Natural User Interface

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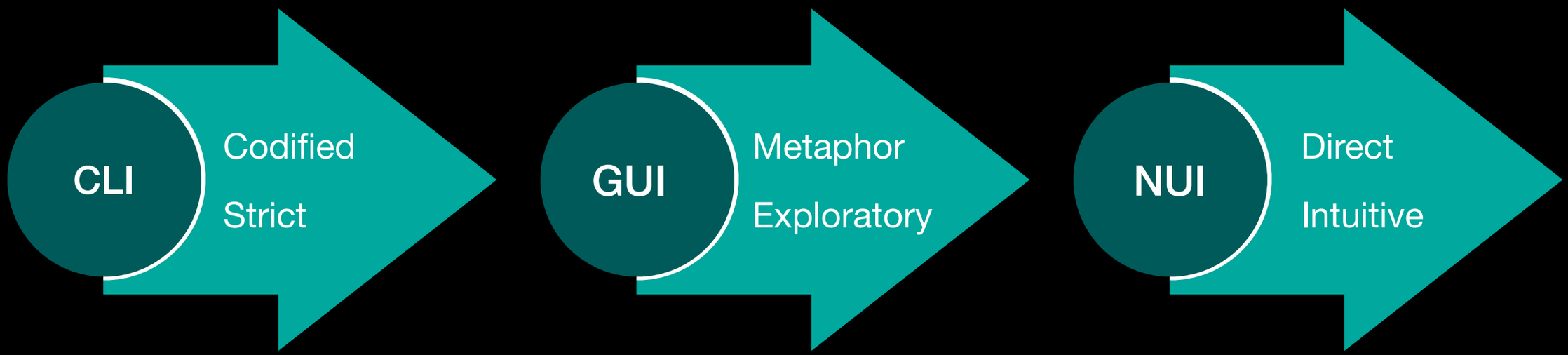
Questions We Asked

Are the interactions we have with your devices natural?

What is natural?

Why or why not?

History


CLI
Codified
Strict
GUI
Metaphor
Exploratory
NUI
Direct
Intuitive

History

Command-line interface (CLI)

