Input Techniques

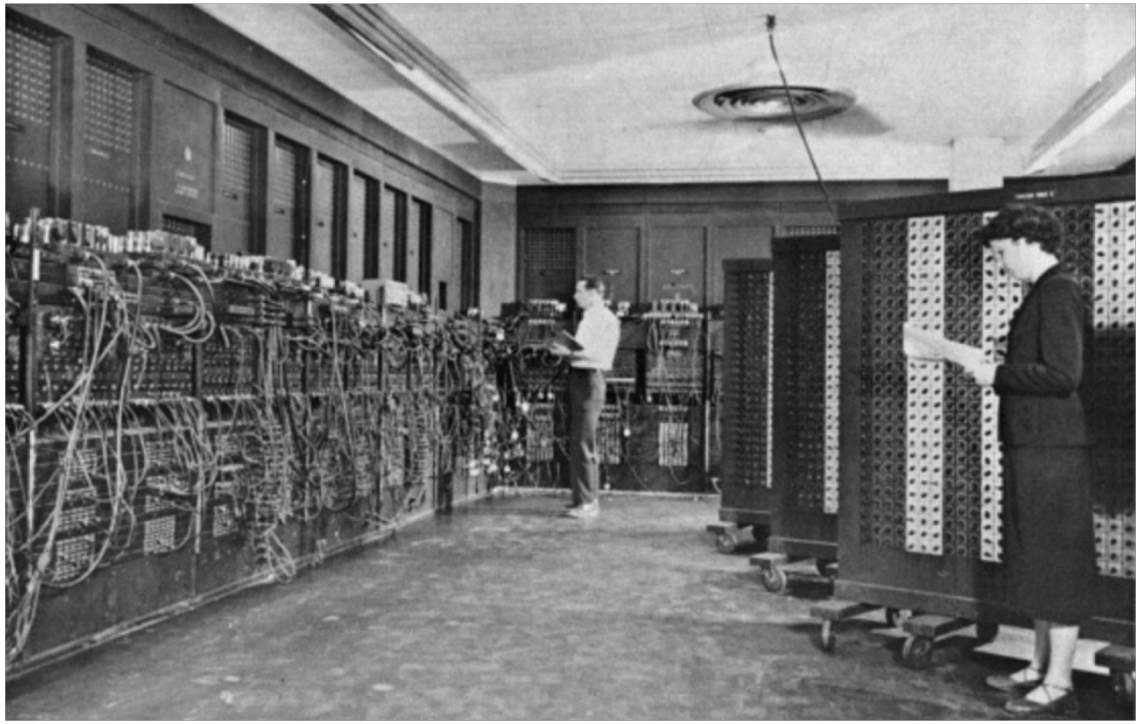
No screens

Prof. Lydia Chilton

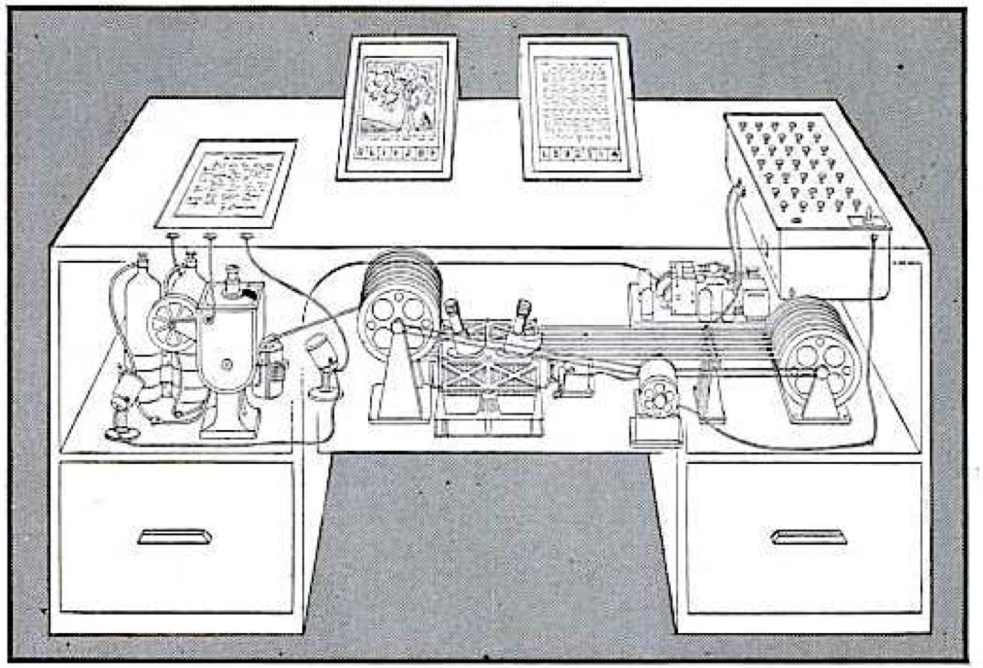
COMS 4170

6 March 2019

Computers: Tools for calculation.



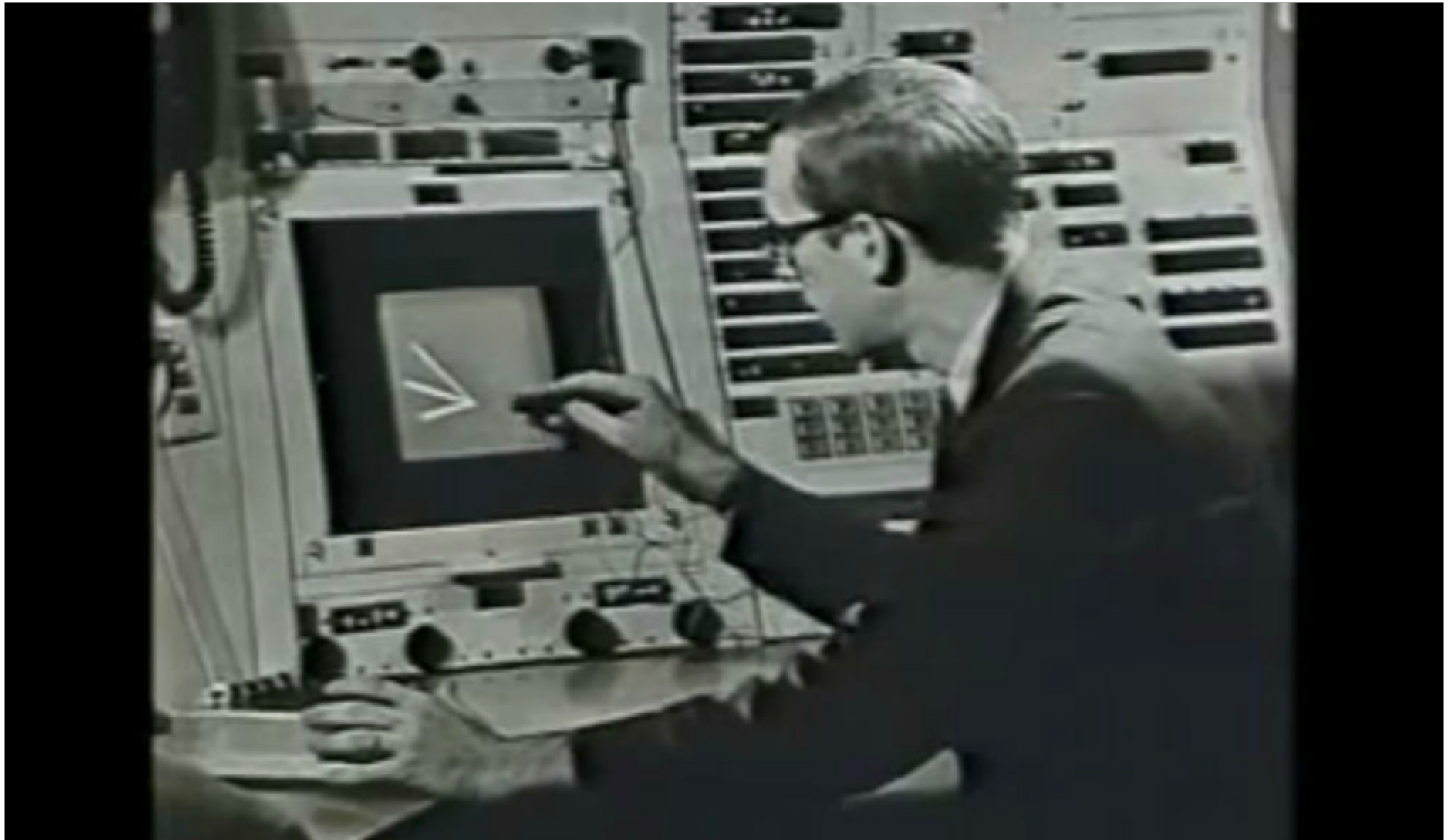
Computers: Tools to augment human intelligence.



