
Future Human-Machine Interfaces
Joao Pequenao
CERN Media Lab
27 February 2018


Some Landmarks
In H-M Interfaces
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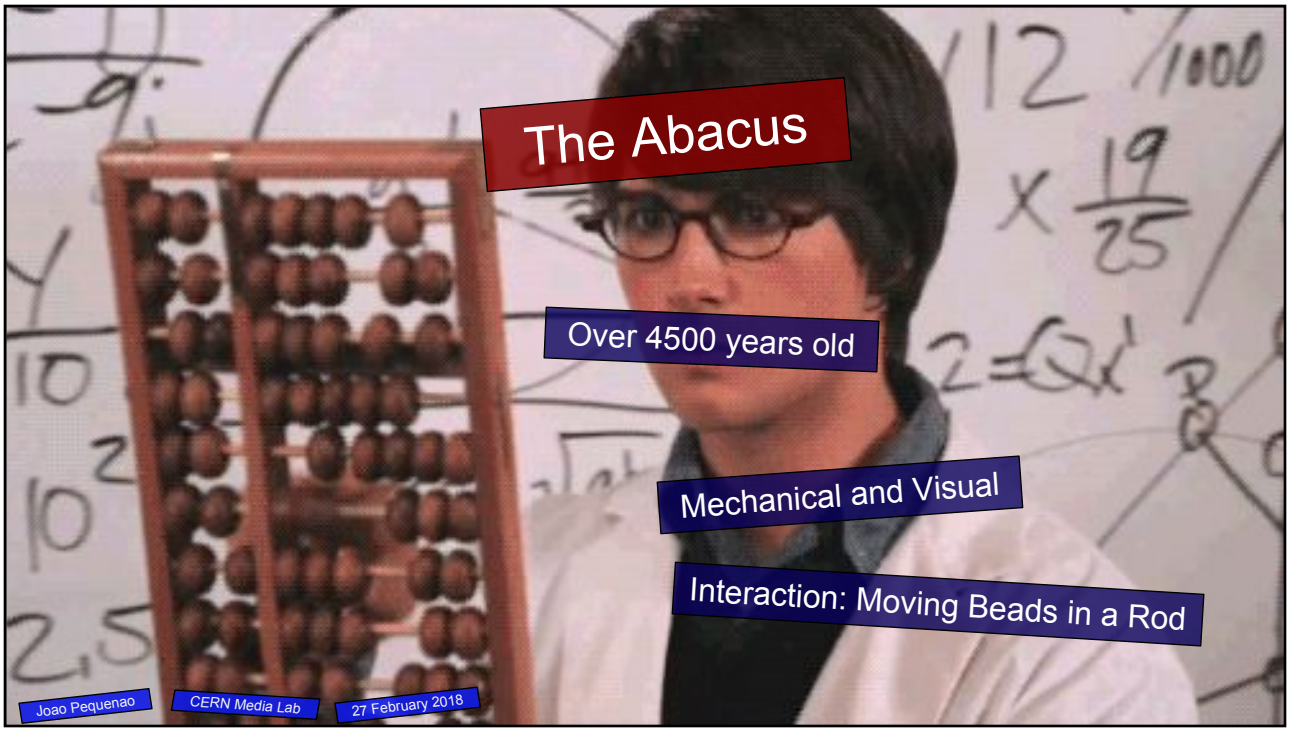
27 February 2018


