Interacción y Experiencia de Usuario

MAP OF COMPUTER SCIENCE

COMPUTATIONAL COMPLEXITY

DOES P≠NP?

EFFICIENT FOR A QUANTUM COMPUTER

EFFICIENT FOR A COMPUTER

NxN CHESS PSPACE NxNGO

NP COMPLETE

TRAVELLING SALESMAN MAP COLOURING

NP GRAPH ISOMORPHISM

BQP

DISCRETE LOGARITHM FACTORING

P

TESTING IF PRIME GRAPH CONNECTIVITY

INFORMATION THEORY

0100110100011001

COMPRESSION

ENTROPY

ERROR CORRECTION

CODING THEORY

PARITY CHECKING

CRYPTOGRAPHY

PUBLIC KEY

ALL THE SECRETS

PRIVATE KEY

HARDWARE

MONITOR

SOUND

SSD

GPU

RAM

POWER

INPUT

CPU

MOTHERBOARD

SCHEDULING

PROCESSES

SCHEDULER

CPU 1 CPU 2 CPU 3 CPU 4

MULTIPROCESSING

COMPUTER ARCHITECTURE

CPU

INPUT

CENTRAL PROCESSING UNIT

CONTROL UNIT

ARITHMETIC/ LOGIC UNIT

MEMORY UNIT

OUTPUT

GPU

MULTIPROCESSORS

FPGA

LOGIC BLOCK

INTERCONNECTION

INPUT/OUTPUT

SWITCH BOX

CONNECT BLOCK

THEORETICAL COMPUTER SCIENCE

COMPUTABILITY THEORY

TURING MACHINE

ALAN TURING

STATE REGISTER

INFINITELY LONG TAPE

HEAD

1: MOVE LEFT
2: MOVE RIGHT
3: FLIP DIGIT
123: STOP

LAMBDA CALCULUS

DATA STRUCTURES

LINKED LIST

LIST

TREE

GRAPH

STACK

HASHING

FORMAL METHODS

START

POSSIBLE STATES

ALERT

ALGORITHMS

BUBBLESORT(A)
1: GO FROM LEFT TO RIGHT.
2: COMPARE EACH PAIR.
3: IF LEFT ONE HIGHER, SWITCH.
4: DO UNTIL NO MORE SWITCHES.

BUBBLE SORT O(n²)

1 2 3 4 5 6 7 8

MERGE SORT O(n log n)

1 2 3 4 5 6 7 8

ANALYSIS OF ALGORITHMS

ALGORITHMIC COMPLEXITY

LOGIC

ZERO ONE NOT OR AND XOR NAND

COMPUTATIONAL GEOMETRY

GRAPH THEORY

AUTOMATA THEORY

QUANTUM COMPUTATION

AND MORE

PARALLEL PROGRAMMING

JOB 1 JOB 2 JOB 3 JOB 4

MAIN JOB

SMALLER JOBS

COMPUTER ENGINEERING

SOFTWARE AND PROGRAMMING LANGUAGES

PYTHON JAVASCRIPT PHP SWIFT PERL SQL JAVA C# C++ C ASSEMBLY

WEB APPS

BROWSER

APPLICATIONS

OPERATING SYSTEM

BIOS

SILICON

MACHINE CODE

JAVASCRIPT COMPILER

C++ COMPILER

C COMPILER

ASSEMBLY COMPILER

COMPILERS

DATA MANAGEMENT

DATABASES SQL DATACENTRES

NETWORKING

CONCURRENT/ DISTRIBUTED/ PARALLEL/ SYSTEMS

SOFTWARE ENGINEERING

FORMAL METHODS

UNIT TESTING

VERSION CONTROL

OBJECT ORIENTED DESIGN

OPERATING SYSTEMS

iOS

macOS

PERFORMANCE

COMPUTER ANALYSIS

BENCHMARKING

OPTIMISATION

FINANCE

LEAGUE OF LEGENDS

AMAZON WAREHOUSE

BOOLEAN SATISFIABILITY

x_1 OR x_2 OR $\bar{x}_3$ (SAT)

$\bar{x}_1$ OR $\bar{x}_2$ OR x_3

$\bar{x}_1$ OR x_2 OR $\bar{x}_3$

$\bar{x}_1$ OR x_2 OR x_3

SUPER COMPUTING

MACHINE LEARNING

SUPERVISED UNSUPERVISED

NEURAL NETWORK

CAT

REINFORCEMENT

COMPUTER GRAPHICS

COMPUTATIONAL SCIENCE

COMPUTATIONAL PHYSICS

NUMERICAL ANALYSIS

BIOINFORMATICS

COMPUTATIONAL CHEMISTRY

SIMULATION

HACKING

ARTIFICIAL INTELLIGENCE

A.I.