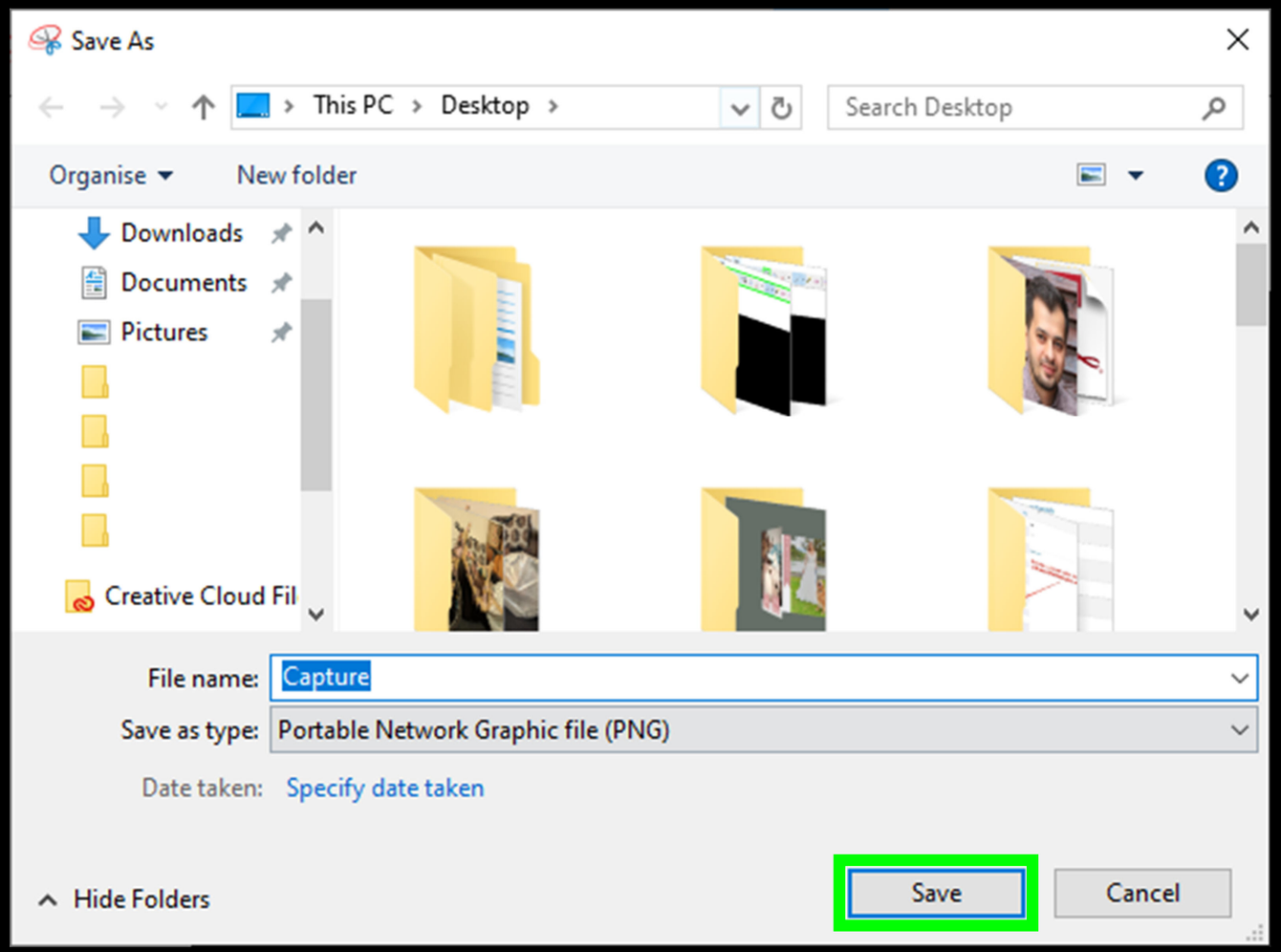
- Codified
- Strict

```
[root@localhost ~]# ping -q fa.wikipedia.org
PING text.pmtpa.wikimedia.org (208.80.152.2) 56(84) bytes of data.
^C
--- text.pmtpa.wikimedia.org ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 540.528/540.528/540.528/0.000 ms
[root@localhost ~]# pwd
/root
[root@localhost ~]# cd /var
[root@localhost var]# ls -la
total 72
drwxr-xr-x. 18 root root 4096 Jul 30 22:43 .
drwxr-xr-x. 23 root root 4096 Sep 14 20:42 ..
drwxr-xr-x.  2 root root 4096 May 14 00:15 account
drwxr-xr-x. 11 root root 4096 Jul 31 22:26 cache
drwxr-xr-x.  3 root root 4096 May 18 16:03 db
drwxr-xr-x.  3 root root 4096 May 18 16:03 empty
drwxr-xr-x.  2 root root 4096 May 18 16:03 games
drwxrwx--T.  2 root gdm  4096 Jun  2 18:39 gdm
drwxr-xr-x. 38 root root 4096 May 18 16:03 lib
drwxr-xr-x.  2 root root 4096 May 18 16:03 local
lrwxrwxrwx.  1 root root   11 May 14 00:12 lock -> ../run/lock
drwxr-xr-x. 14 root root 4096 Sep 14 20:42 log
lrwxrwxrwx.  1 root root   10 Jul 30 22:43 mail -> spool/mail
drwxr-xr-x.  2 root root 4096 May 18 16:03 nis
drwxr-xr-x.  2 root root 4096 May 18 16:03 opt
drwxr-xr-x.  2 root root 4096 May 18 16:03 preserve
drwxr-xr-x.  2 root root 4096 Jul  1 22:11 report
lrwxrwxrwx.  1 root root    6 May 14 00:12 run -> ../run
drwxr-xr-x. 14 root root 4096 May 18 16:03 spool
drwxrwxrwt.  4 root root 4096 Sep 12 23:50 tmp
drwxr-xr-x.  2 root root 4096 May 18 16:03 yp
[root@localhost var]# yum search wiki
Loaded plugins: langpacks, presto, refresh-packagekit, remove-with-leaves
rpmfusion-free-updates                                                   | 2.7 kB     00:00
rpmfusion-free-updates/primary_db                                        | 206 kB     00:04
rpmfusion-nonfree-updates                                                | 2.7 kB     00:00
updates/metalink                                                         | 5.9 kB     00:00
updates                                                                  | 4.7 kB     00:00
updates/primary_db                      73% [=====================        ]  62 kB/s | 2.6 MB     00:15 ETA
```