The Abacus
Over 4500 years old
Mechanical and Visual
Interaction: Moving Beads in a Rod
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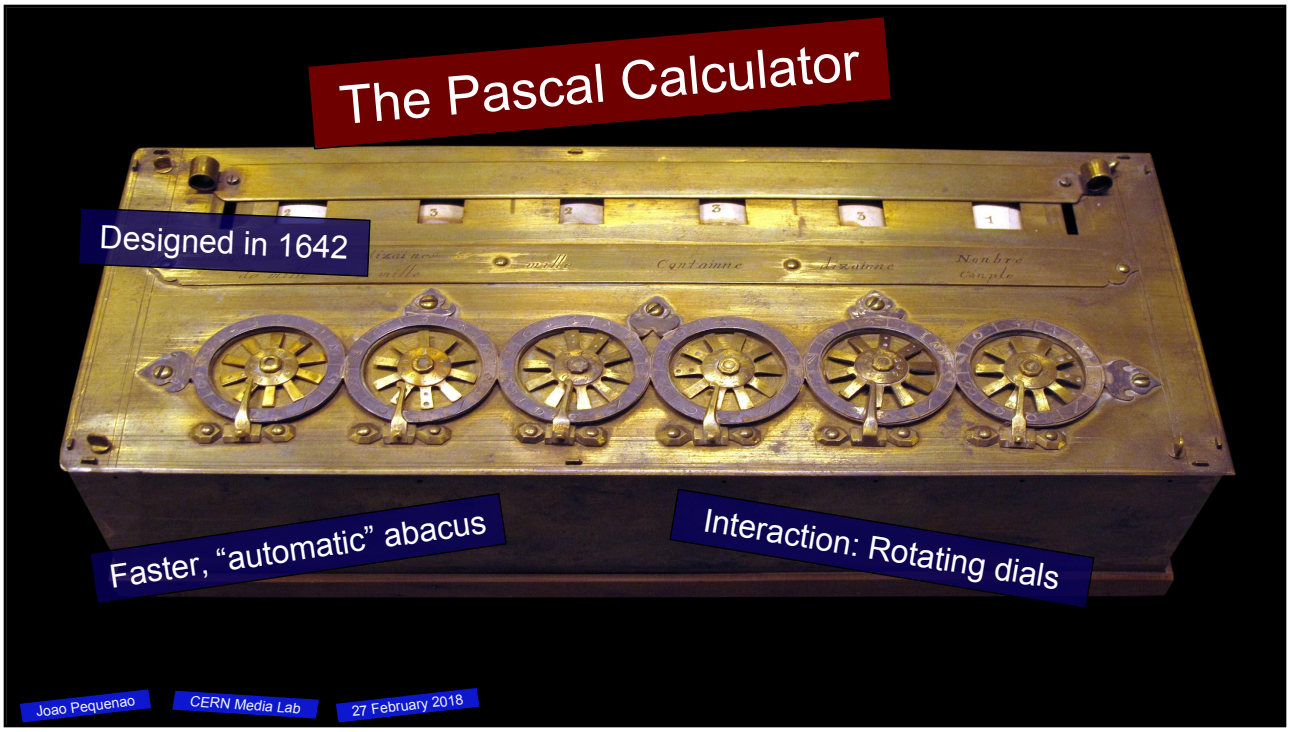
The Pascal Calculator
Designed in 1642
Faster, “automatic” abacus
Interaction: Rotating dials
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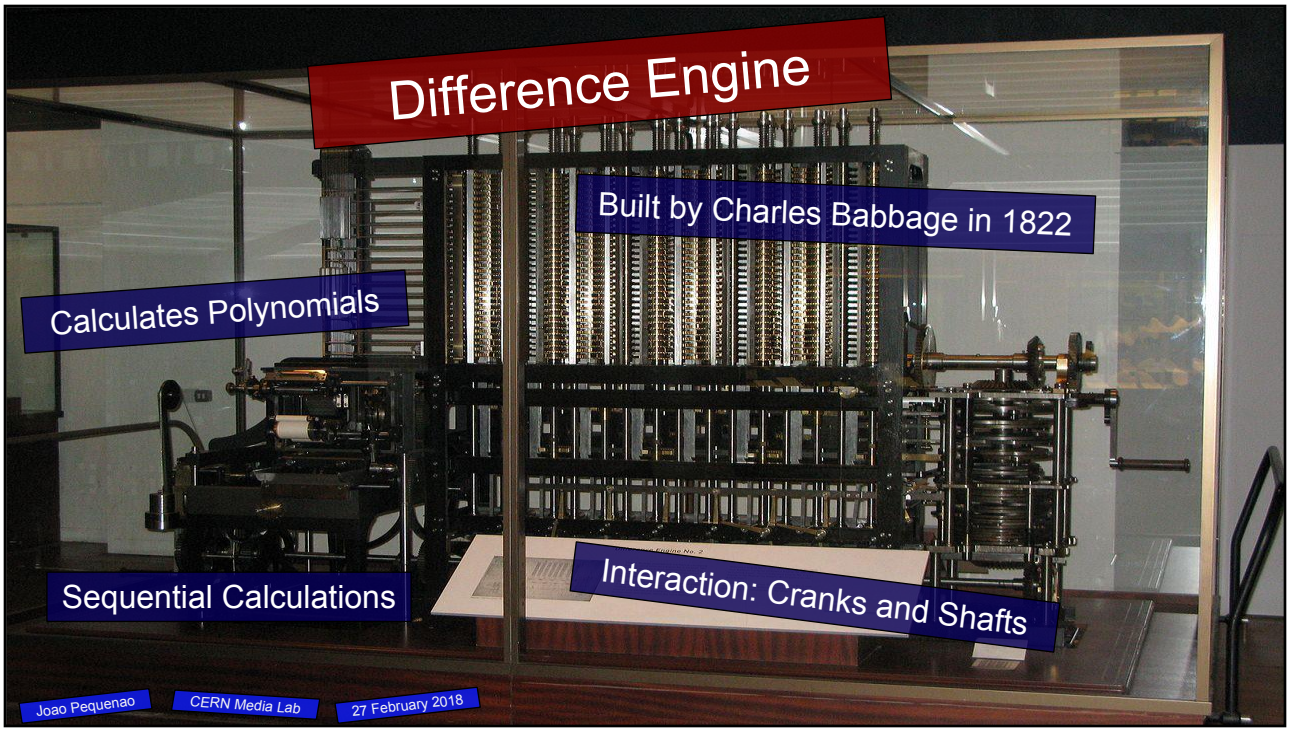
Difference Engine