ROBOTICS

COMPUTER VISION

FIND THE HUMANS

APPLICATIONS

VIRTUAL REALITY

BIG DATA

NATURAL LANGUAGE PROCESSING

CHATBOTS

-HEY HELLO THERE-
-ARE U A ROBOT? YES-
-WAIT, I MEAN NO-
-PROVE IT! CALCULATING...-
-I MADE YOU CAKE-

SCONES TEA FLOUR BUTTER BIRTHDAY CAKE FOOD BACON CELEBRATION PANCAKE BREAKFAST

KNOWLEDGE REPRESENTATION

TELEPRESCENCE

AUGMENTED REALITY

YOUTUBE DOMAIN OF SCIENCE MAP OF COMPUTER SCIENCE

HUMAN COMPUTER INTERACTION

IMAGE PROCESSING

INTERNET OF THINGS

BY DOMINIC WALLIMAN ©2017

Datos de la asignatura

Aprender haciendo

01



Crear

AppInventor

Construir una aplicación móvil para resolver una necesidad propia.

→

02



Conversar

n8n

Conectar un agente conversacional con un flujo de trabajo.

→

03



Explorar

Unity

Crear experiencias de realidad virtual, aumentada o mixta.

→

04



Narrar

Twine

Diseñar una historia interactiva con decisiones y consecuencias.

→

05



Evaluar

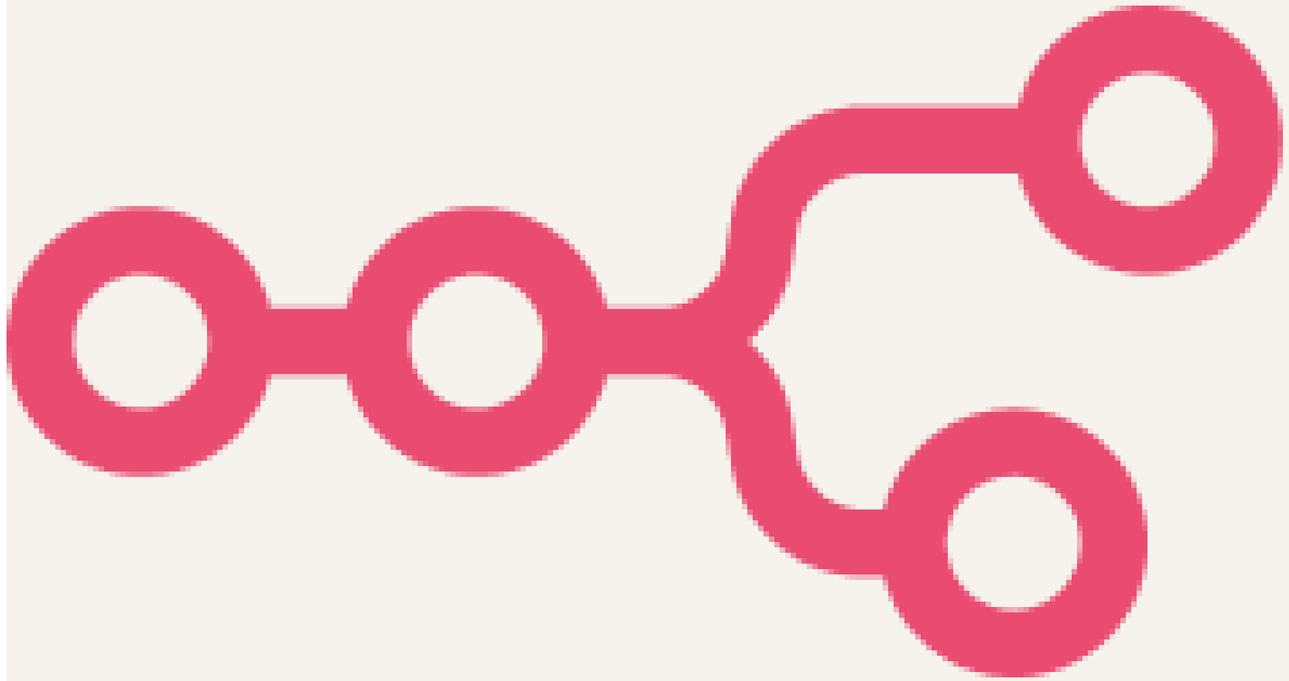
UX

Observar el uso y valorar la experiencia de las personas.