History

Graphical user interface (GUI)

- Metaphor
- Exploratory

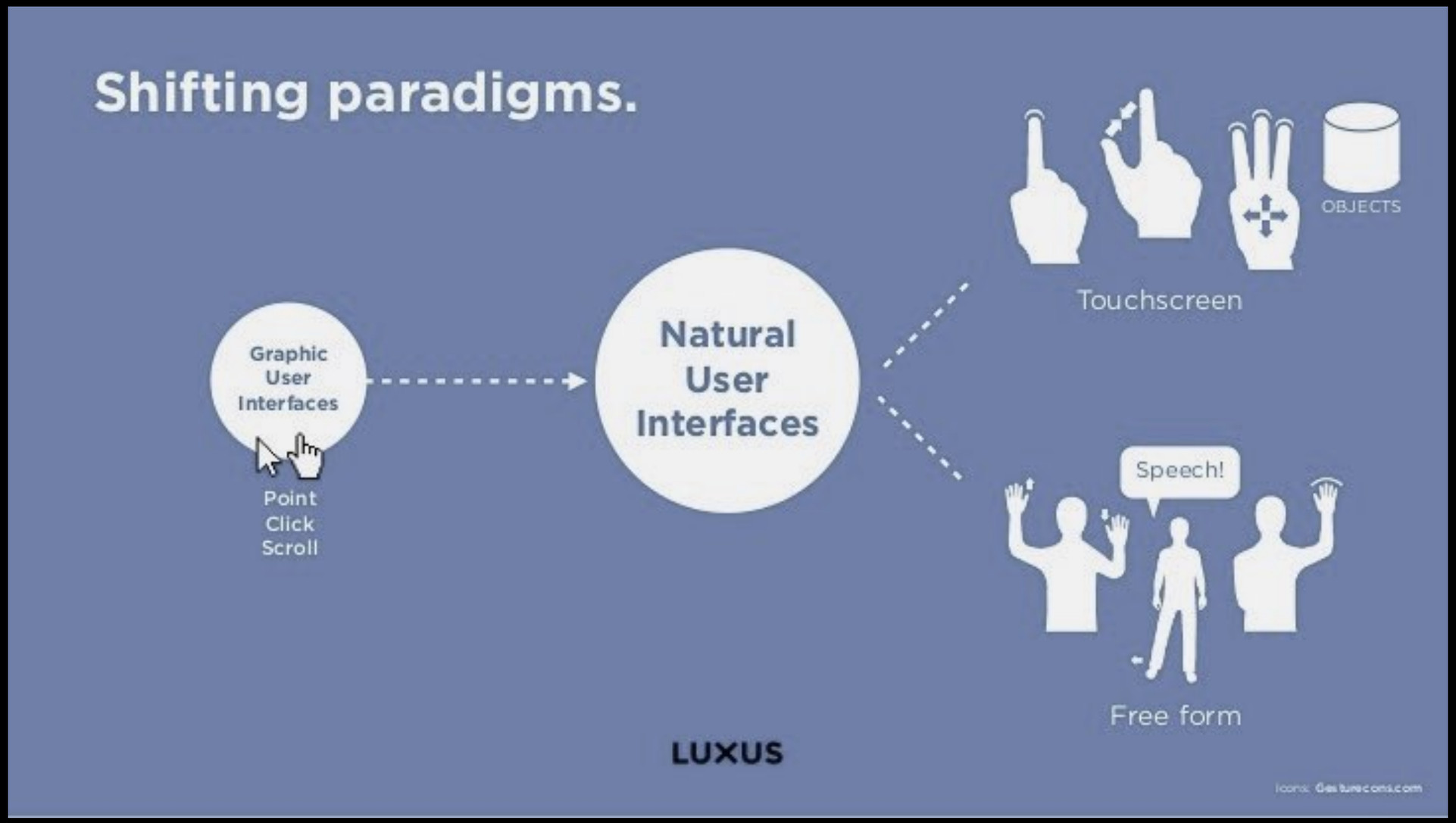


History

Natural user interface (NUI)

- Direct
- Intuitive

Currently


Shifting paradigms.
OBJECTS
Touchscreen
Graphic User Interfaces
Point
Click
Scroll
Natural User Interfaces
Speech!
Free form
LUXUS

Components of NUI

Invisible Computing

Invisible computing is when hardware virtually disappears, as computing technology unobtrusively integrates with everyday, natural human function.