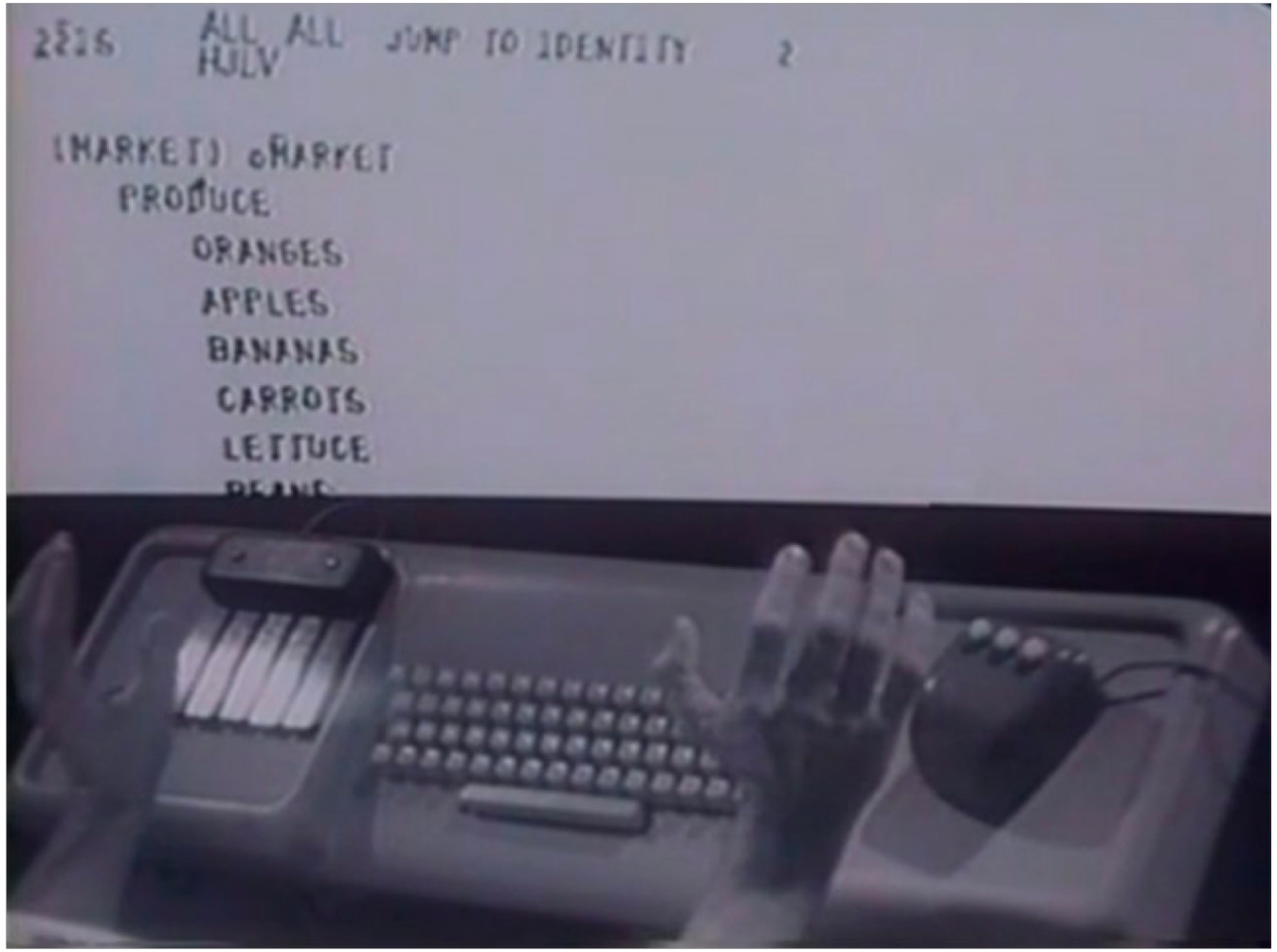
MEMEX in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference.

AS WE MAY THINK CONTINUED

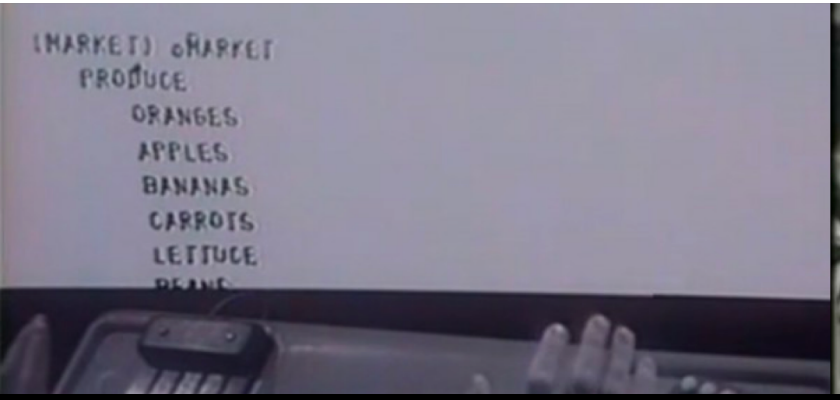
1963: First Graphical User Interface
Ivan Sutherland's CAD software, Sketchpad

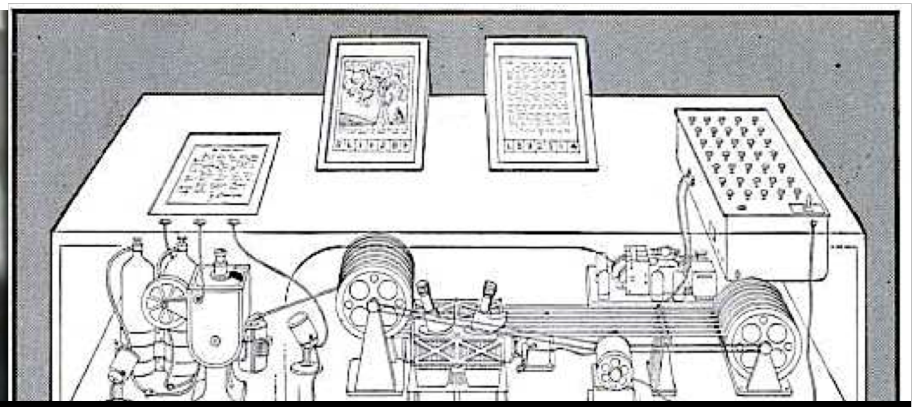


1968: Interaction devices for computer use. Douglas Engelbart's mouse



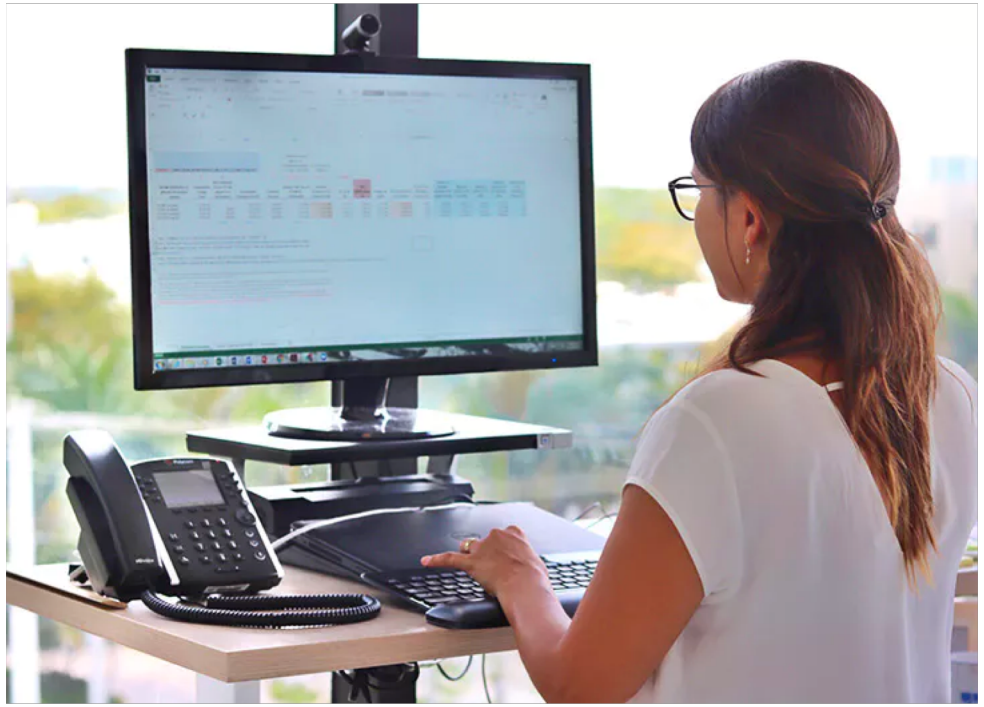
The keyboard, mouse, and pen are good tools for manipulating information on a screen.





Can changing the physical mode of input augment our abilities?

