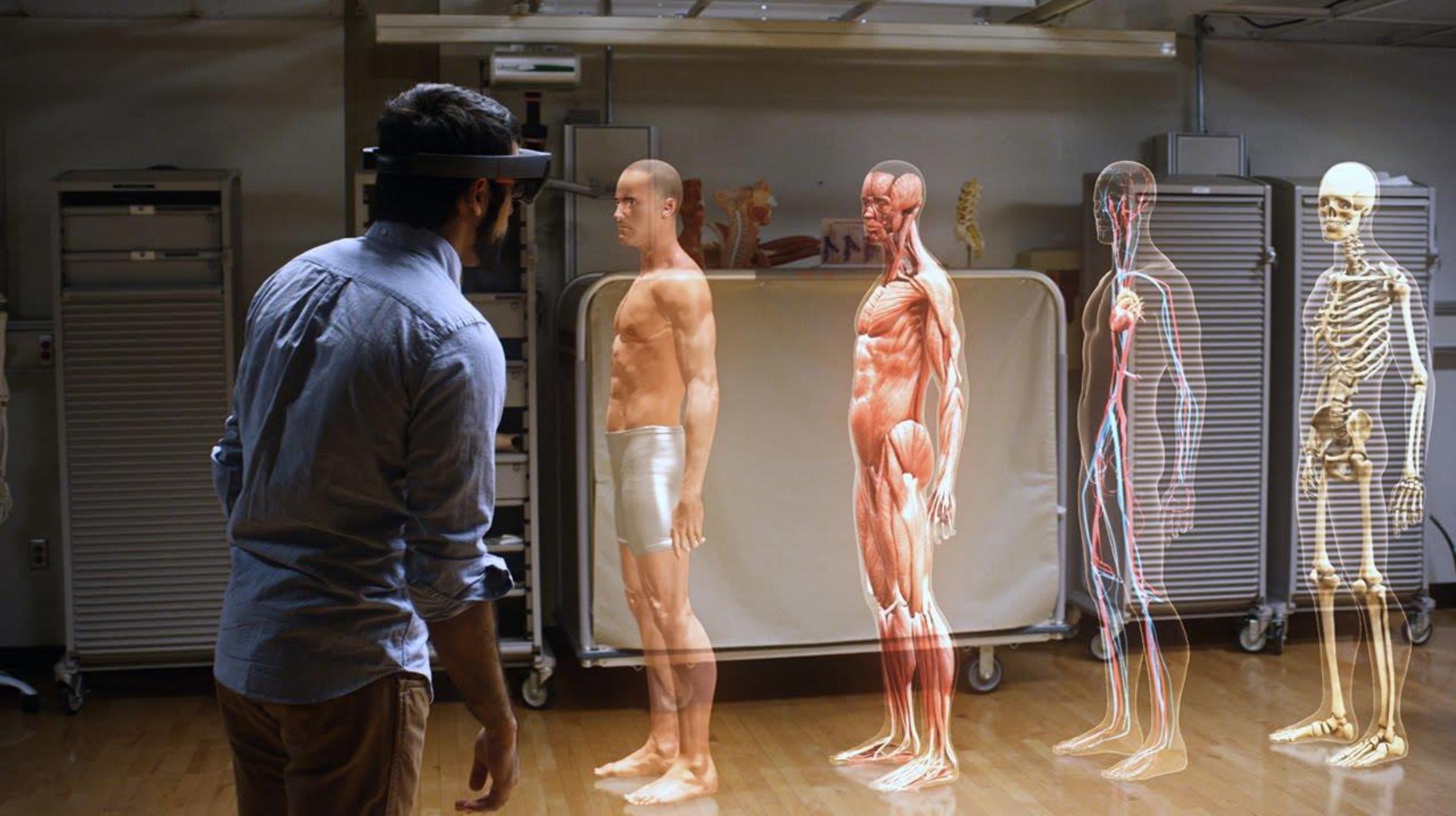
De

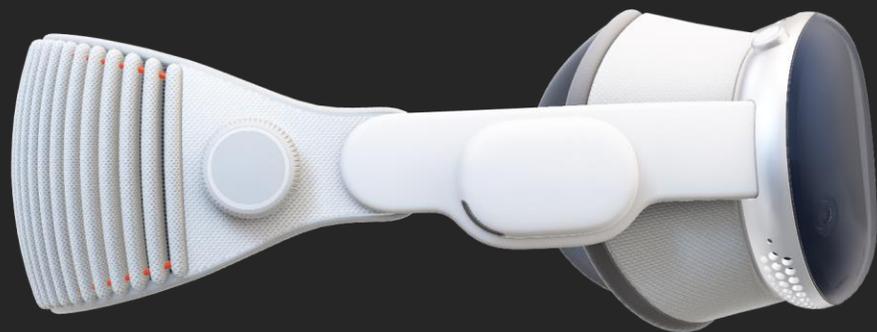


Virtual interface grid with icons for:

