Augmenting Desktop Workstation with Actuated Devices

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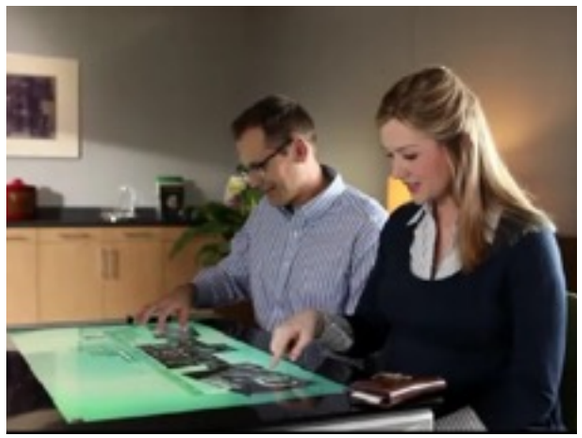
Motivations & Myths

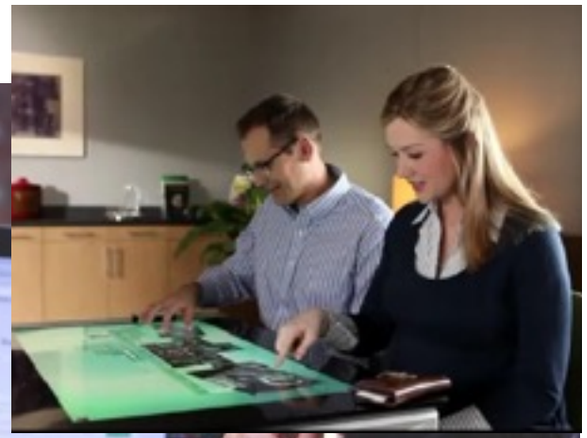
Is the Desktop workstation dead?

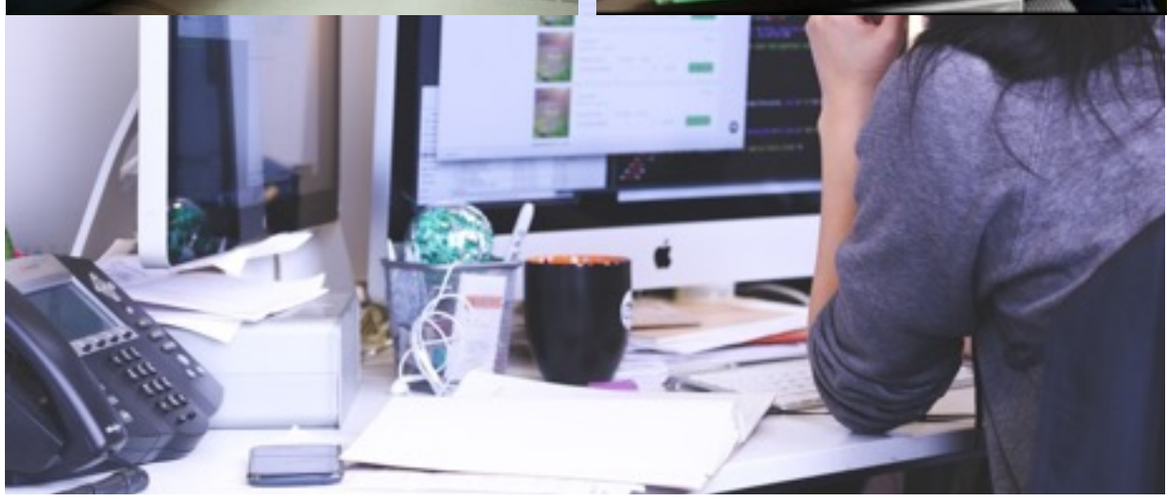


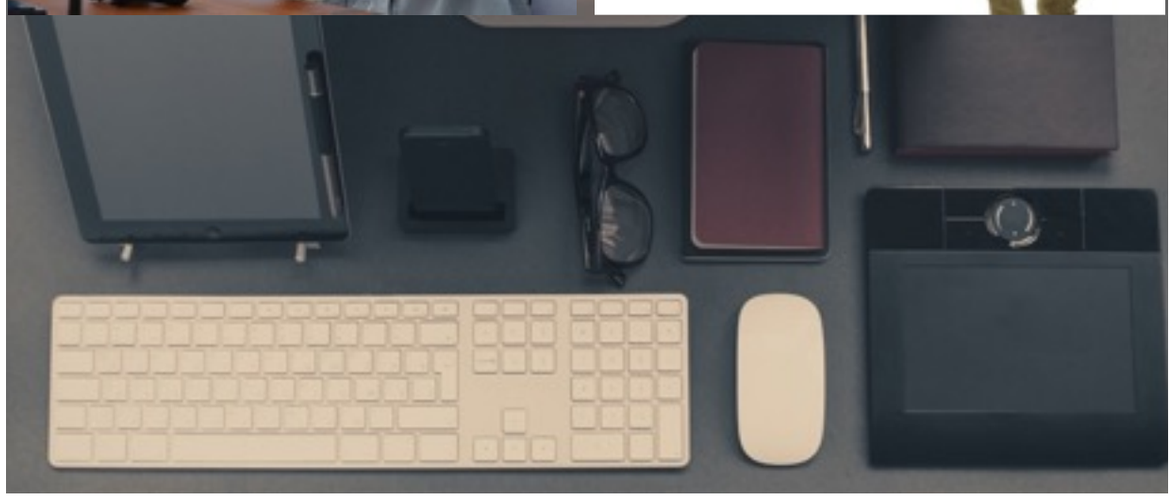
Who wrote his paper with only these technologies?

"Everything is the best for something and the worst for something else"

–Bill Buxton

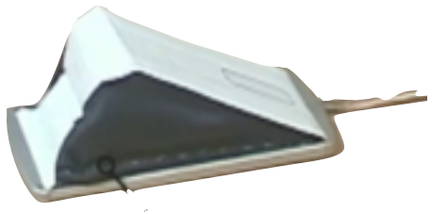


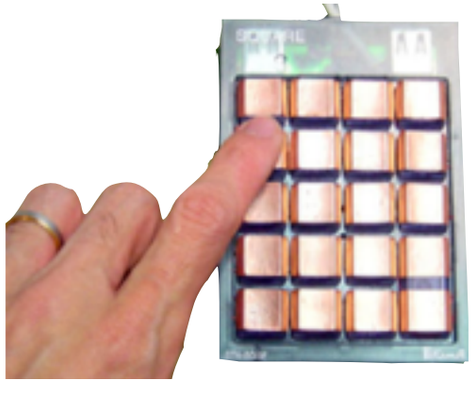


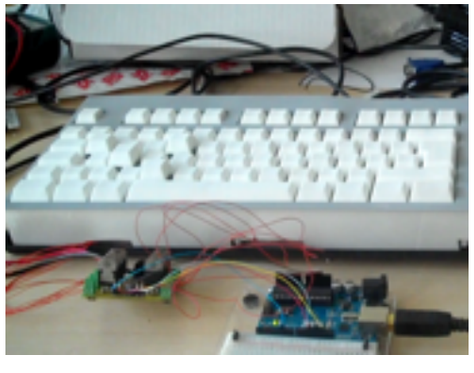


The desktop computer is not dead.

Can we still improve it?