Challenge: Make Computing more physical



Move away from this…

Put computing into the real world

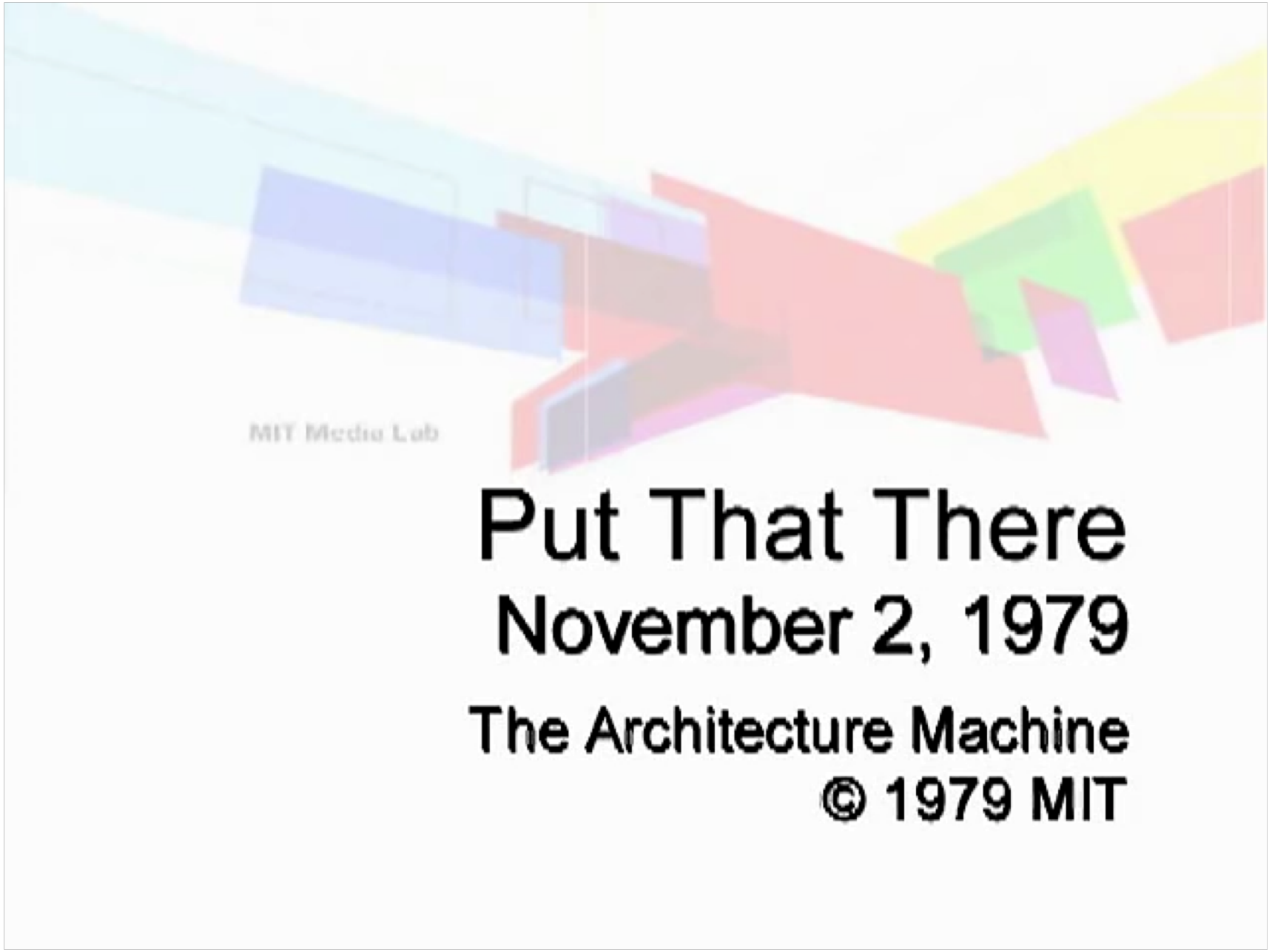
Smart Phones

What **physical abilities** does it use?

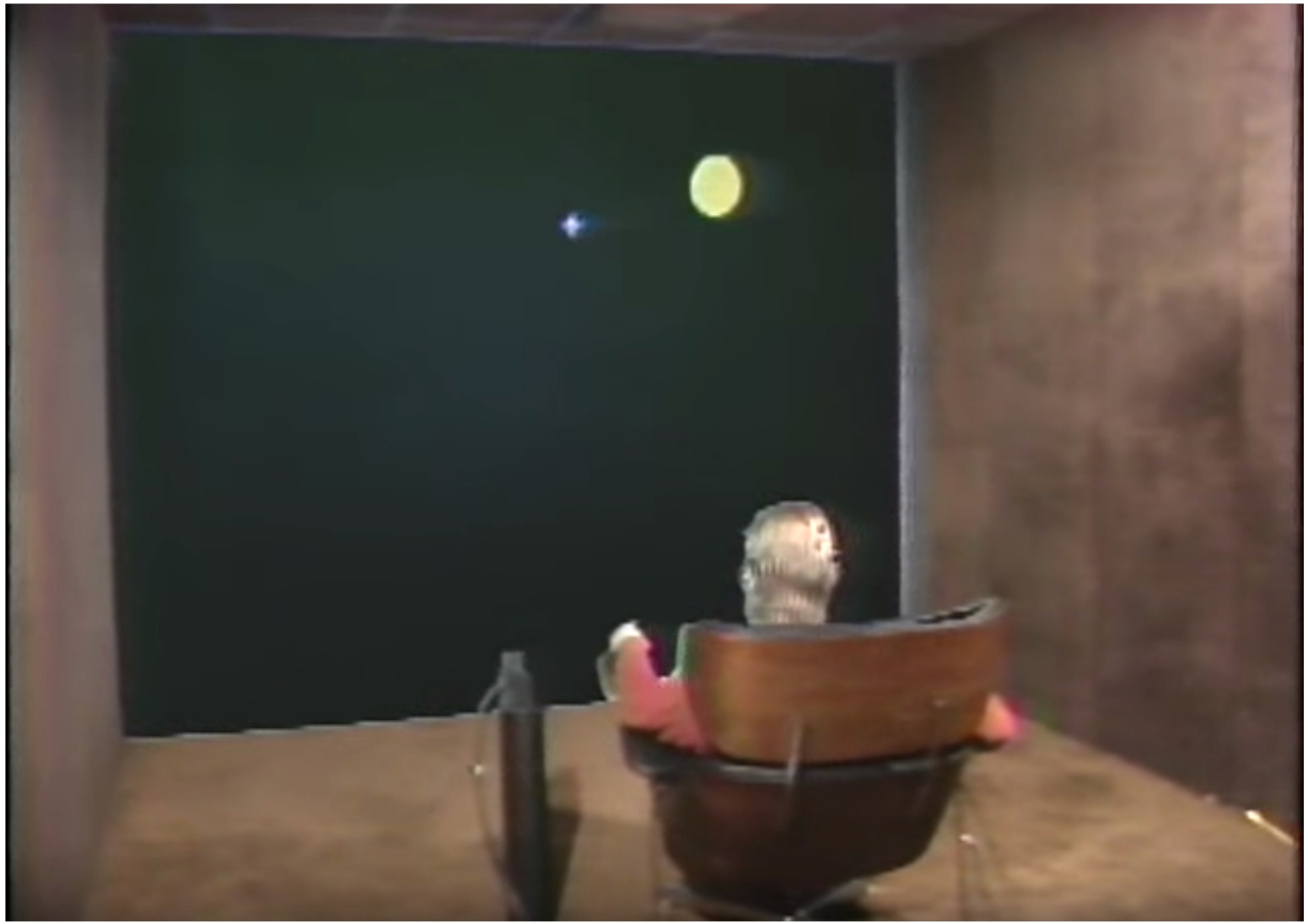
What **needs** does it satisfy?

What **challenges** does it pose?