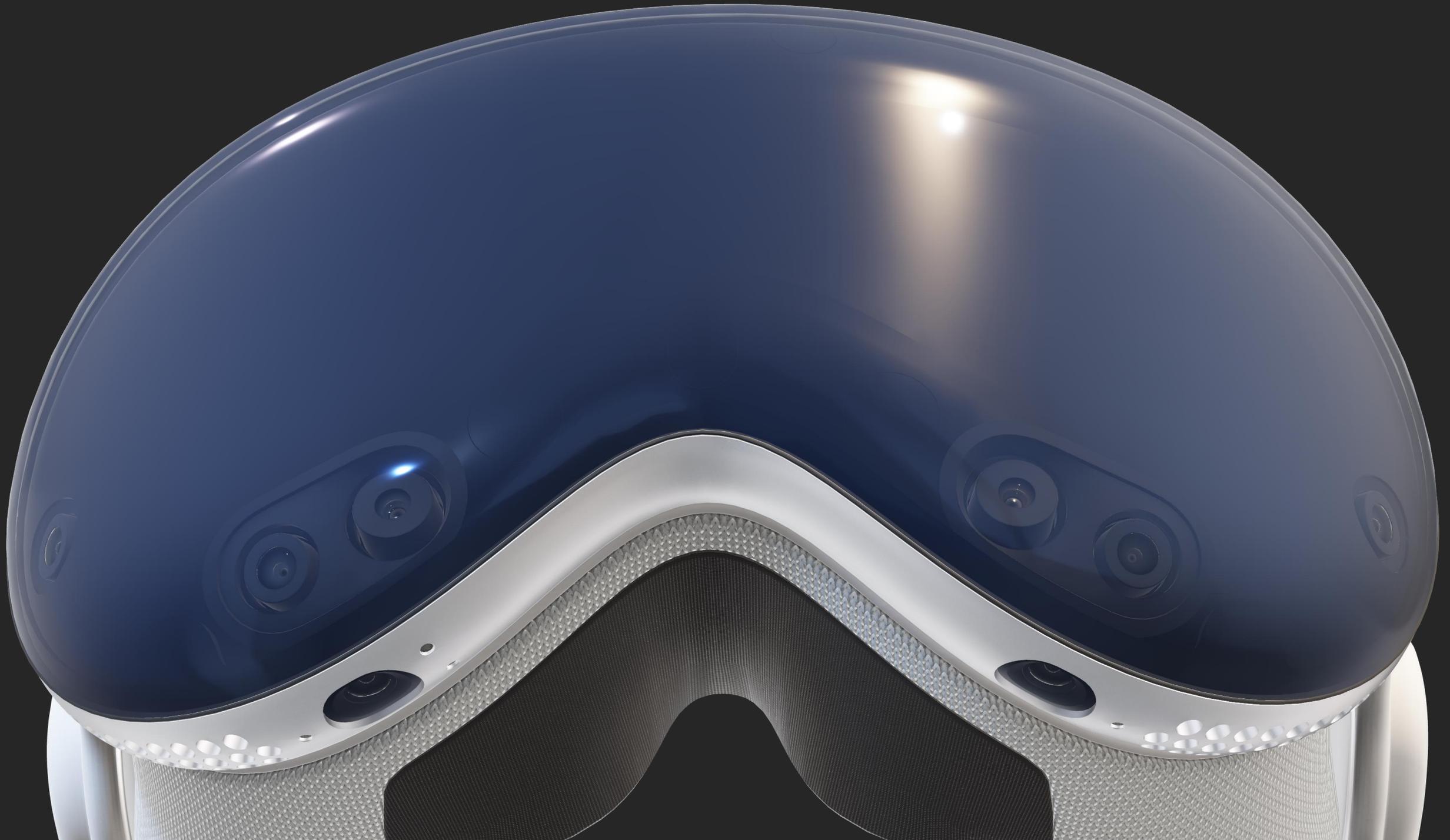
- Search (S)
- NETFLIX
- Windows Store
- Shopping
- Microsoft Edge
- ORBUS
- onsight
- e
- Headphones