Built by Charles Babbage in 1822
Calculates Polynomials
Sequential Calculations
Interaction: Cranks and Shafts
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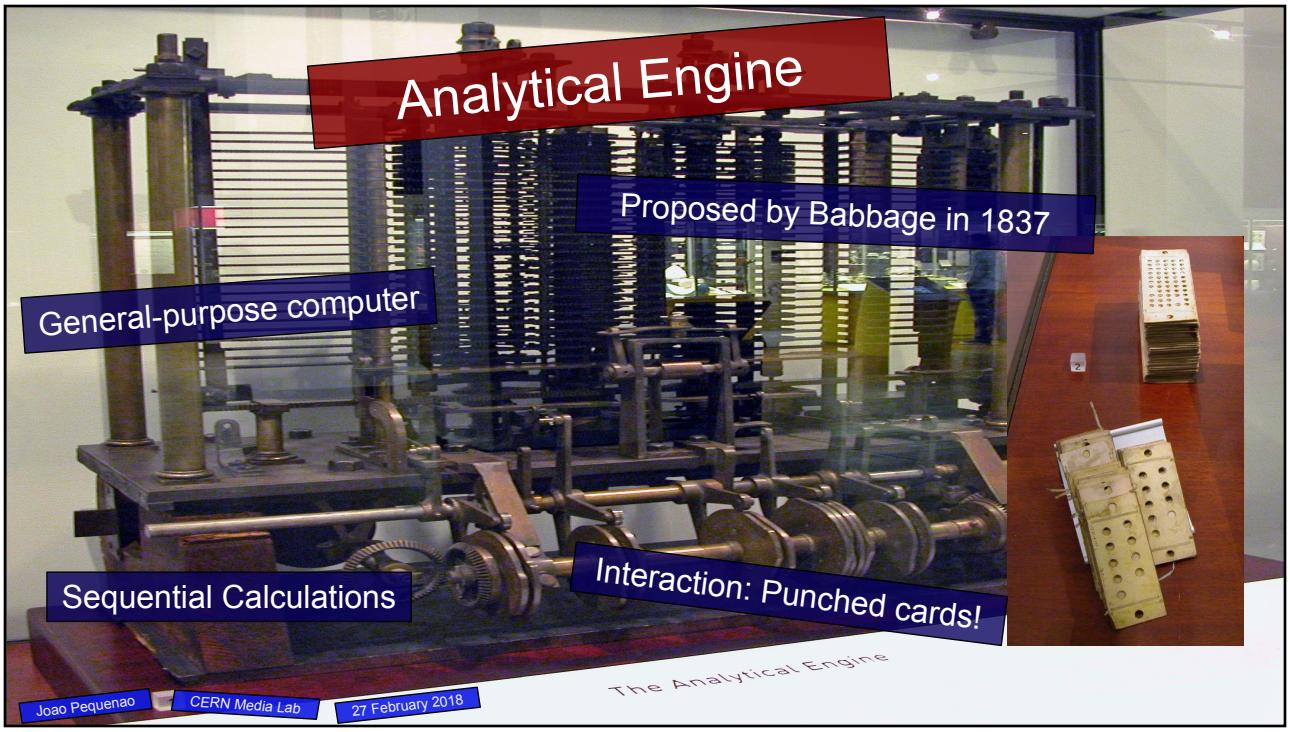
Analytical Engine
Proposed by Babbage in 1837
General-purpose computer
Sequential Calculations
Interaction: Punched cards!
The Analytical Engine
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IBM 029 (1964)