SketchPad
[Sutherland 1963]

The Demo
[Englebart 1968]

Digital Desk
[1993]

Curve
[Wimmer 2010]

Magic Desk
[Bi 2012]

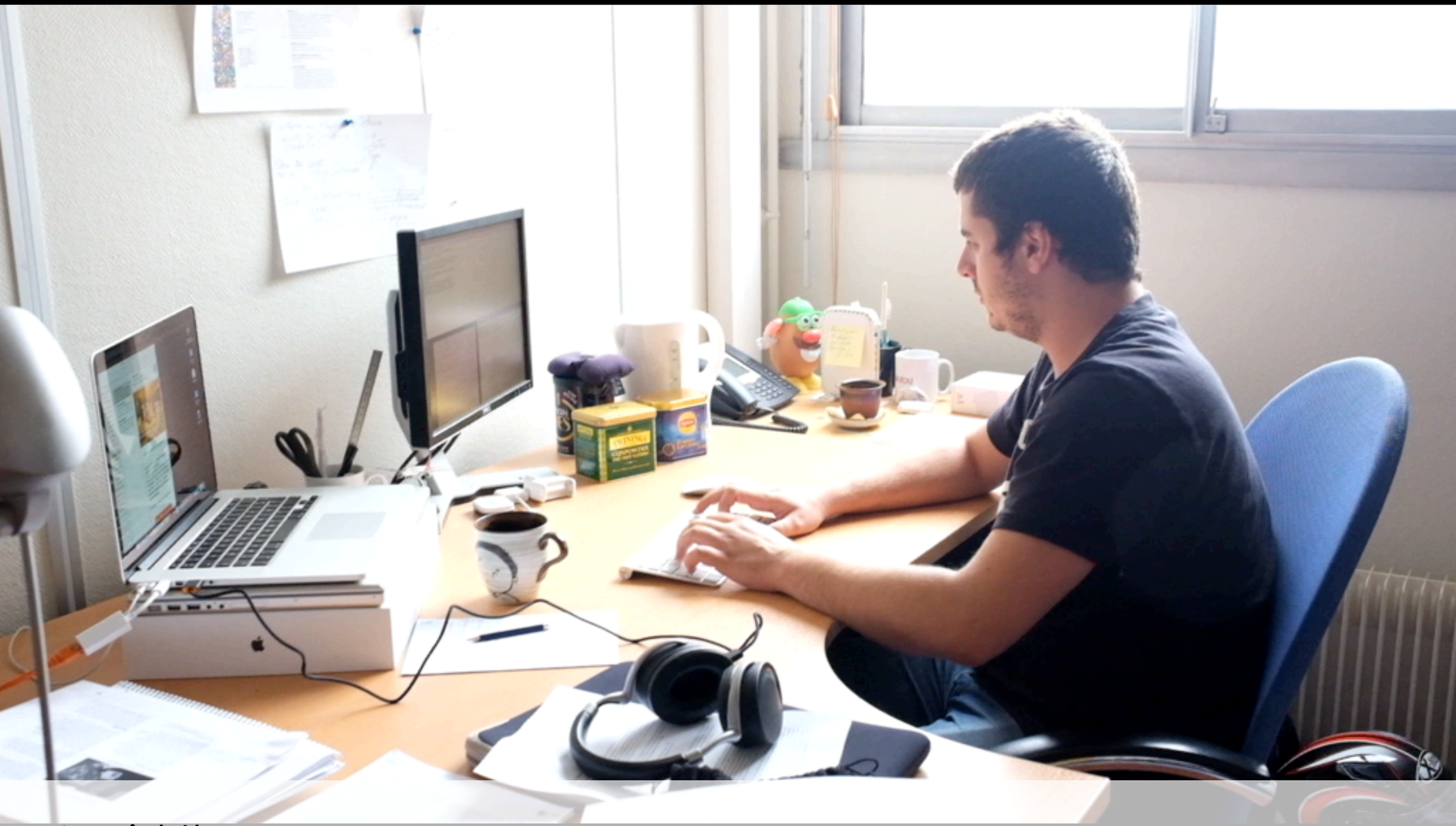
Desktop devices evolved a lot.

The desktop workstation evolved a little.

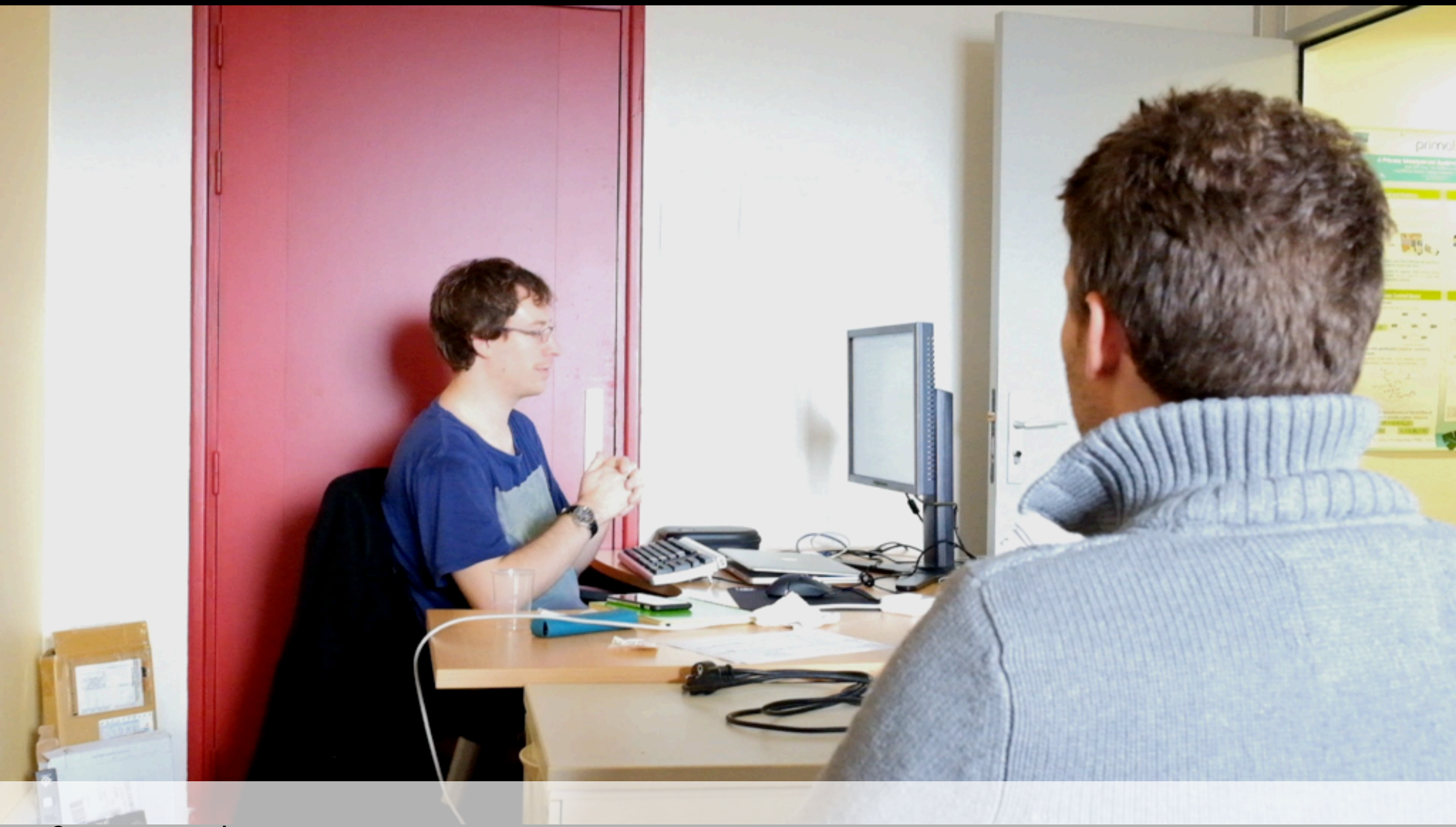
Is the desktop workstation static?