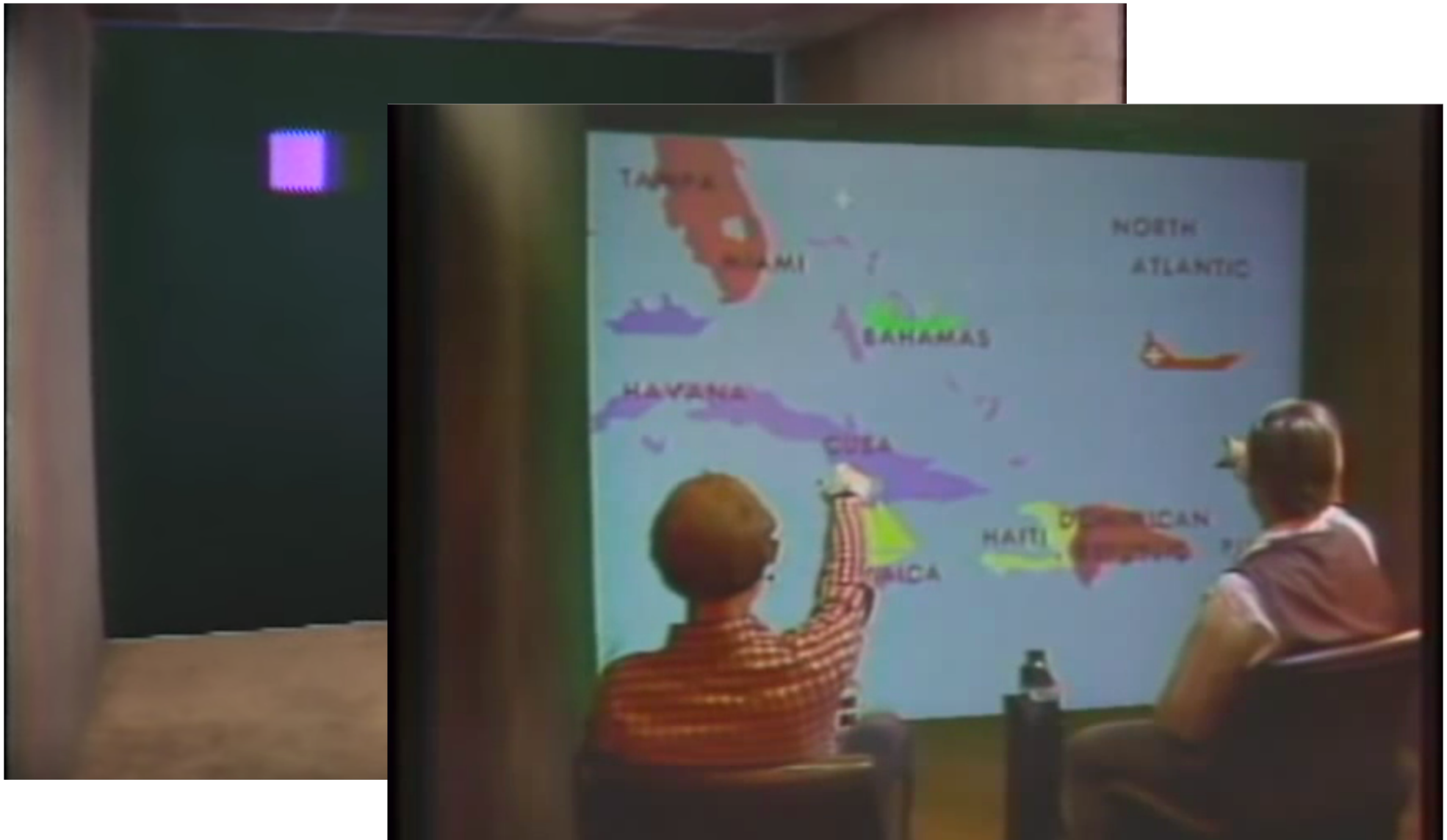
Wall Displays


MIT Media Lab
Put That There
November 2, 1979
The Architecture Machine
© 1979 MIT

What **physical abilities** does this use?



What **needs** does it satisfy?



What **challenges** does it pose?

Wall displays:
Allow us to use **voice** and **pointing**
To manipulate objects far away

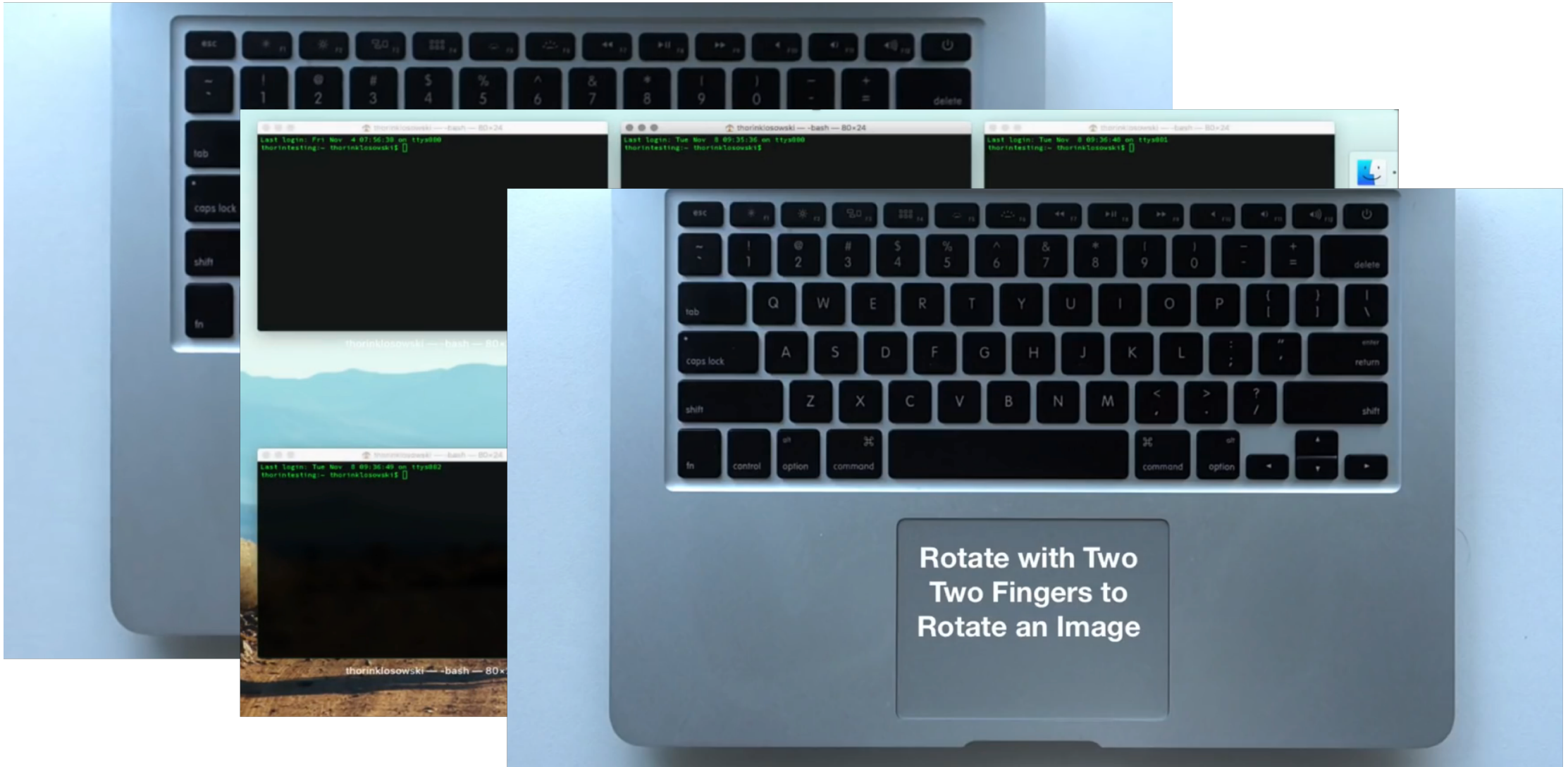
MultiTouch Trackpad

10 MacBook Gestures that
Save You Time

What **physical abilities** does this use?

What **needs** does it satisfy?

What **challenges** does it pose?



Multi-Touch uses
small finger gestures to
manipulate object that are difficult to name

Spoken Language Interfaces

What **physical abilities** does this use?

What **needs** does it satisfy?

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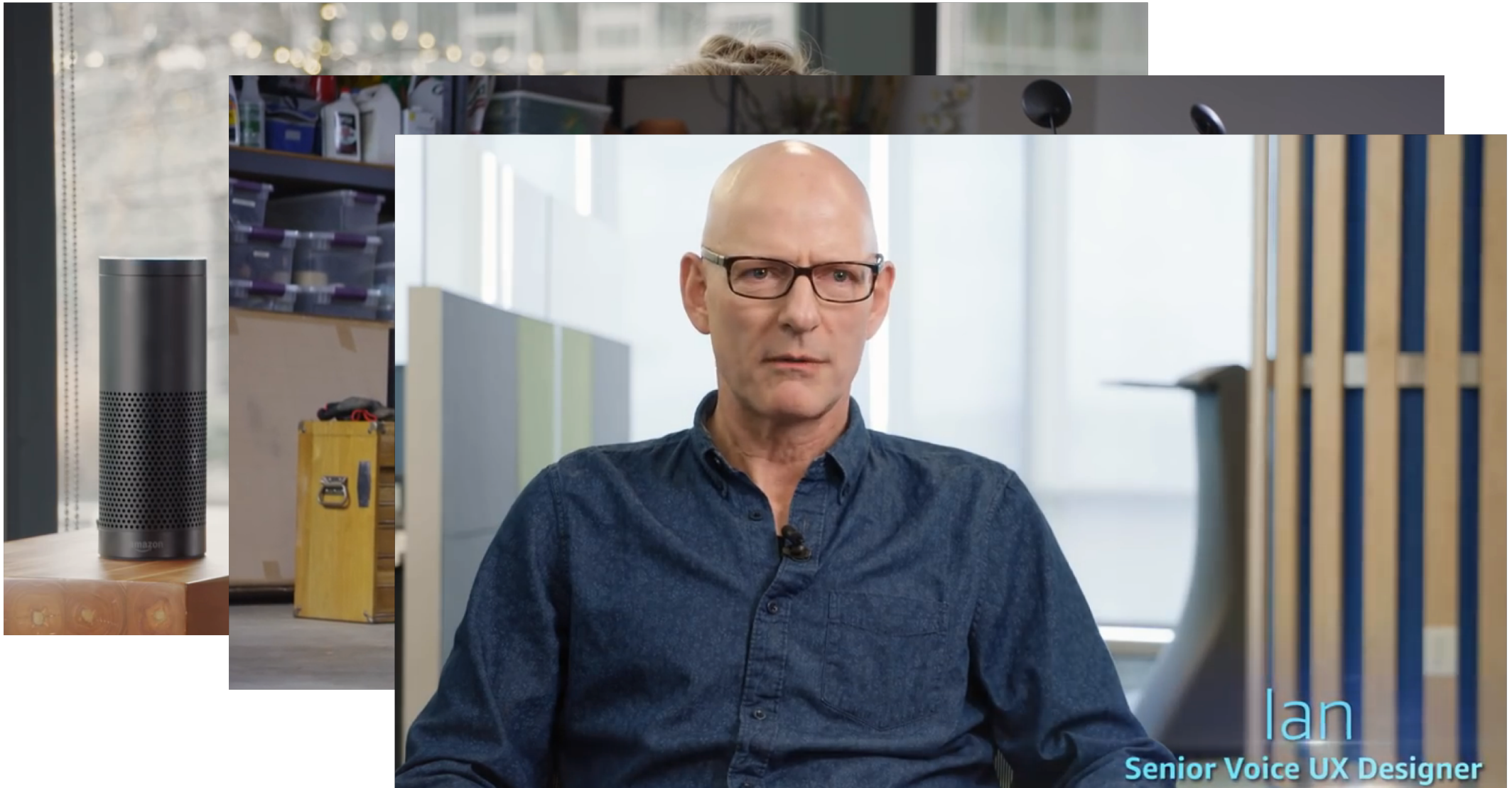


Spoken language interfaces allow us to use **voice** when:
we are **in the next room**,
and when their **hands are busy**
and when they are **looking at something else.**

Full Body Sensor

What **physical abilities** does this use?