Interaction: Mechanical Keyboard/Punched cards!

First Mouse (1964)

Interaction: Hand movement in a 2D plane

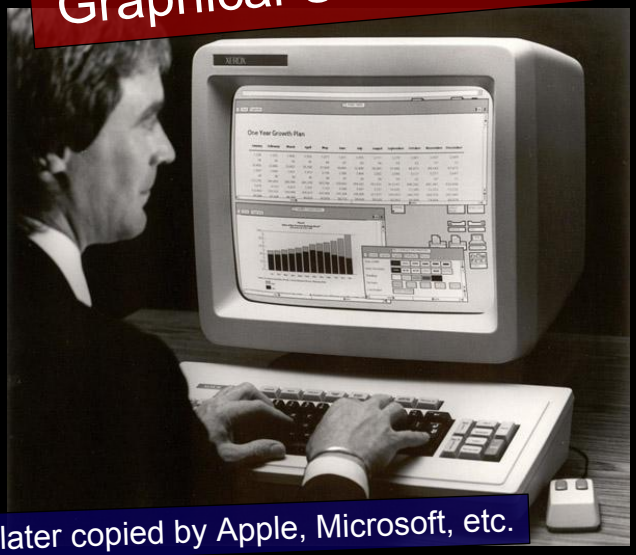
monday afternoon
december 9
3:45 p.m. / arena