Formative study

Arriving at the office

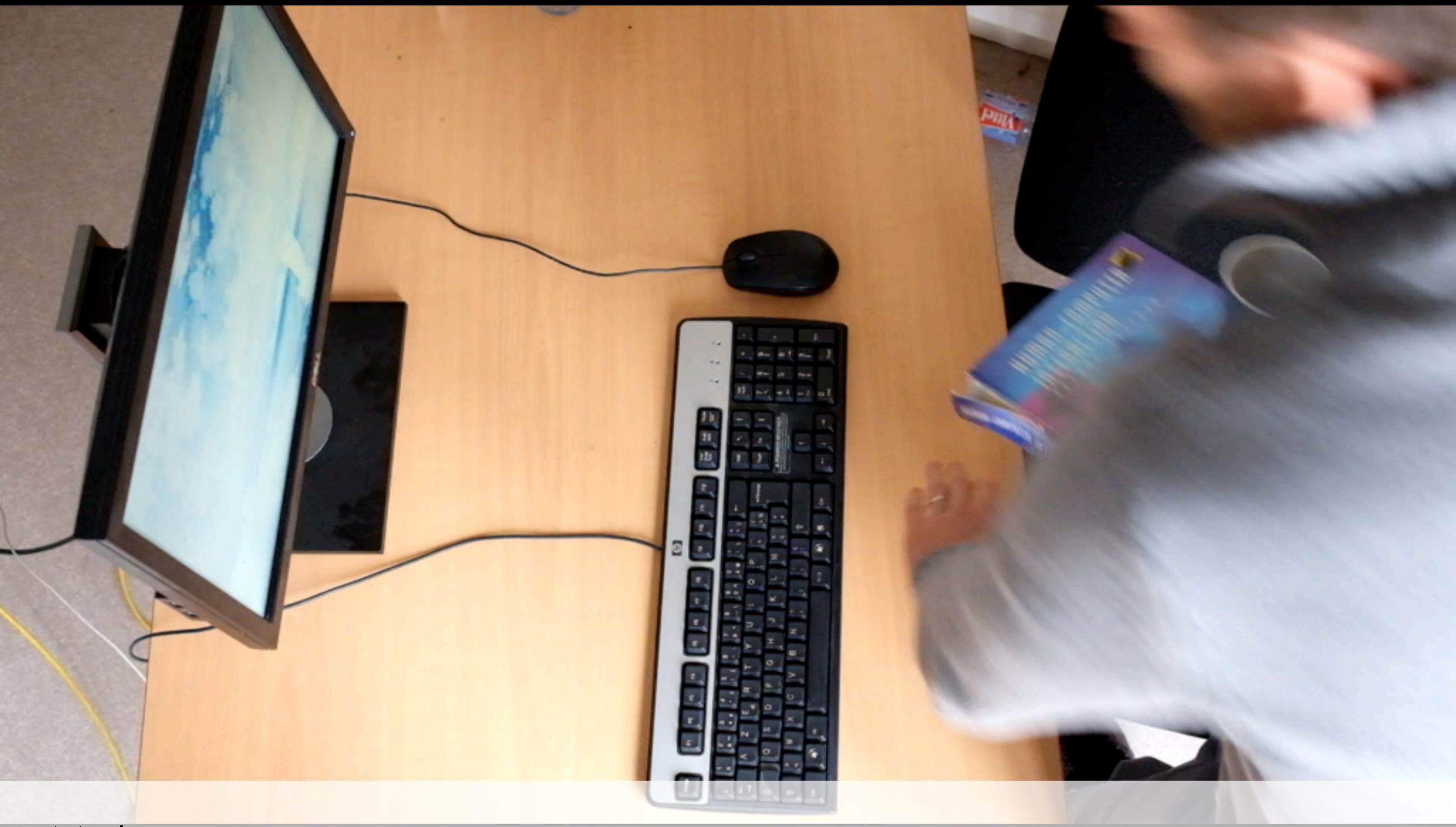


Avoid the sun



Screen share

Co-working