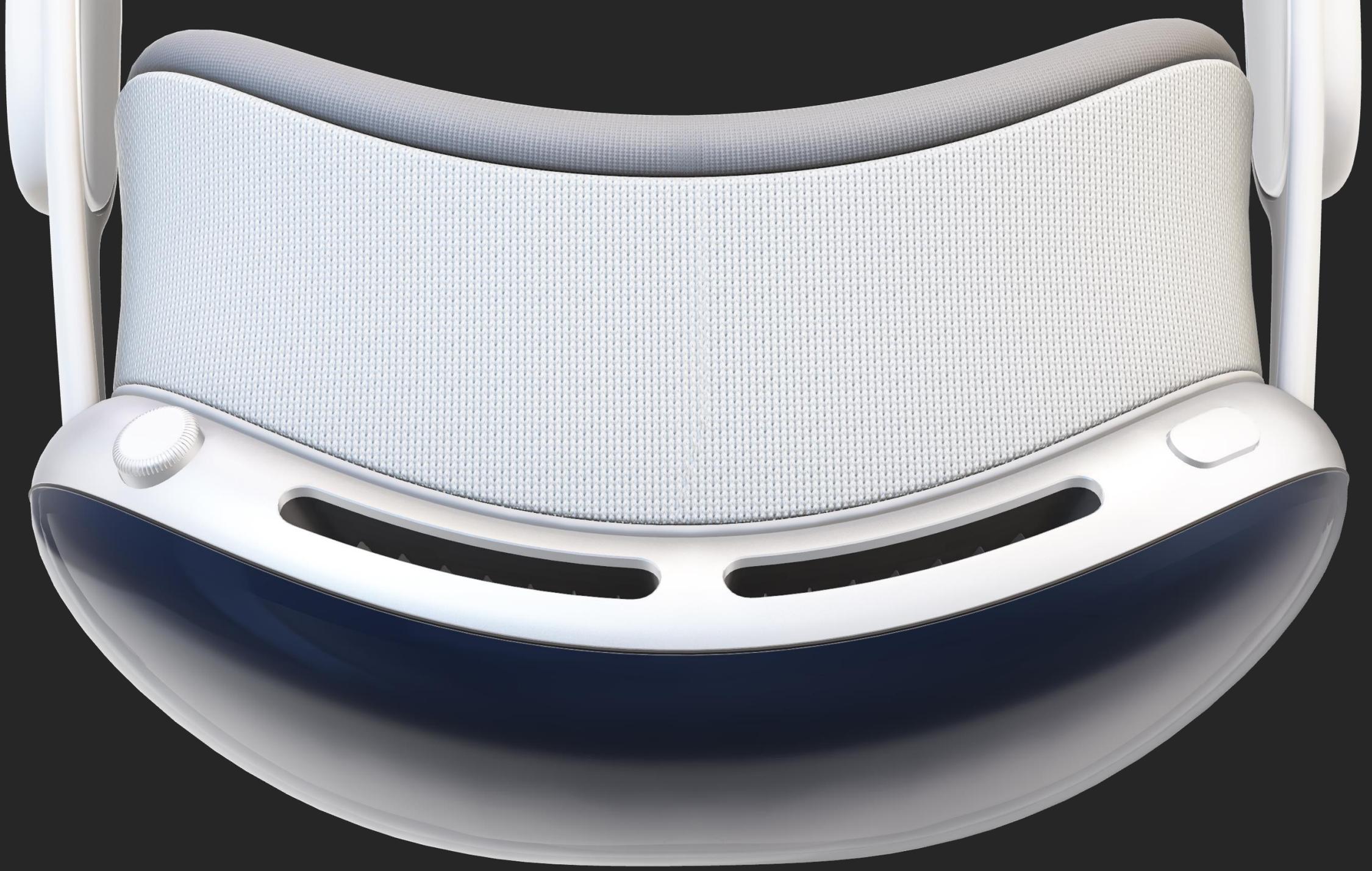




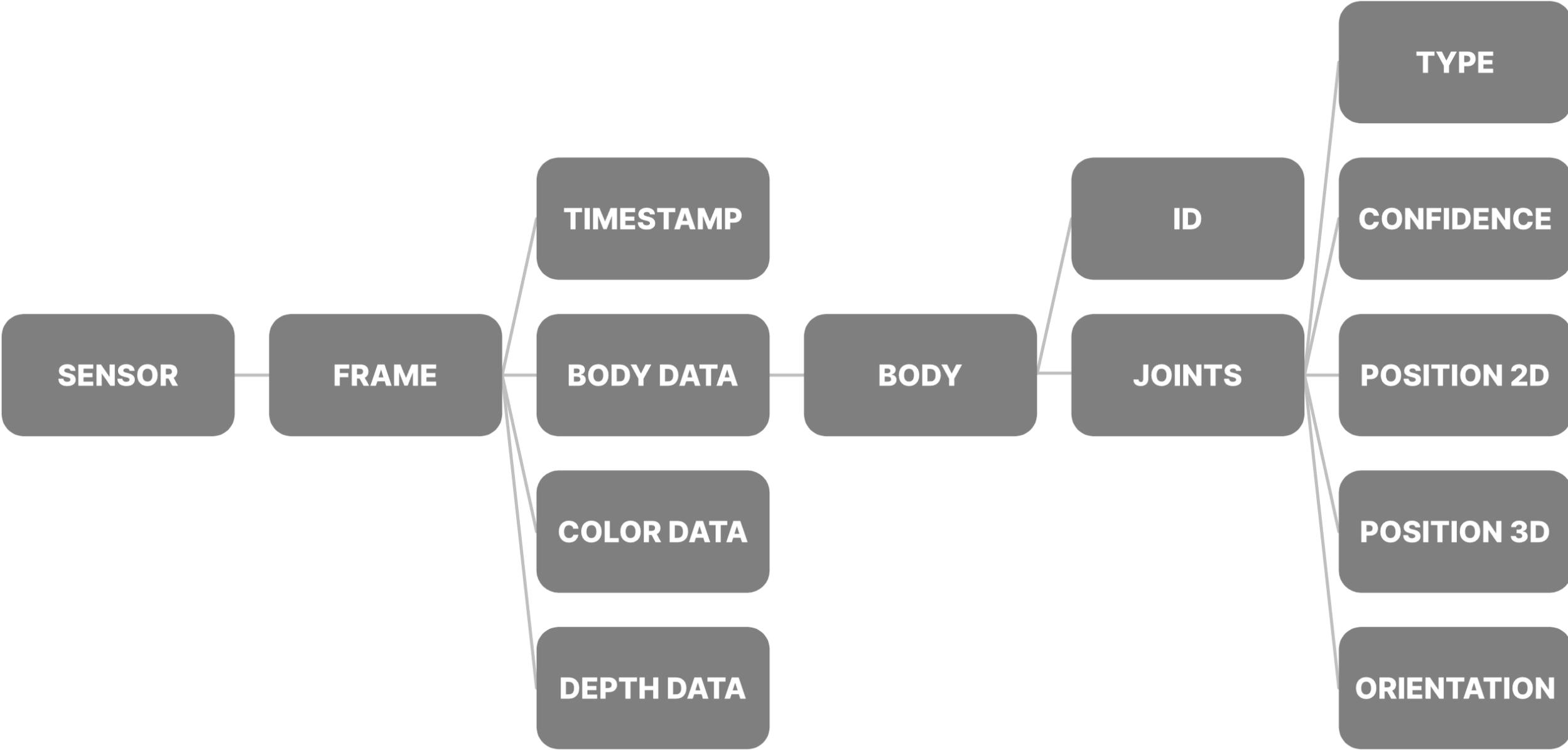








DEMOS



ΒΑΓΓΕΛΗΣ ΠΤΕΡΝΕΑΣ



vangos@pterneas.com

Mastering the Microsoft Kinect

Body Tracking, Object Detection,
and the Azure Cloud Services

—
Vangos Pterneas

Apress®

- [Apple](#)
- [Athens Academy](#)
- [Evangelia Sxoina](#)
- [Georgia Makoudi](#)
- [Getty Images](#)
- [Google](#)
- [HTC Vive](#)
- [Intel](#)
- [John Collier](#)
- [K-Type](#)
- [Konstantinos Egkarchos](#)
- [Magic Leap](#)
- [Mic \(Marvel Studios\)](#)
- [Microsoft](#)
- [Oculus Rift](#)
- [Tito Carmelo \(Creative Commons\)](#)
- [Yuri Khan](#)
- [Springer – Apress](#)

Thank
you