Chairman:
DR. D. C. ENGELBART
Stanford Research Institute
Menlo Park, California

a research center for augmenting human intellect

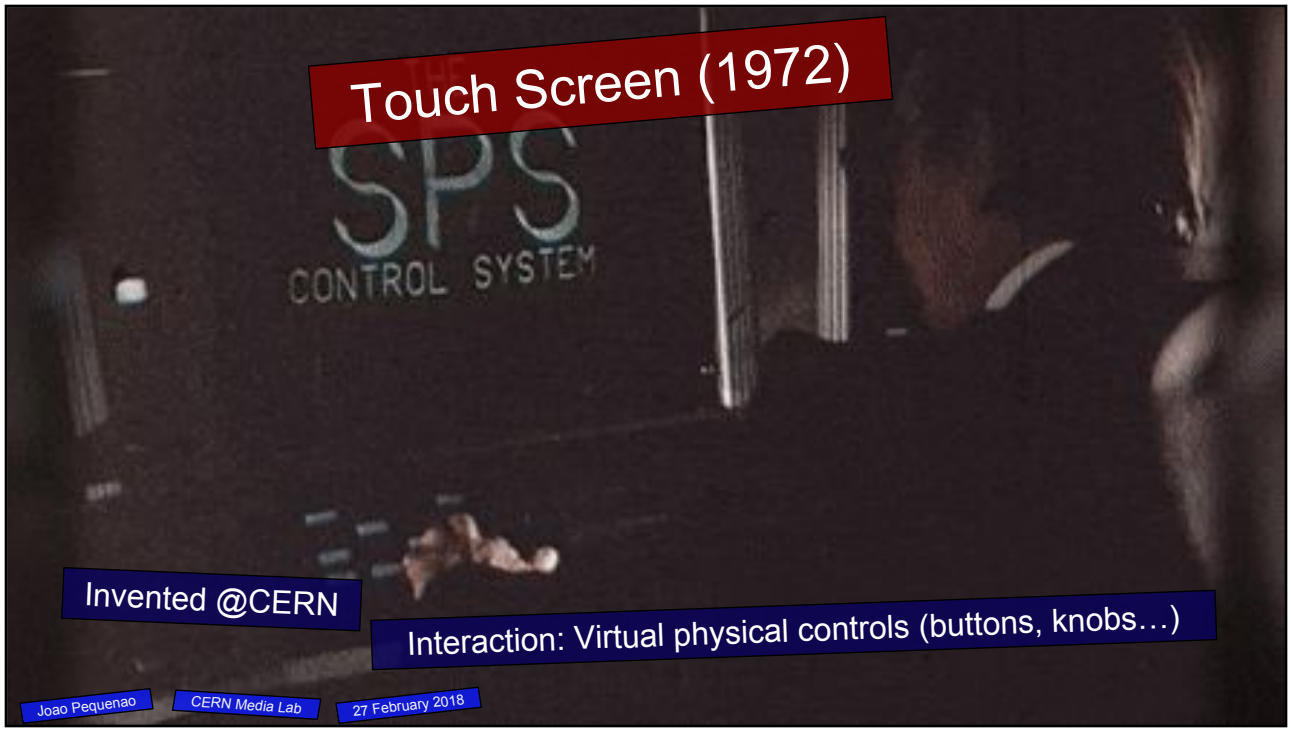
This session is entirely devoted to a presentation by Dr. Engelbart on a computer-based, interactive, multiconsole display system which is being developed at Stanford Research Institute under the sponsorship of ARPA, NASA and RADC. The system is being used as an experimental laboratory for investigating principles by which interactive computer aids can augment intellectual capability. The techniques which are being described will, themselves, be used to augment the presentation.
The session will use an on-line, closed circuit television hook-up to the SRI computing system in Menlo Park.
Following the presentation remote terminals to the system, in operation, may be viewed during the remainder of the conference in a special room set aside for that purpose.

Graphical User Interfaces



Xerox, 1970's. later copied by Apple, Microsoft, etc.

Touch Screen (1972)



Invented @CERN

Interaction: Virtual physical controls (buttons, knobs…)