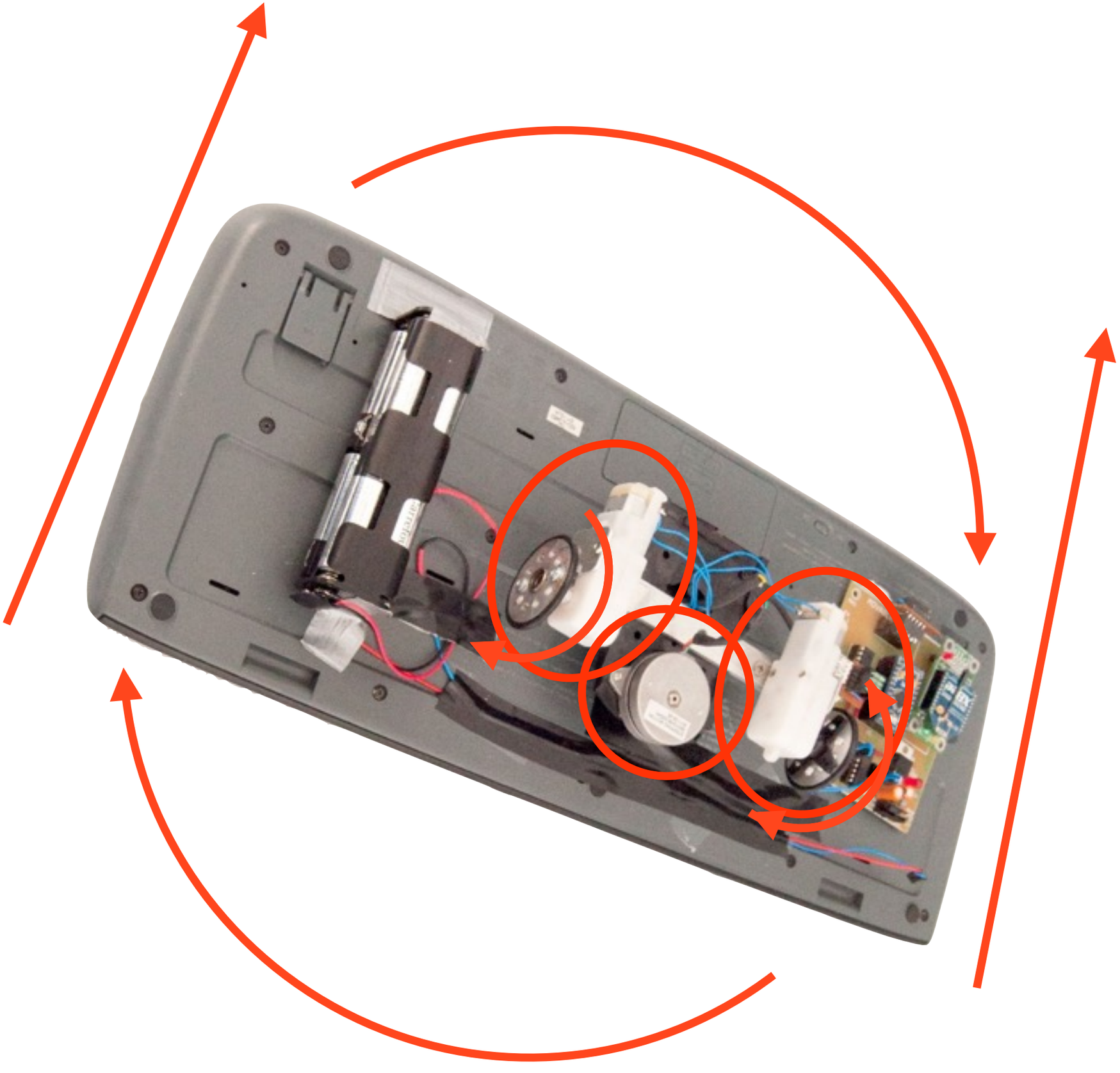
Make space

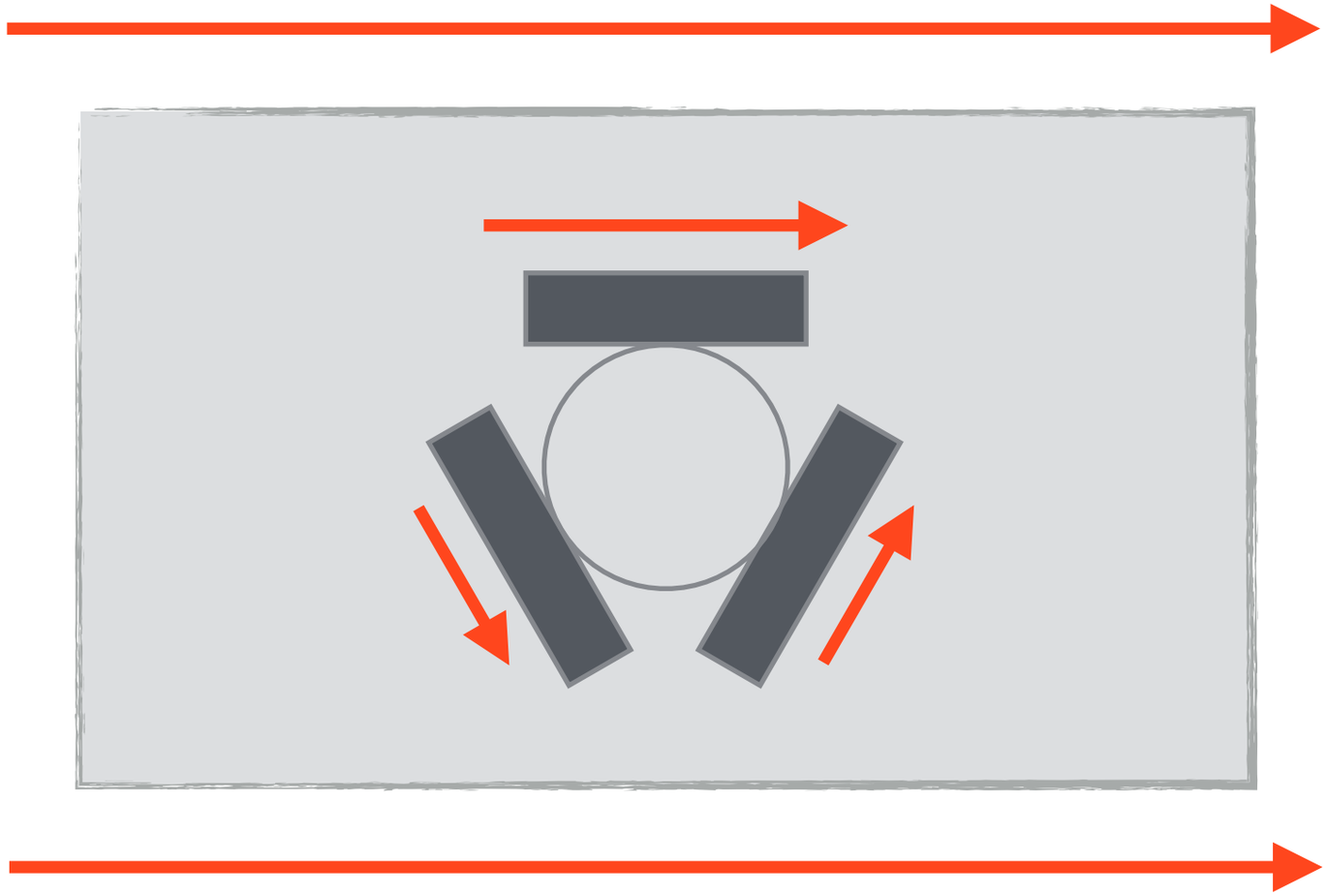
We frequently arrange our desktop devices.