What **needs** does it satisfy?

What **challenges** does it pose?

Body sensors can
all your express motions with your full body to
manipulate objects on the screen

Virtual Reality

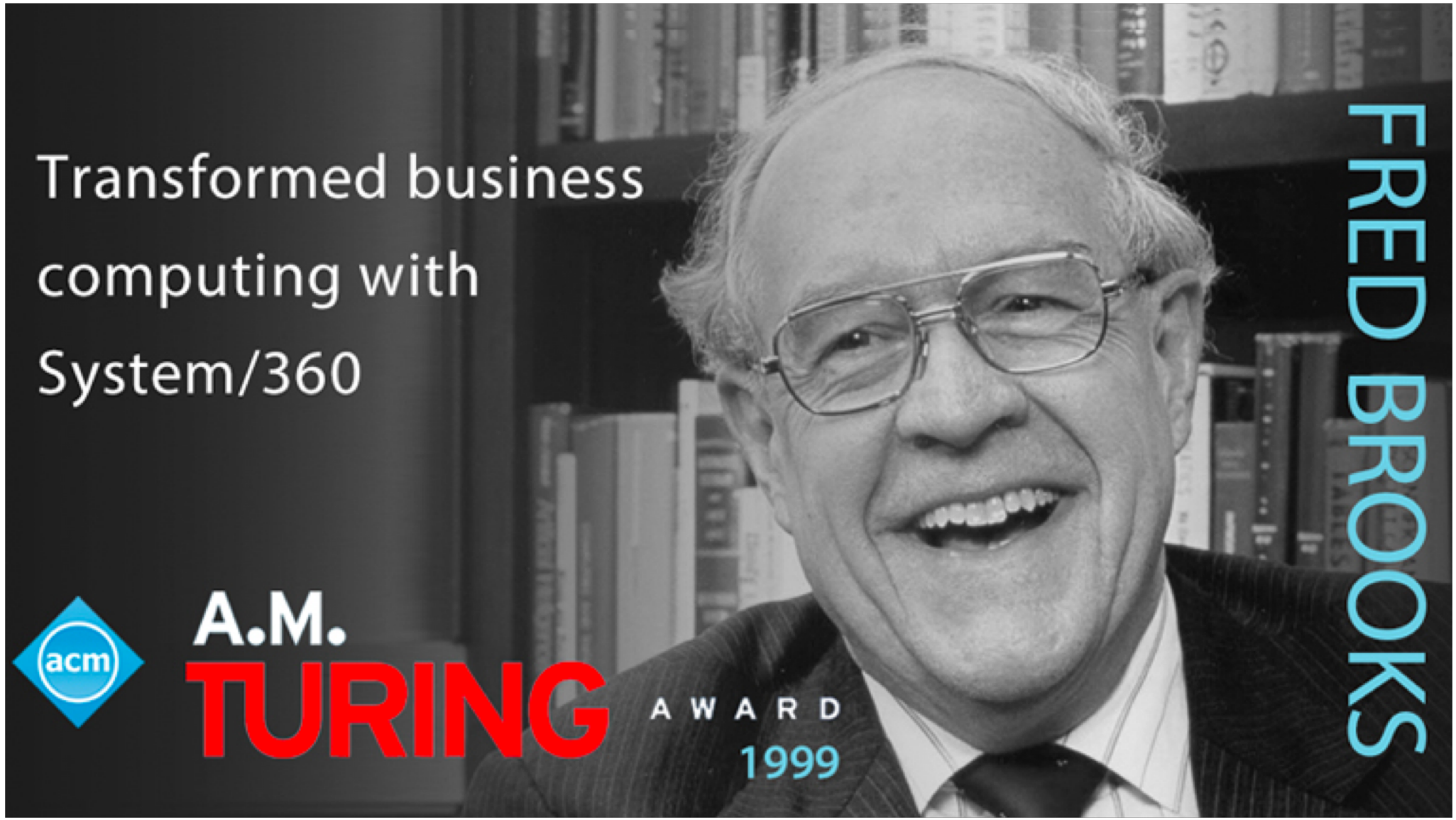
Circa 1991

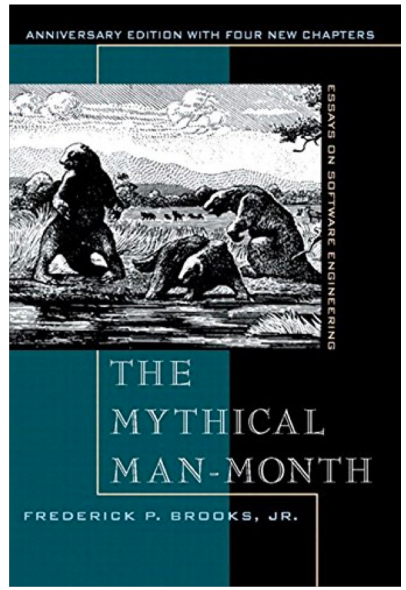
00:40:24

What **physical abilities** does this use?

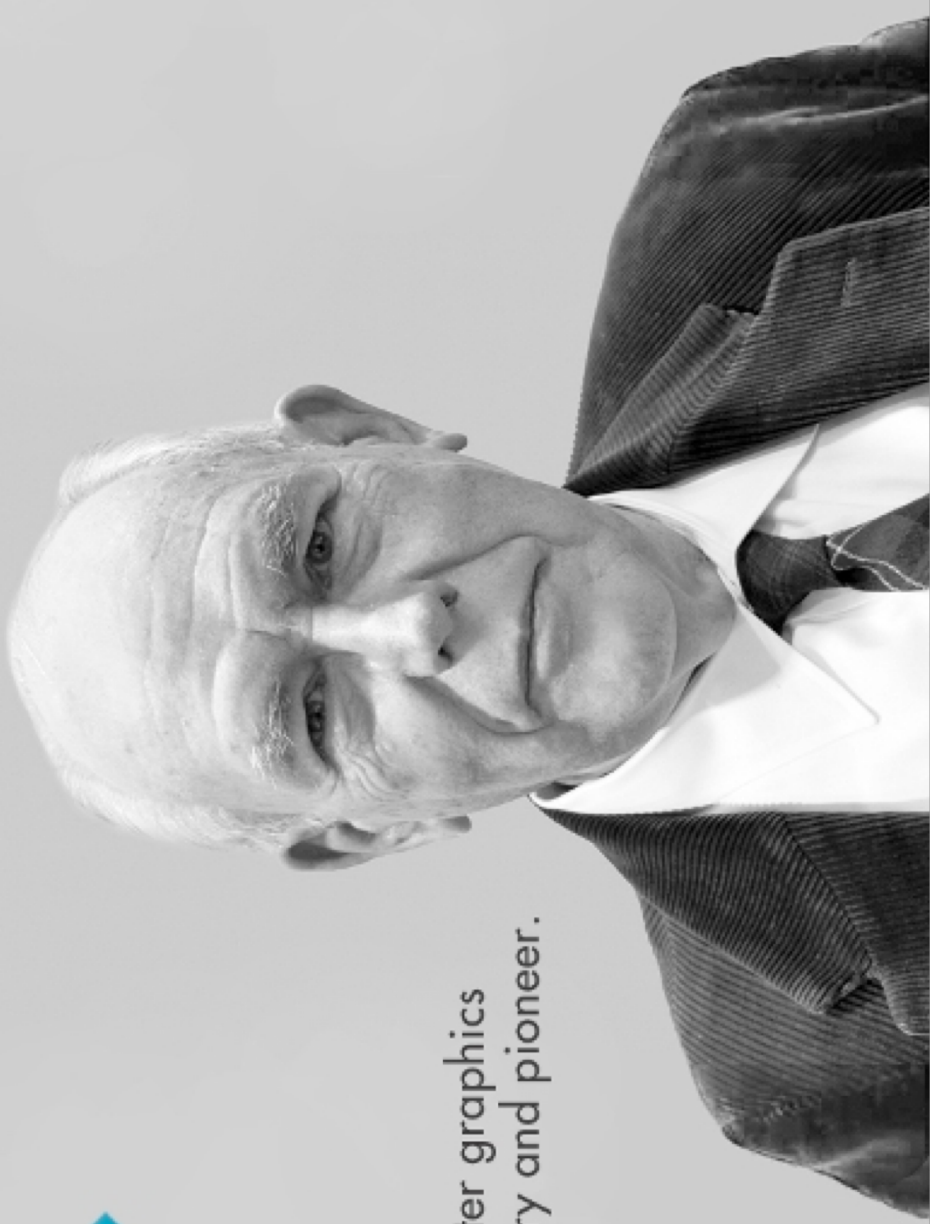
What **needs** does it satisfy?

What **challenges** does it pose?


Transformed business
computing with
System/360
FRED BROOKS
acm
A.M.
TURING
AWARD
1999


ANNIVERSARY EDITION WITH FOUR NEW CHAPTERS
ESSAYS ON SOFTWARE ENGINEERING
THE
MYTHICAL
MAN-MONTH
FREDERICK P. BROOKS, JR.