Supportive Computing

Supportive computing is computing technology that supports natural human function, rather than requires humans to adapt to computing functions.

Adaptive Computing

Adaptive computing and machine learning intelligently recognize and interpret human patterns to produce output based on relative context.

https://content.pivotal.io/blog/the-future-of-ux-ui-the-natural-user-interface

Bill Buxton,

Principal Researcher,Microsoft Research

“It’s not about the technology it’s about the human doing the gesturing”

“It’s layering multiple modalities and how they are used together in context”

“It’s about the information being delivered in the most natural way for the purpose”

“without technology intruding but rather it being transparent and enhancing our quality of life”

https://www.youtube.com/watch?time_continue=412&v=NcdrfacG_y4

Current fields using NUI

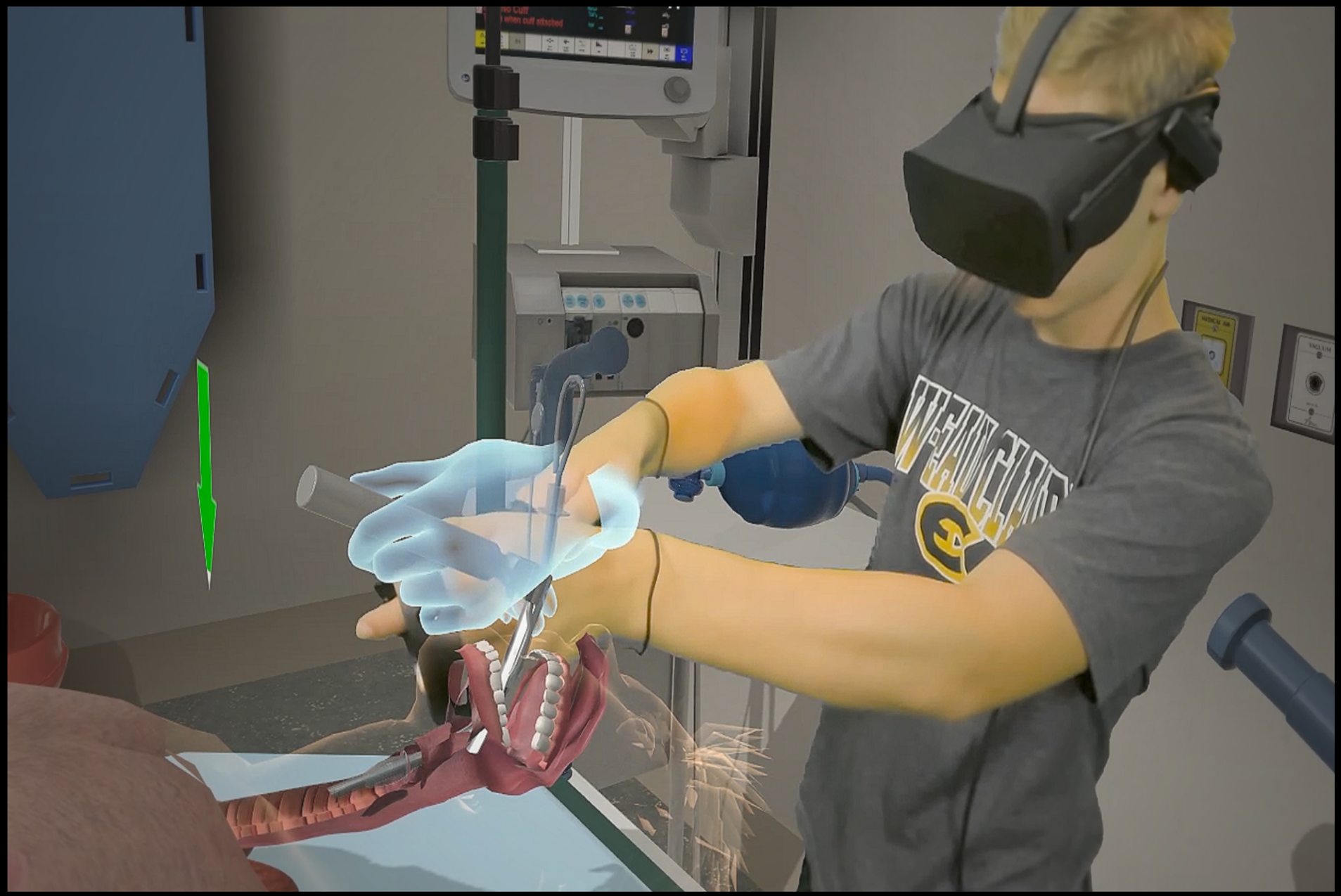
Medical Field

Gaming Industry

Personal Devices

Medical Field

Medical Field



Medical Field

Medical Field

Gaming Industry

Tobii Eye Tracker 4C ($169)

https://www.youtube.com/watch?v=cU9ue7r7rbA

Myo Armband ($199)

https://www.youtube.com/watch?v=HD-2NWvjuSA

Beat Saber with VR ($300 PS4 + $300 VR set)

https://www.youtube.com/watch?v=gV1sw4IfwFw

KAT Walk mini ($2,999)

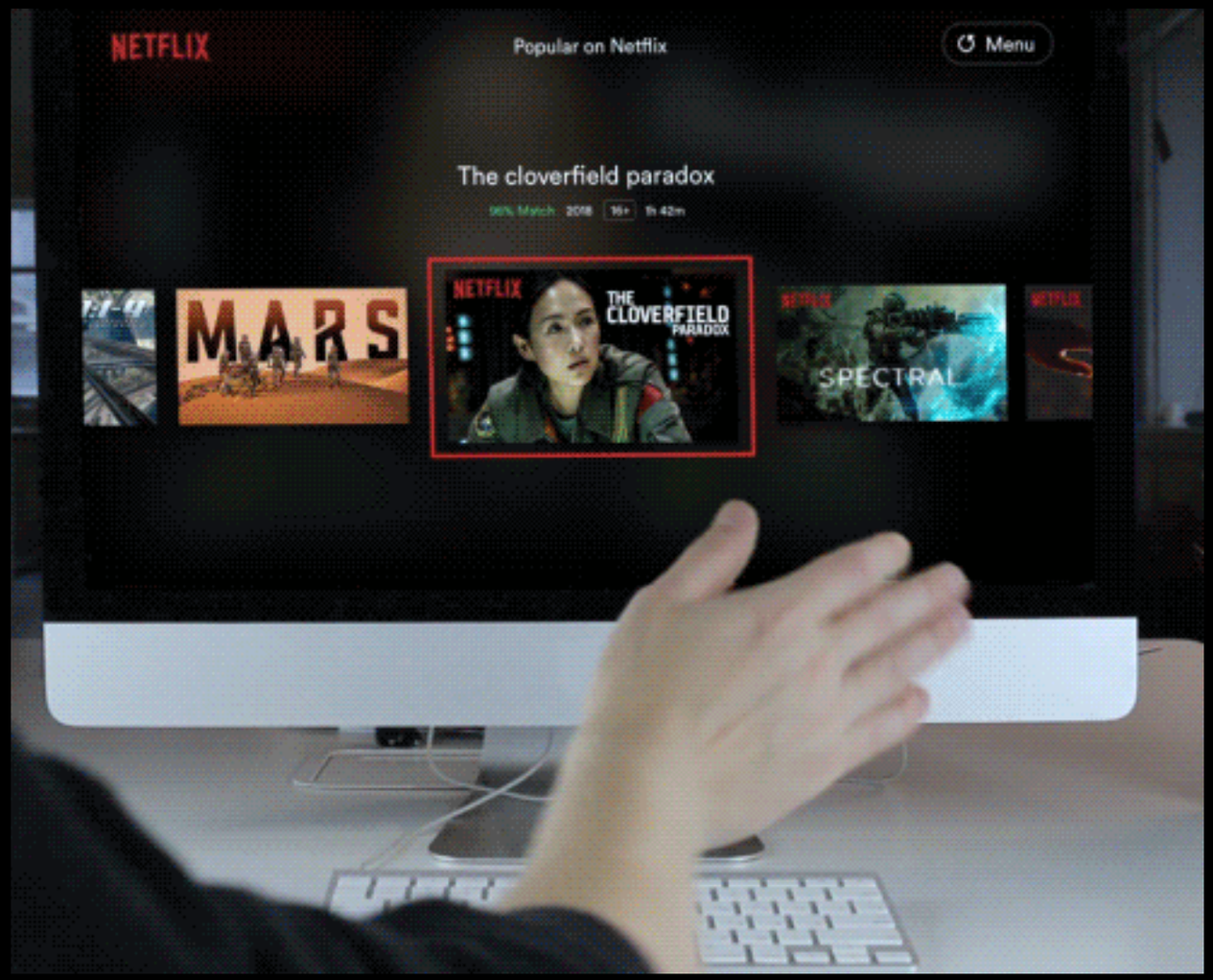
https://www.youtube.com/watch?v=A3NwsyZB0O8