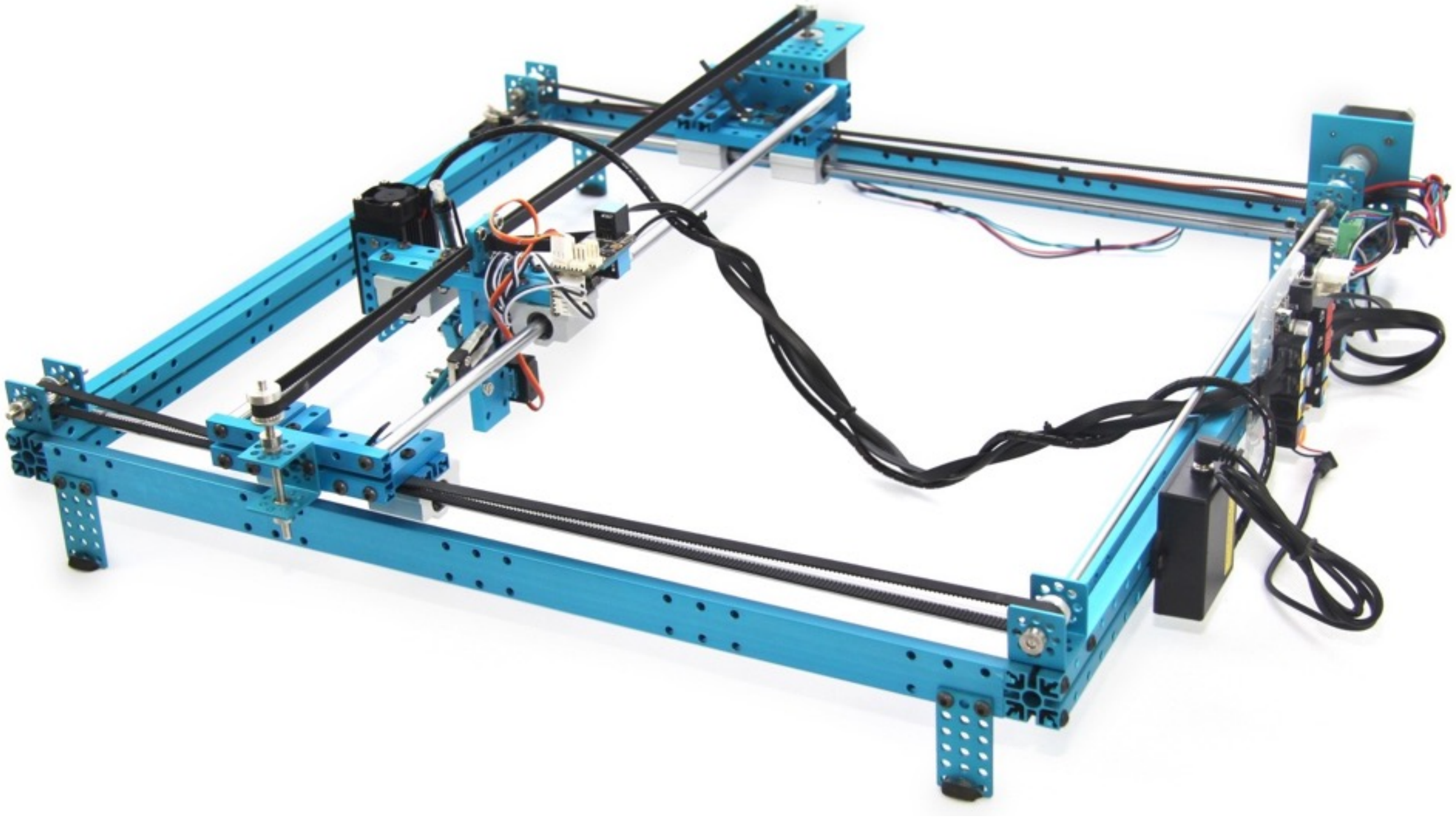
Living Desktop

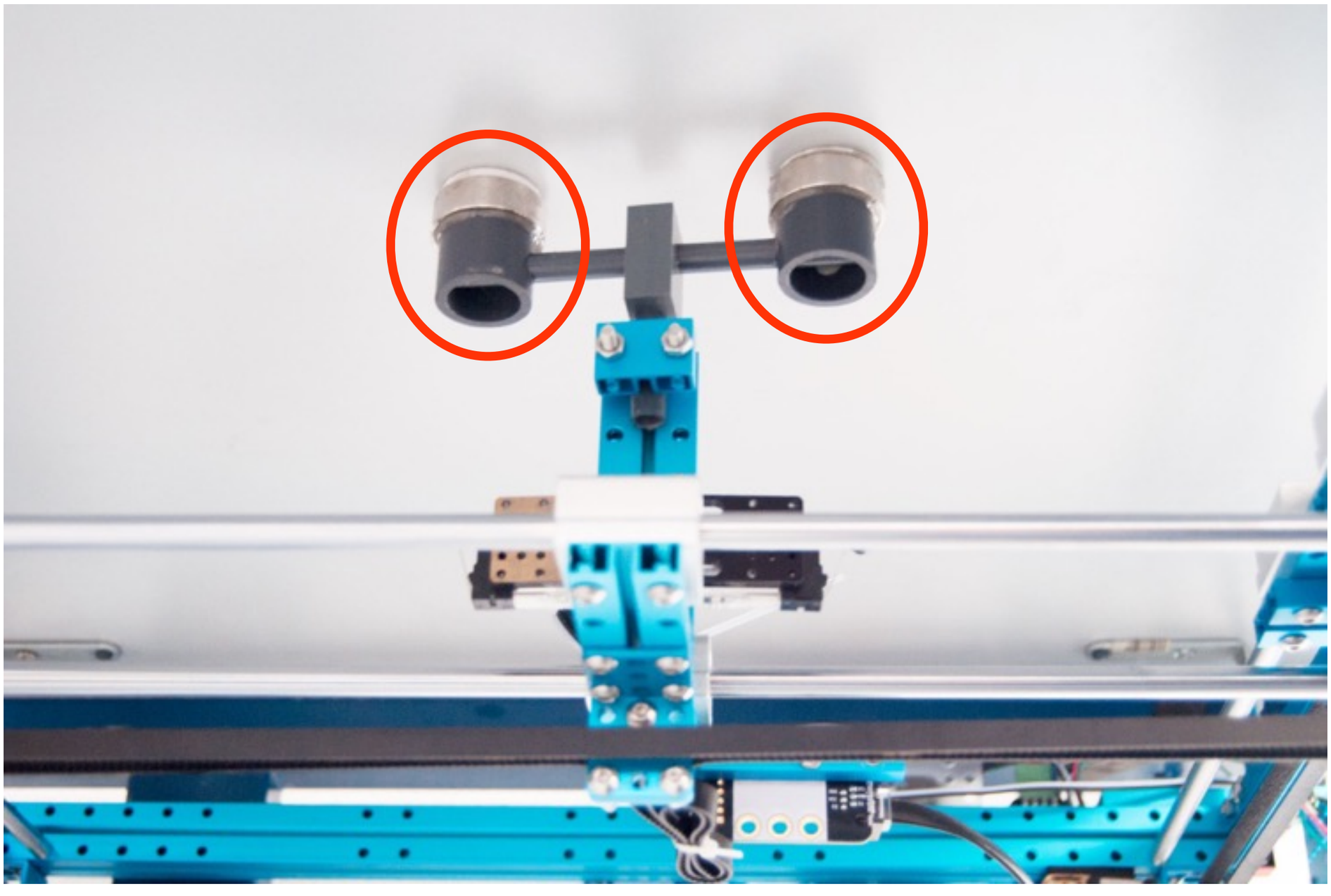
MK320
Logitech

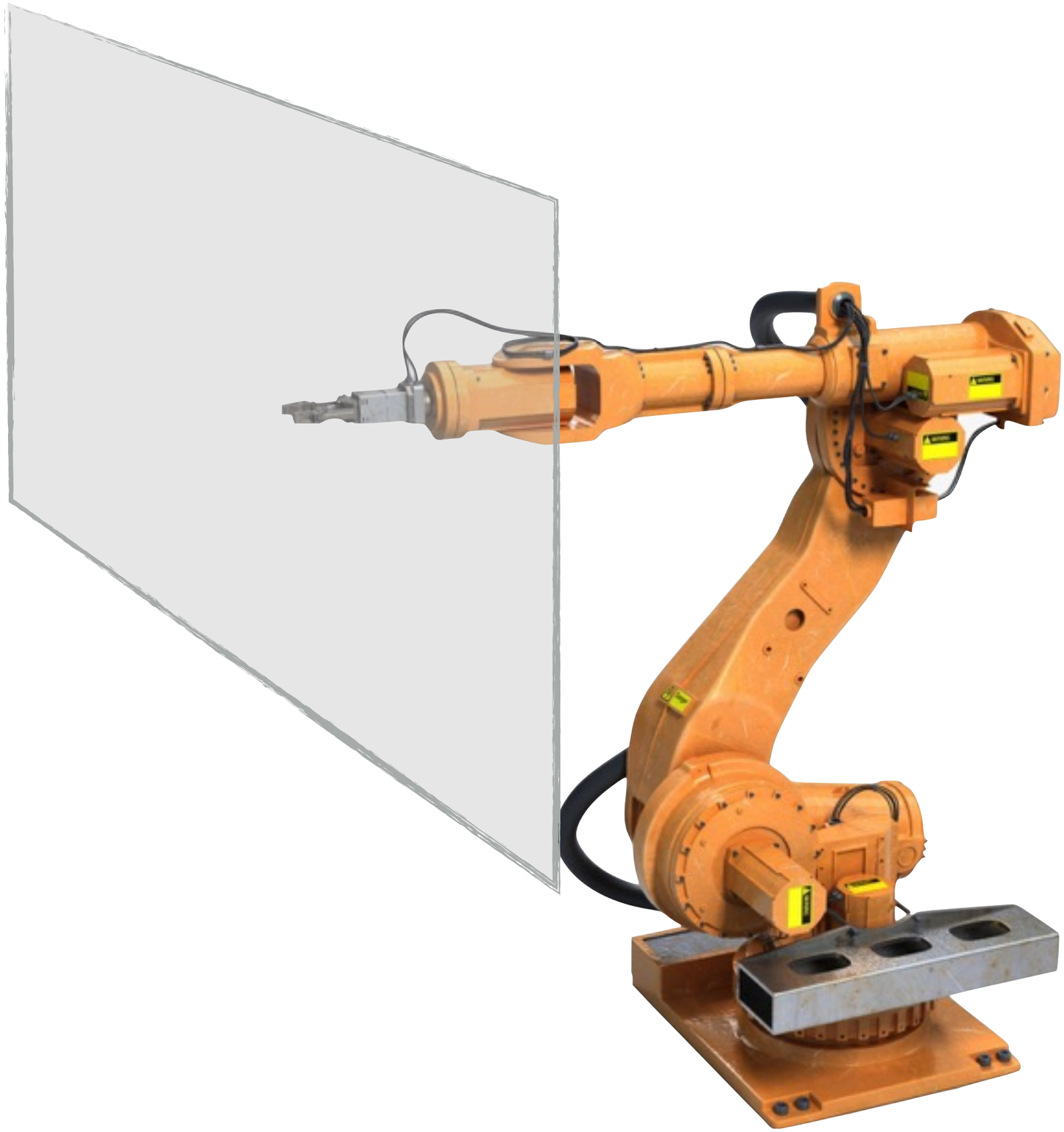
Technologies











Design properties

Devices

Degrees of freedom

Levels of perception

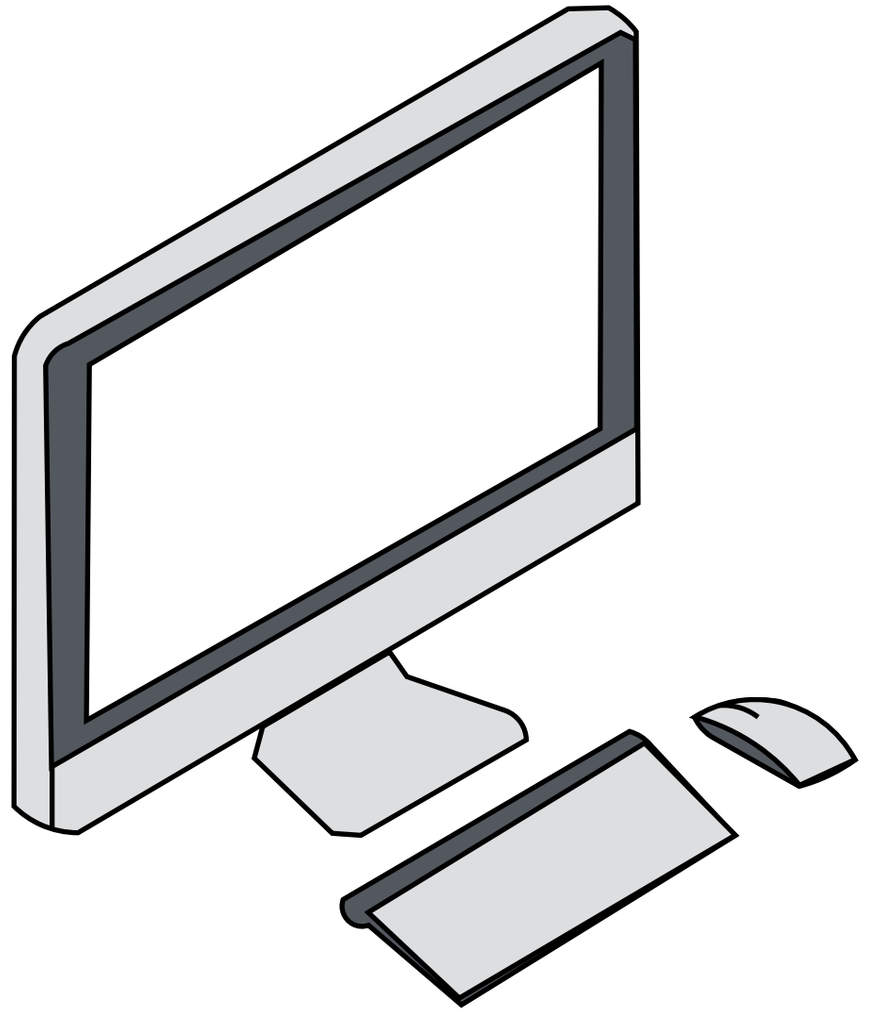
Degrees of control

Devices

Degrees of freedom

Levels of perception

Degrees of control



Devices

Degrees of freedom

Levels of perception

Degrees of control

Devices

One user

Degrees of freedom

Several users

Levels of perception

One user

Degrees of control

Not perceived

Devices

Degrees of freedom