IVAN SUTHERLAND



Computer graphics
visionary and pioneer.

A.M.
TURING
AWARD
1988

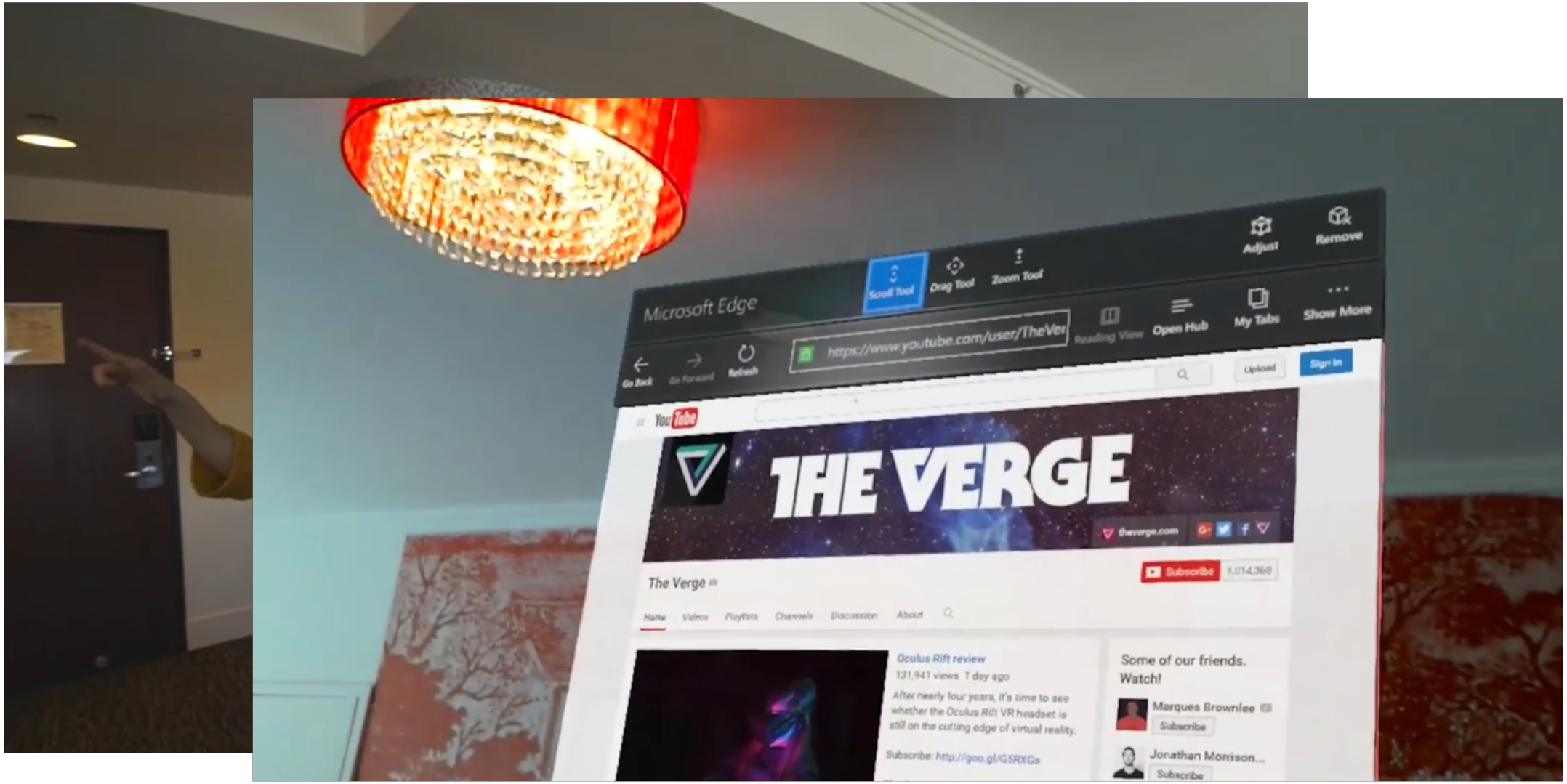
Virtual Reality can saturate our vision to give immersive experiences of a new world

Augmented Reality

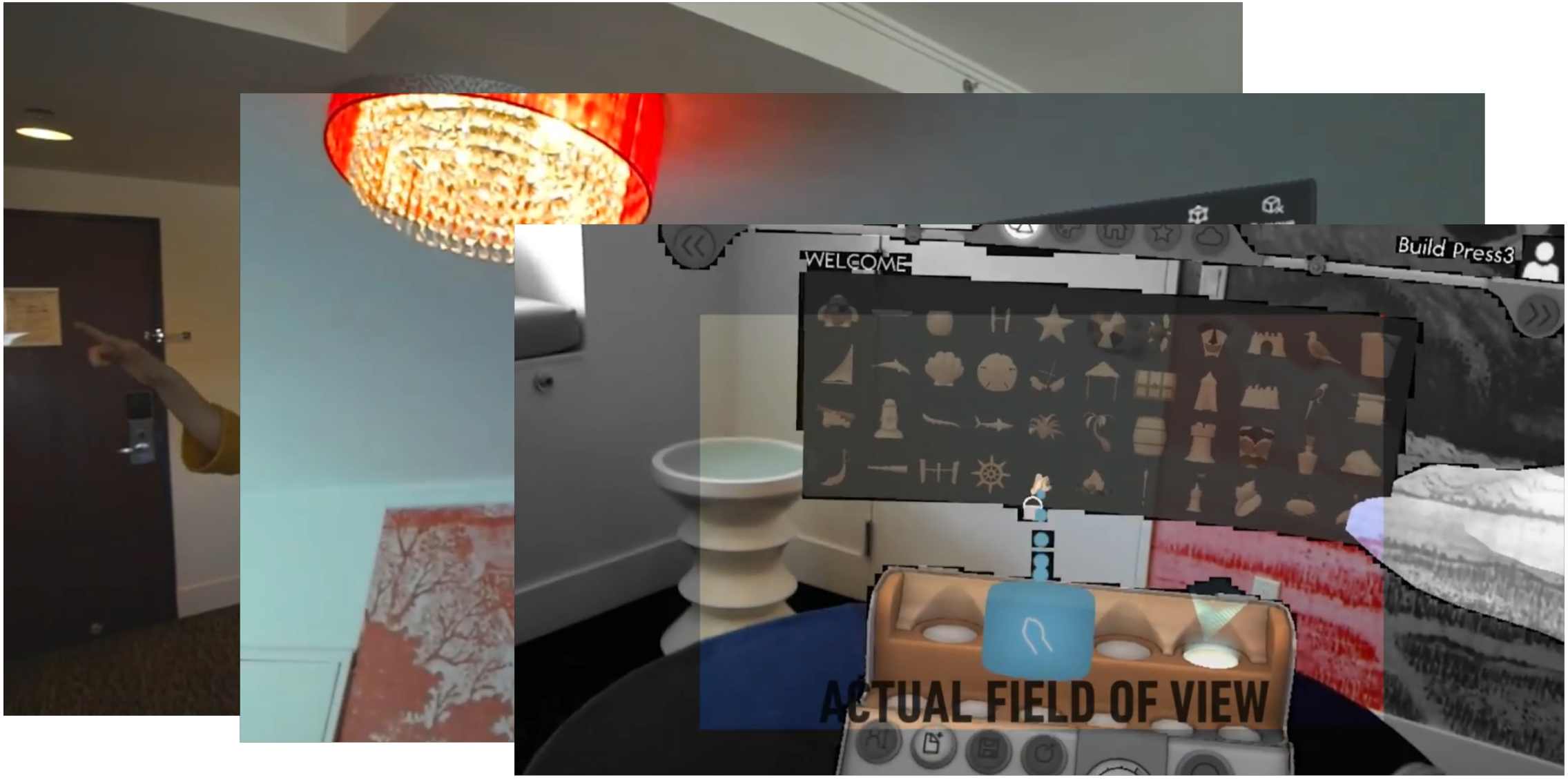
Microsoft HoloLens

What **physical abilities** does this use?

What **needs** does it satisfy?