Personal Devices

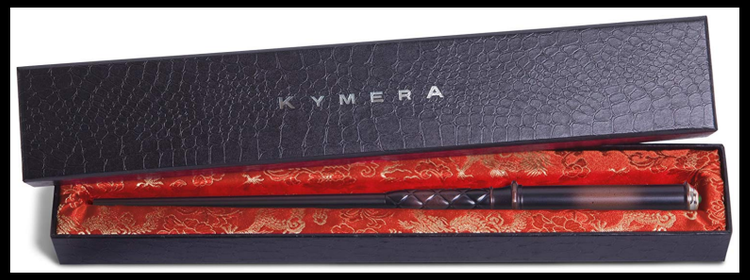
Touch/Gesture Interfaces

Pixel 4
Gesture control

Touch/Gesture Interfaces

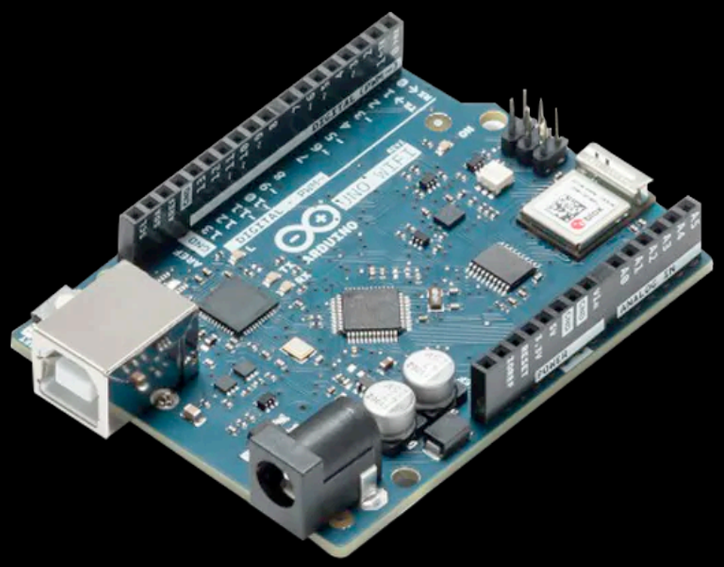


Touch/Gesture/Voice Interfaces



Hardware for building

What hardware can designers use to build NUI prototypes?



https://gallery.leapmotion.com/cat-explorer/

Software for building

What software can designers use to build NUI prototypes?

Voice Control

Voice + Gesture Control

Voice + Gesture Control

Best practice

Take advantage of a user's basic skills

Adapt your NUI to what we already know how to do.

https://www.postscapes.com/bluetooth-gesture-control-ring/

Context is key

Will it be used in a crowded location? What about when driving a car?

Keep cognitive load low

Avoid creating complex, unnatural interfaces and high learning curves.

NUI Charades Workshop

1. **Get into groups of 3 (one group of 4)**
2. **Draw a task**
3. **Use the tasks as a starting point for creating 3 NUI interactions:**

    1. Two people
    2. One person (entire body)
    3. Go wild!

Questions to consider

Can you implement this in your project or future designs?

What details do you need to think about to make it work for your project?

What other areas of opportunities exist?

What comes next in/after NUI?

Reflections

Think beyond direct translation

Abstract ideas are hard

How will you push the design in the future?

Thank you!