Levels of perception

Degrees of control

Manual

Semi-manual

Semi-automatic

Automatic

Scenarios

Screen share

Video conference

Control mechanism	Degrees of control
Manual control panel	Manual
Presets	Half-manual, half-automatic
Position sensing	Automatic

Peephole

Make space

Enhanced screening

Tidy the desk

Evaluation

Video-based evaluation

Feedback about the current scenarios

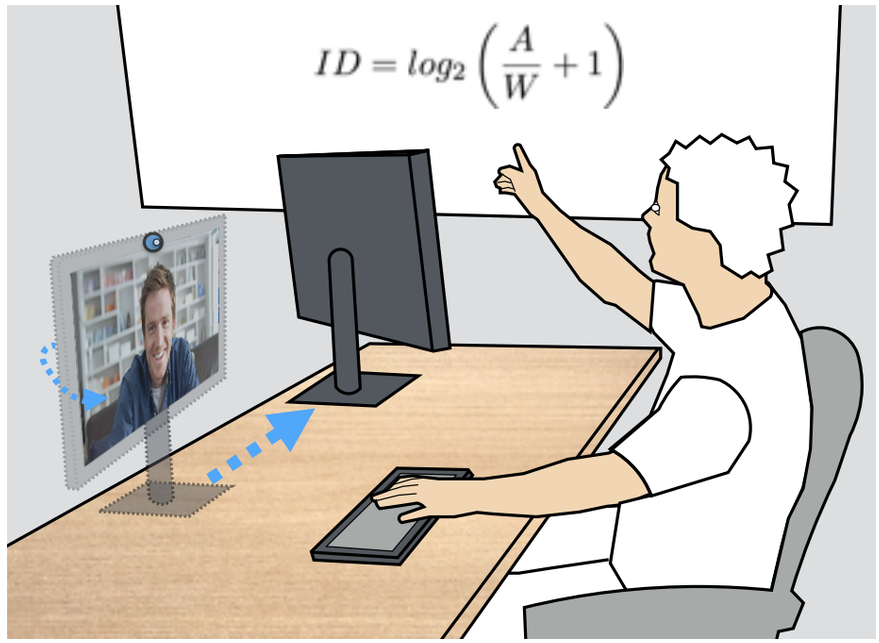
Stimulate ideas of usage and applications

Positive feedback

Video conferencing

“Very useful”, “good idea”, "rotating a monitor is […]

very cumbersome while video-conferencing"