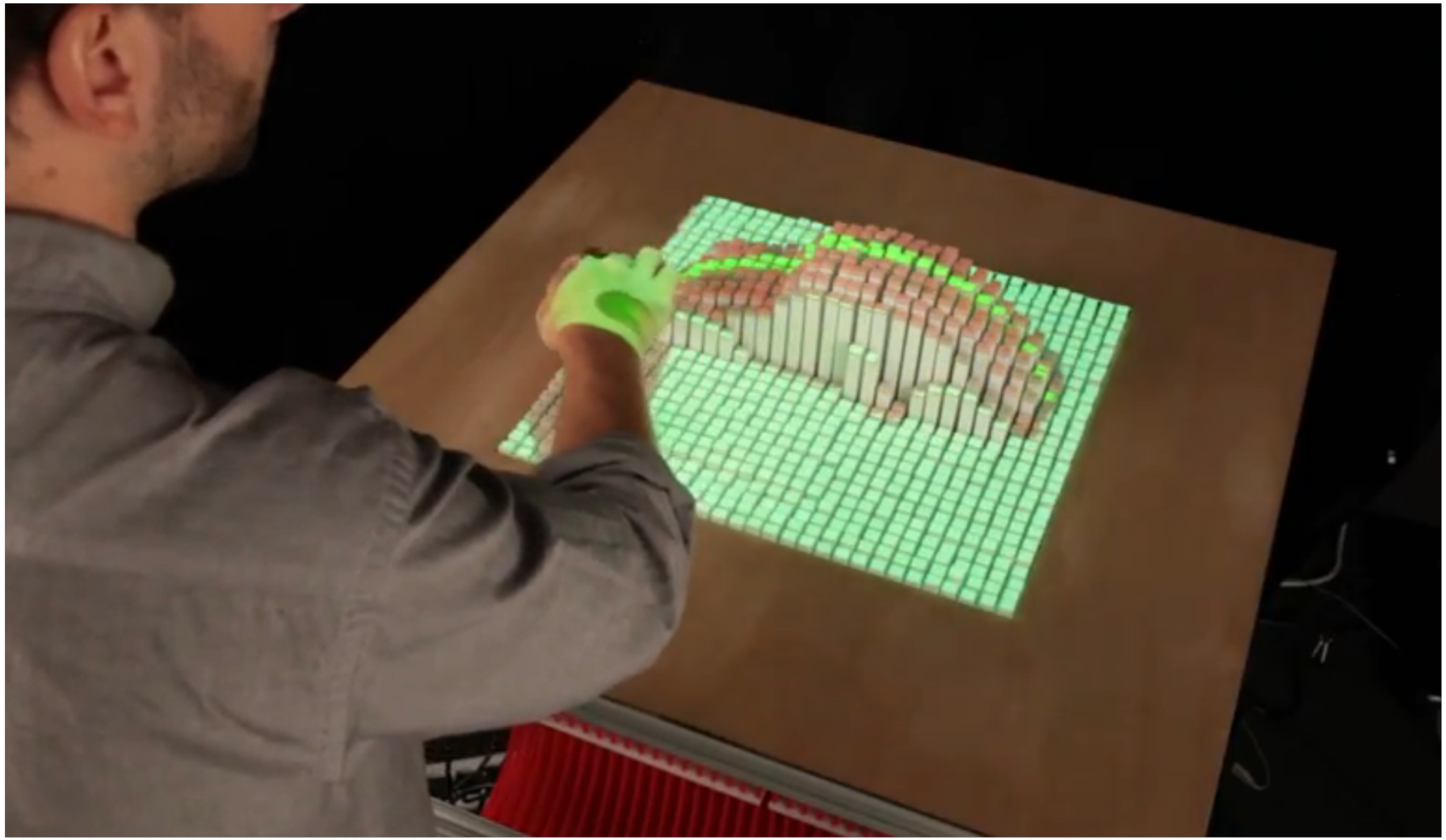
What **challenges** does it pose?



Shape changing displays

Research prototype

What **physical abilities** does this use?



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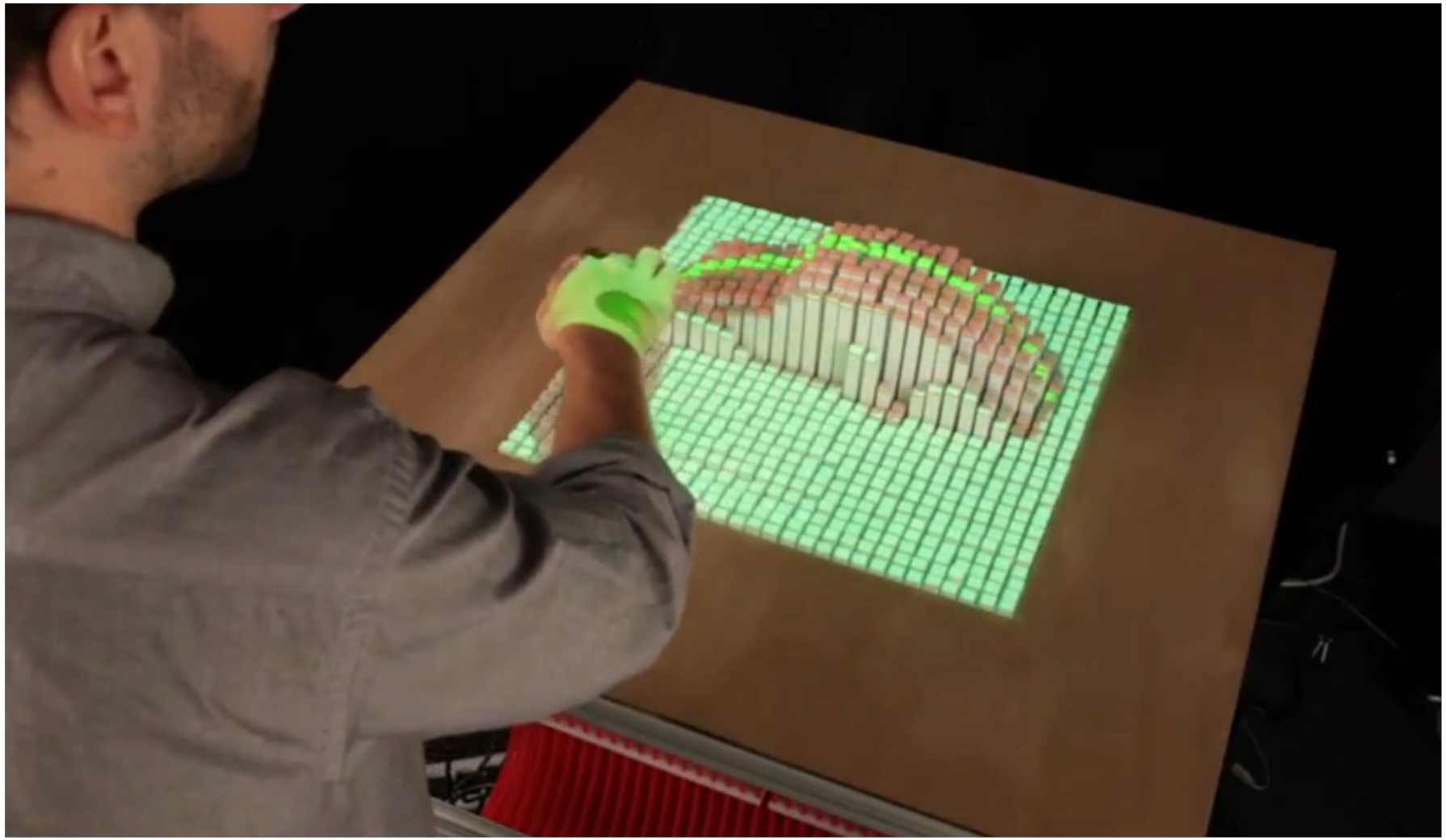