And for over 30 years...
It was the era of the PC
Not much new in HMI
ABSOLUTELY
NOTHING
NEXT
22 MILES
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SciFi Visionaries
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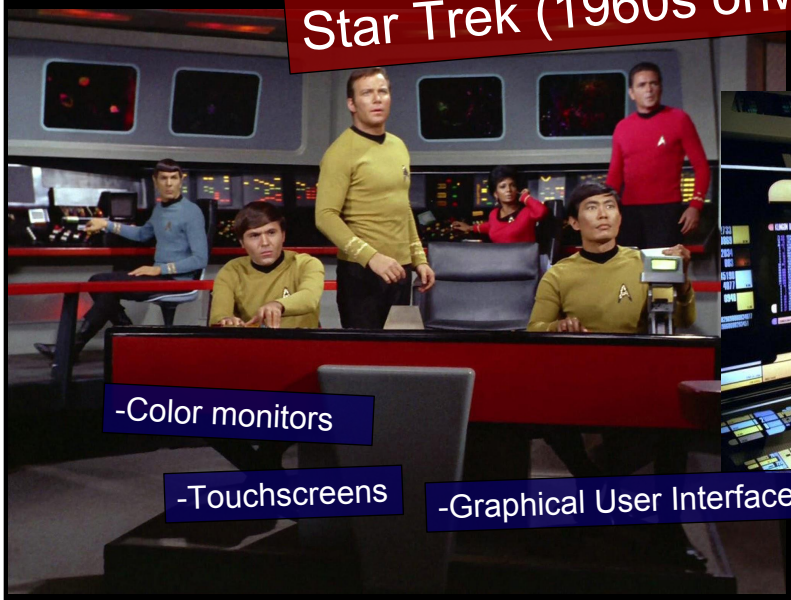
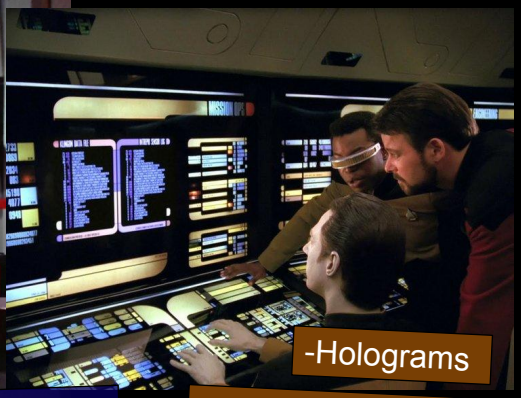
Star Trek (1960s onwards)



-Color monitors

-Touchscreens

-Graphical User Interfaces



-Holograms

-Augmented Reality

-Speech Recognition

2001: A Space Odissey (1968)

-Human-like verbal interaction

-Broad artificial intelligence

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New Technologies of the 21st Century

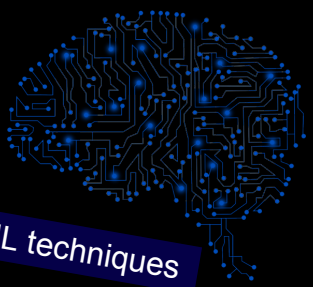
Cloud Computing (early 2000s)

2G 3G 4G

Mobile Internet

Smartphone (2007)

New, small sensors



New AI/ML techniques

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Minority Report (2002)