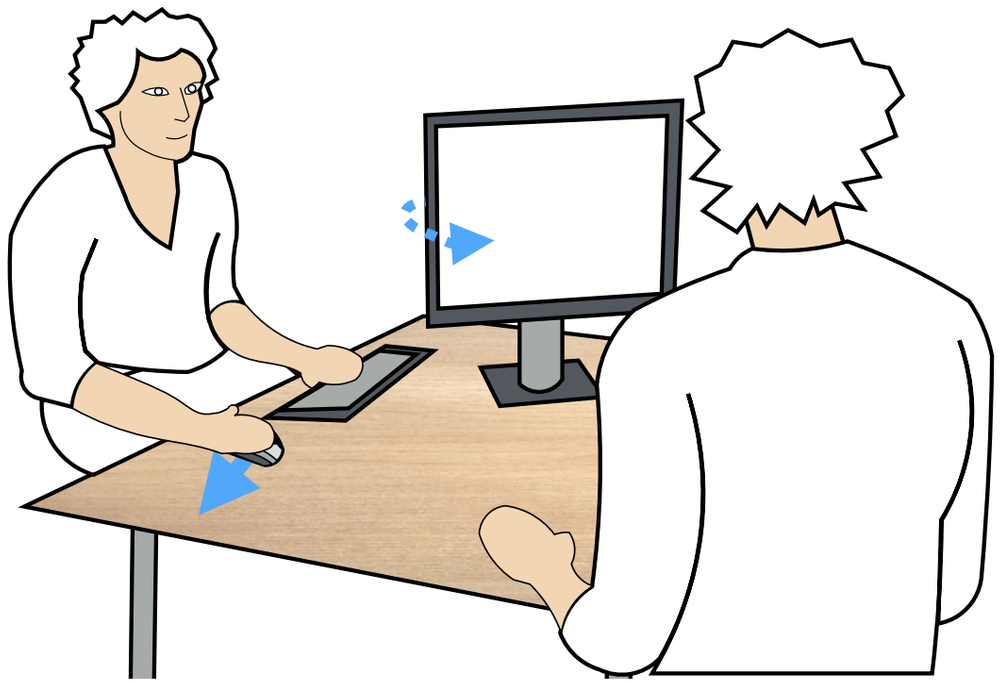
Configuring

“This could encourage many people to adopt healthier habits”

“it is a very nice way to improve the posture at work”

“it could be useful or not depending on what we are doing at the moment"

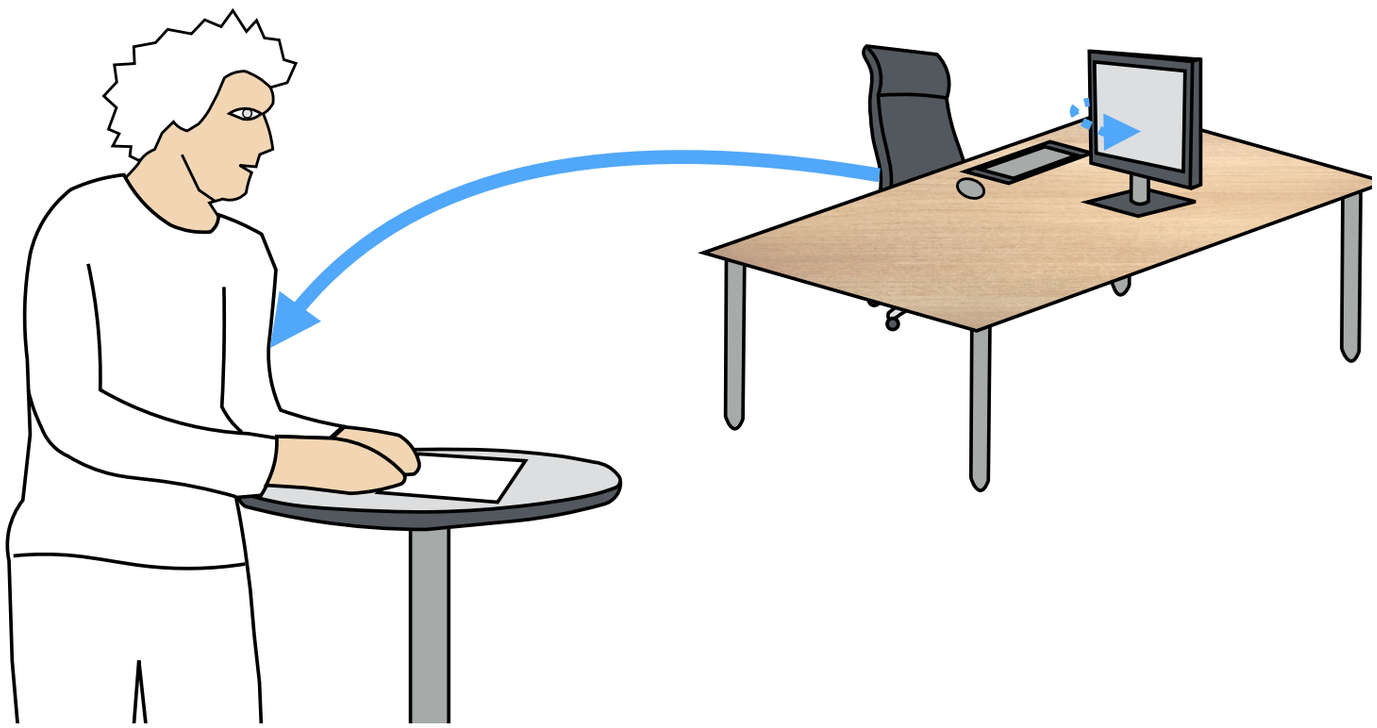
Divergent opinions



Co-Working

+ *“I think it is useful. It is very common in my job environment”*
+ *“This problem is finally solved"*
- *“I do not think it is useful because it is very easy to turn the screen”*

Negative feedback



Following

“It might be disturbing for other persons in the workspace”

Useful at home. *"The screen lights up, rotates with me and provides information"*

More scenarios

Untested techniques

Ergonomics. *"The monitor should move to not reflect the sun"*

Feedback. Remote teaching scenarios

Physicality. "*Shaking the mouse or the monitor in games*"