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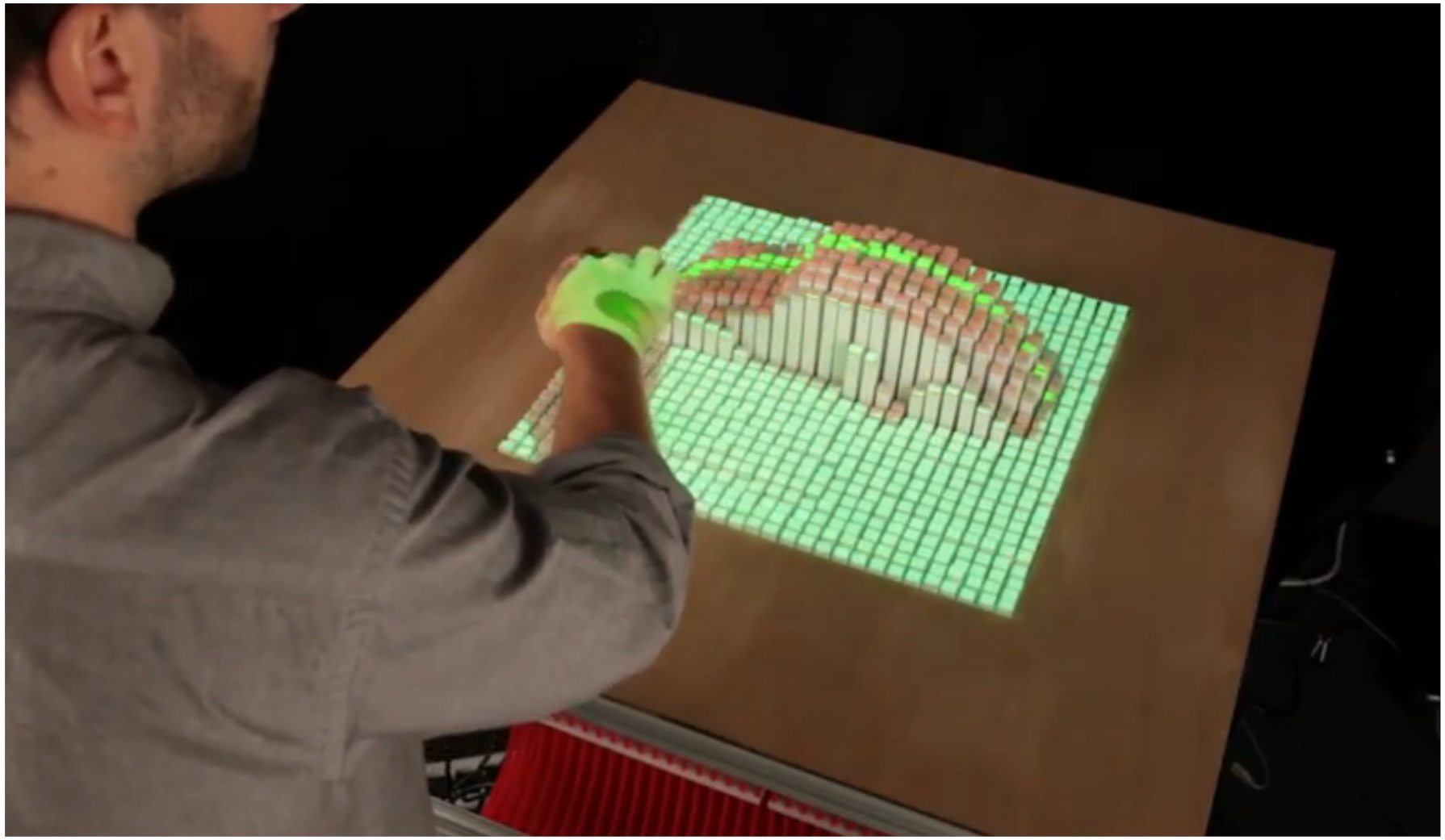
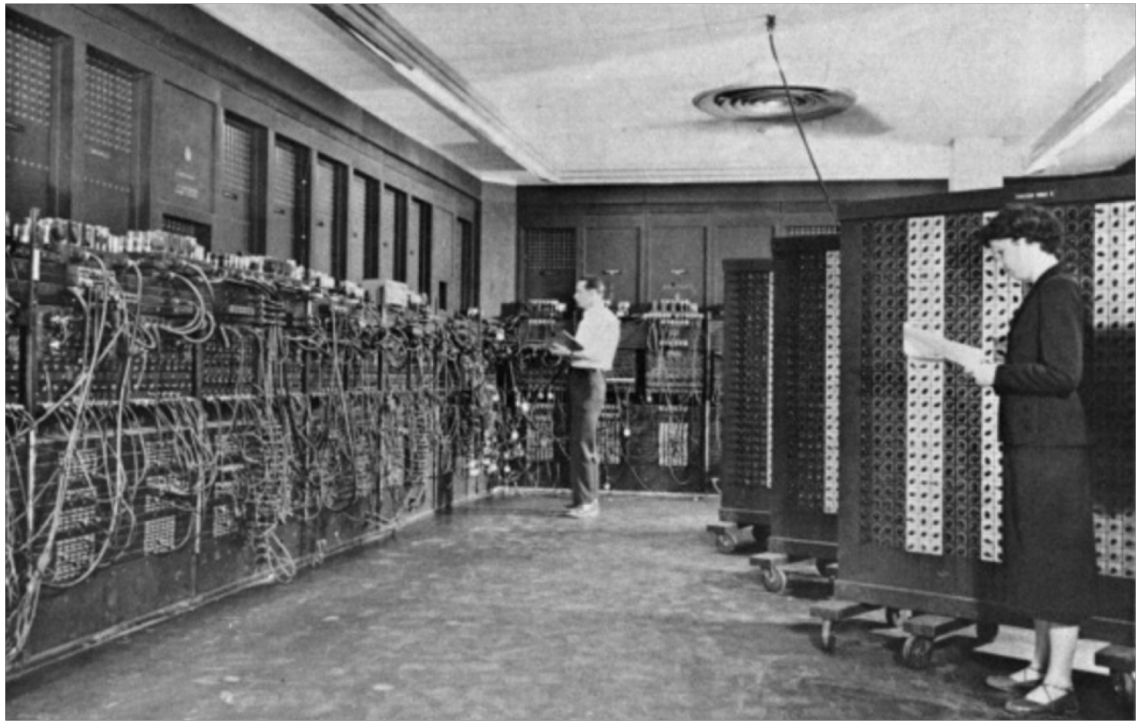


Summary

Computers: Tools for calculation.



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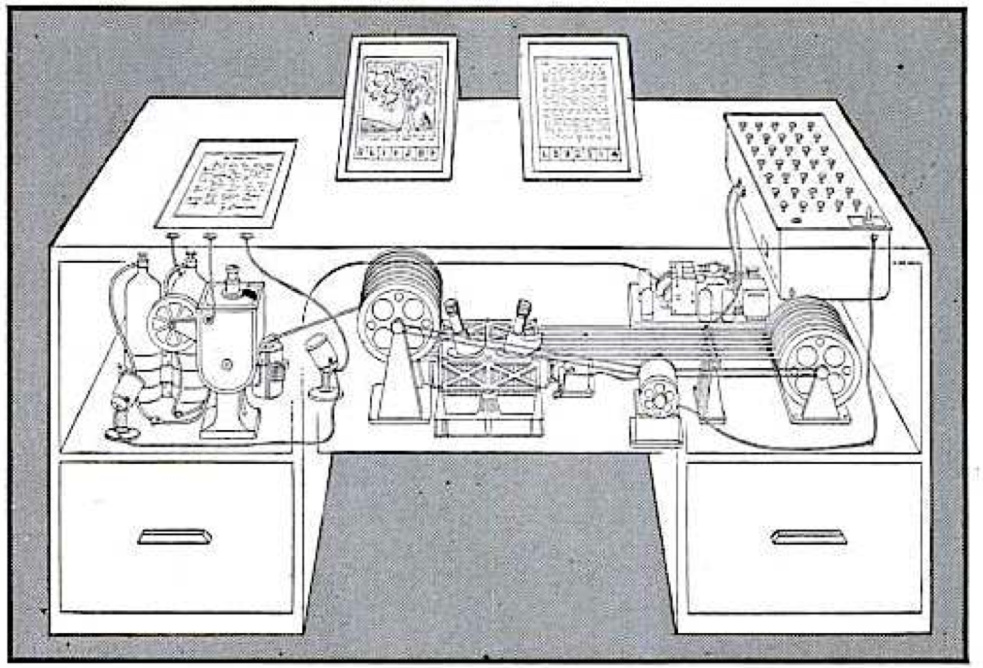

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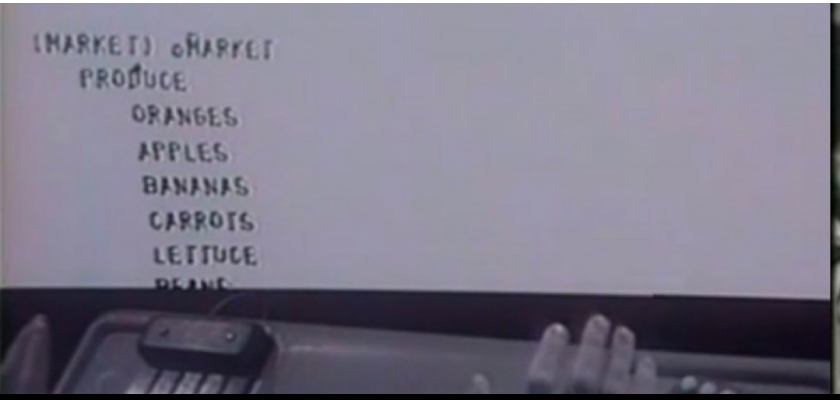
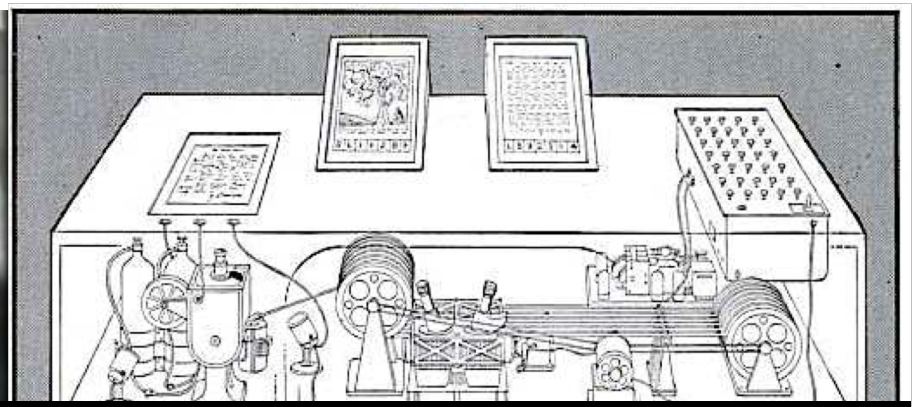
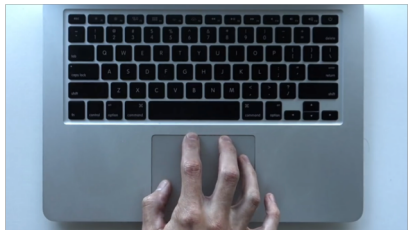
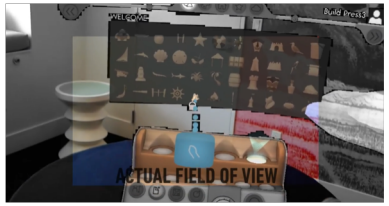




Can changing the physical mode of input augment our abilities?

Specialized devices can use our **wide range of physical abilities** to meet **needs in physical world**





Input Device	Ability	Need
Wall Display	Long range pointing	Manipulate shared, remote displays Comfortably
Track pad/ Touch devices	Finger gestures	Controls that are hard to speak (visual operations, largely)
Spoken Language systems	Speak/Listen	Operate devices remotely (or while hands are busy)
Video overlay headset	Vision, motion	Overlay information on the real world