-Holographic Screens

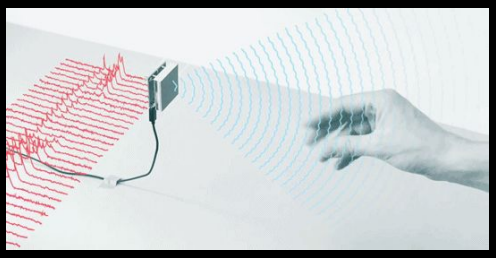
-Gesture Interfaces

-Personalized, Contextual Content

-Biometric Authentication

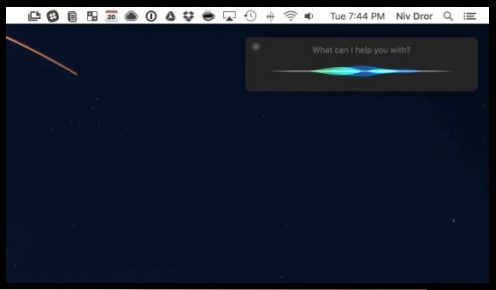
Complex Abstract Layers of Interaction

Distant Interaction

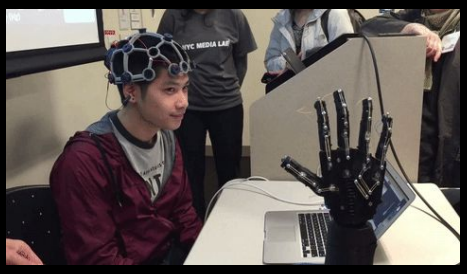


Natural Human Language

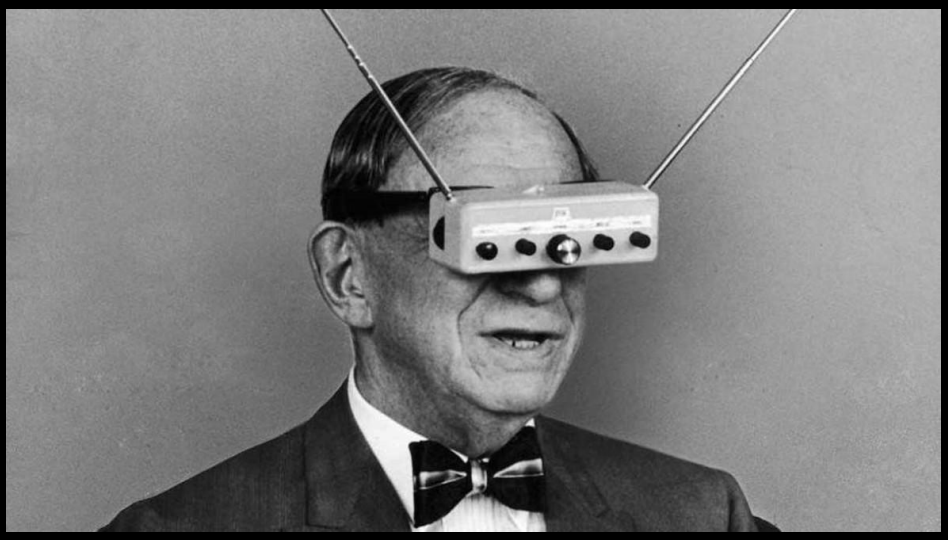
Hi, I'm Cortana



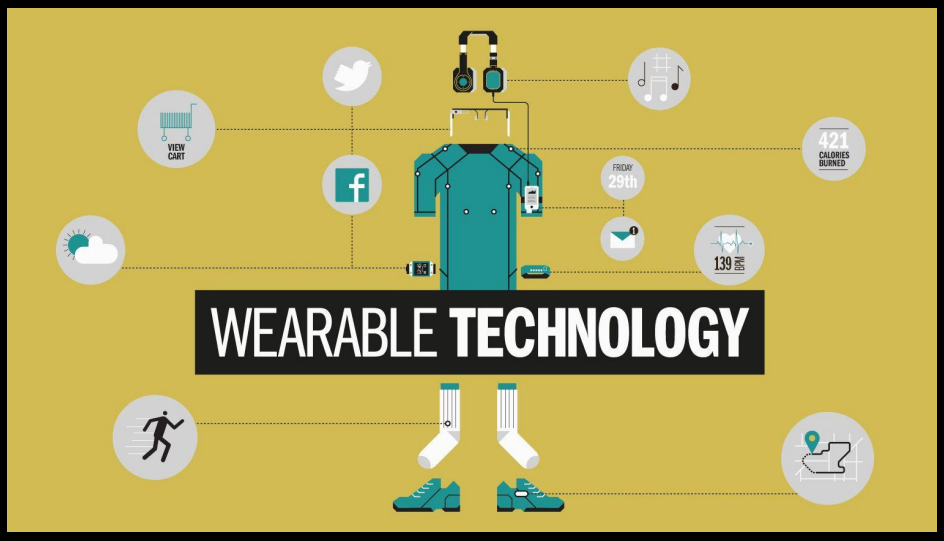
Brain-Machine Interfaces



Wearable Tech

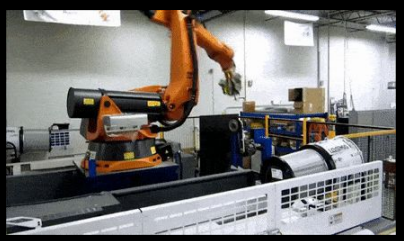


Wearable Tech



The Internet Of Things

Autonomous Machines



Emerging Adulthood