Others

Accessibility

Social communication

Virtual Reality

Actuating other objects such as lamp or phone

Evolutions

Device

Desktop

Room

Building

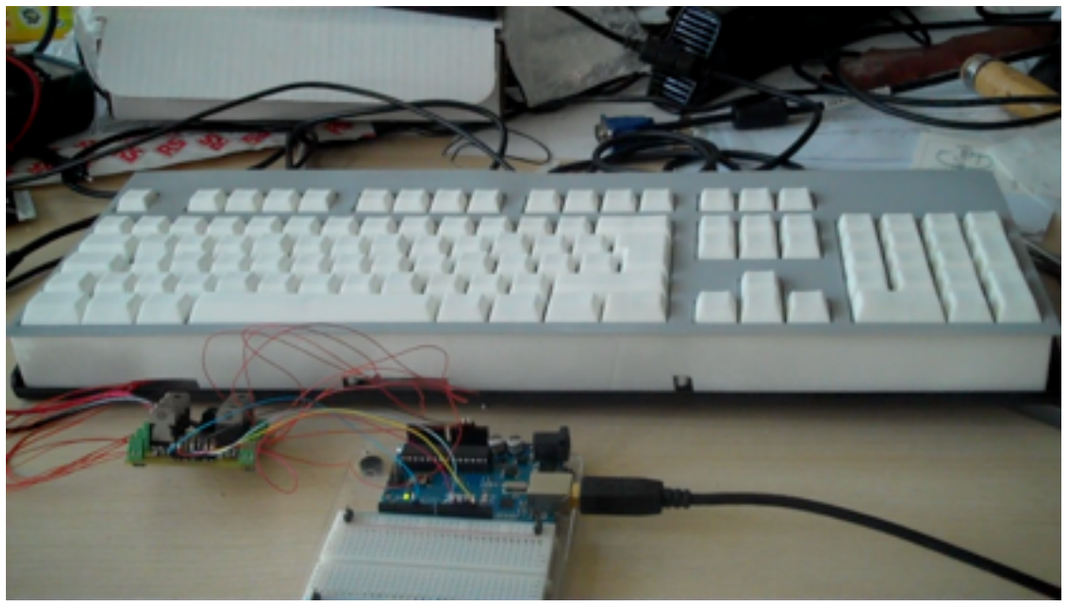
Scale of interest

Device

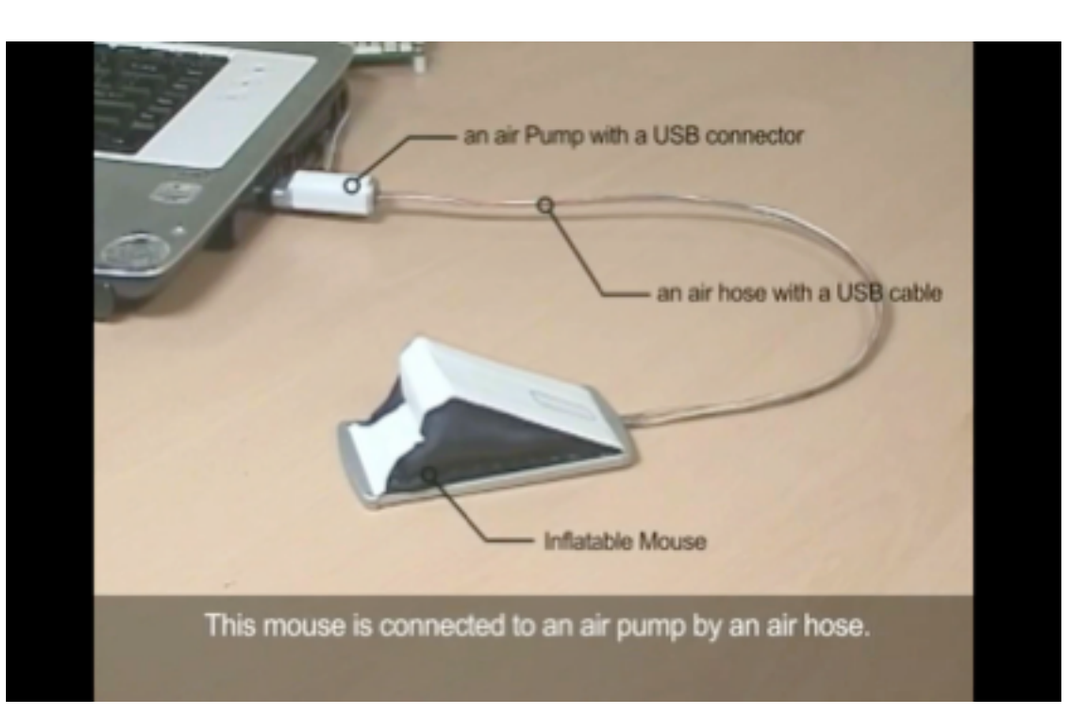
Desktop

Room

Building



Métamorphe [Bailly 2013]



Inflatable Mouse [Kim 2008]

Device

Desktop

Room

Building

Device

Desktop

Room

Building

Nissan’s parking chair 2016

Device

Desktop

Room

Building

Clocky alarm on wheels

Device

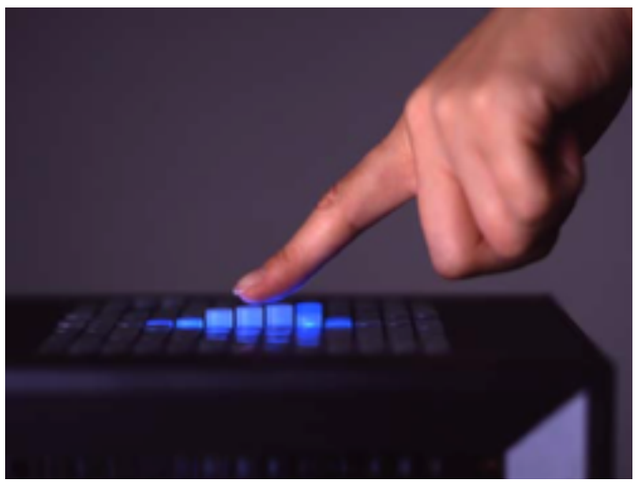
Desktop

Room

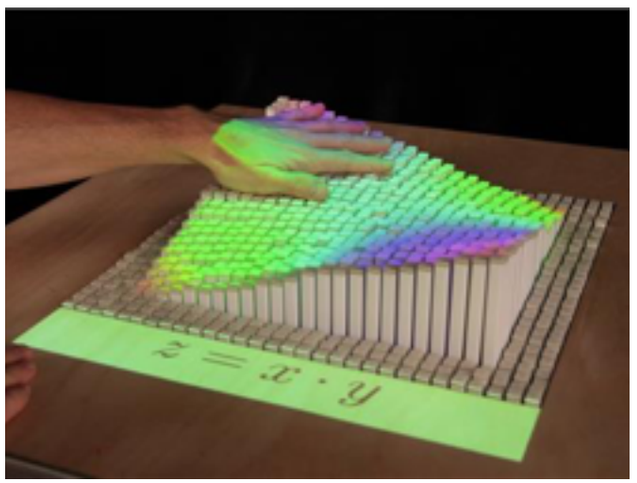
Building

The Rotating House, Australia

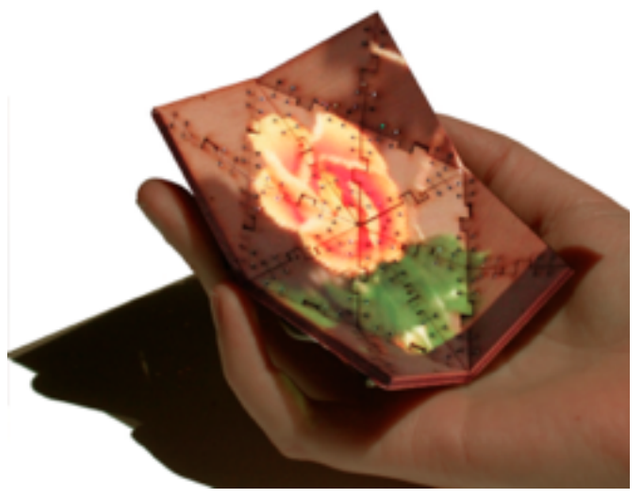
Conclusion



Lumen
[Poupyrev 2004]



InFORM
[Leithinger 2013]



Morphees
[Roudaut 2013]

HCI just started to explore
possible applications of actuated objects

Contributions

Proof-of-concept augmented desktop with actuated devices

Applications based of the findings of a formative study

Findings of a scenario evaluation

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