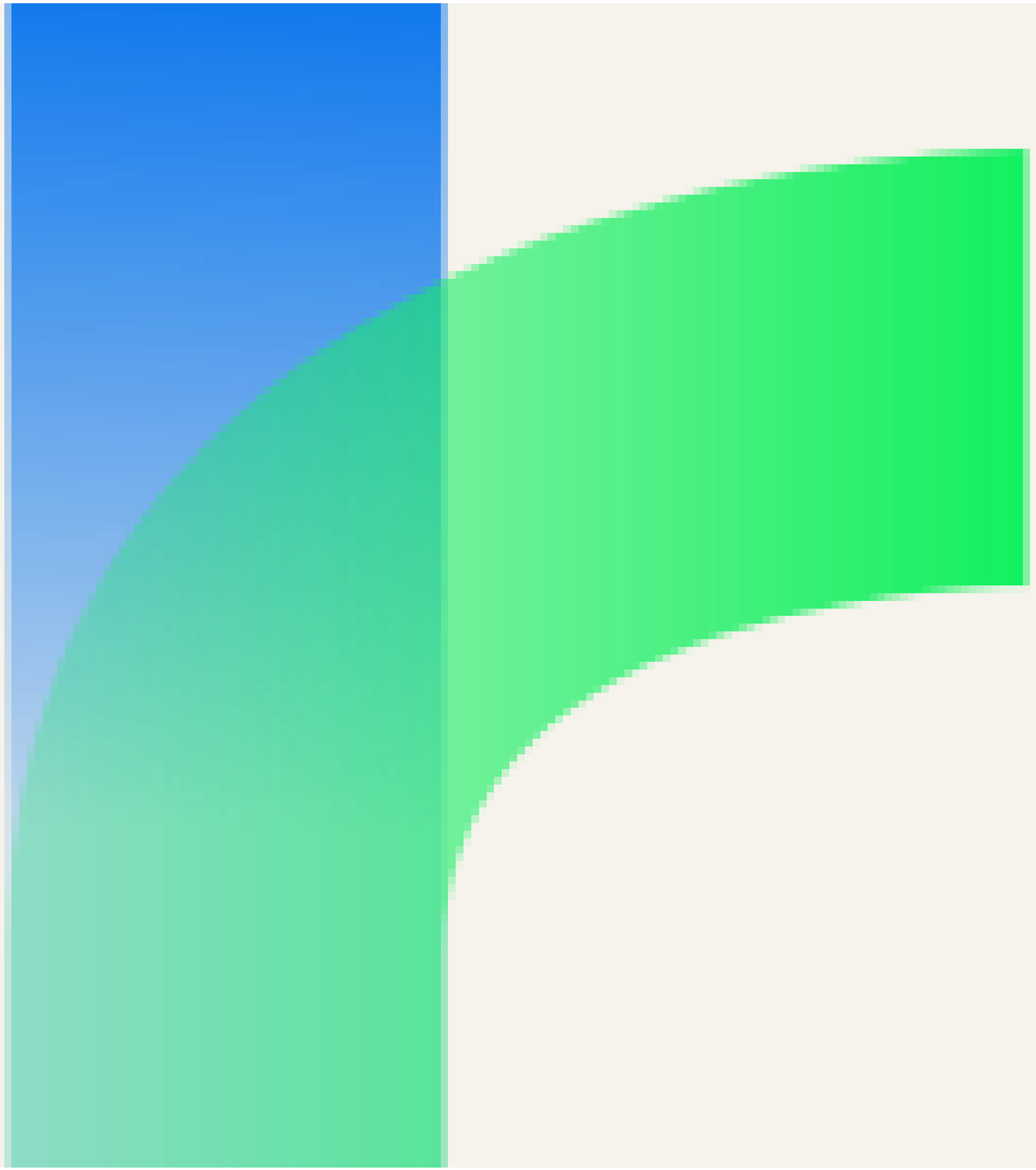
MIT

APP INVENTOR



n8n







Cinco bloques, el mismo peso

01



EUD

20 %

02



Interacción verbal

20 %

03



Entornos inmersivos

20 %

04



Videojuegos

20 %

05



UX

20 %

Un poco de historia

De los documentos a la conversación

01



1945

Memex

→

02



1963

Sketchpad

→

03



1973

Xerox Alto

→

04



1984

Macintosh

→

05



2007

iPhone

→

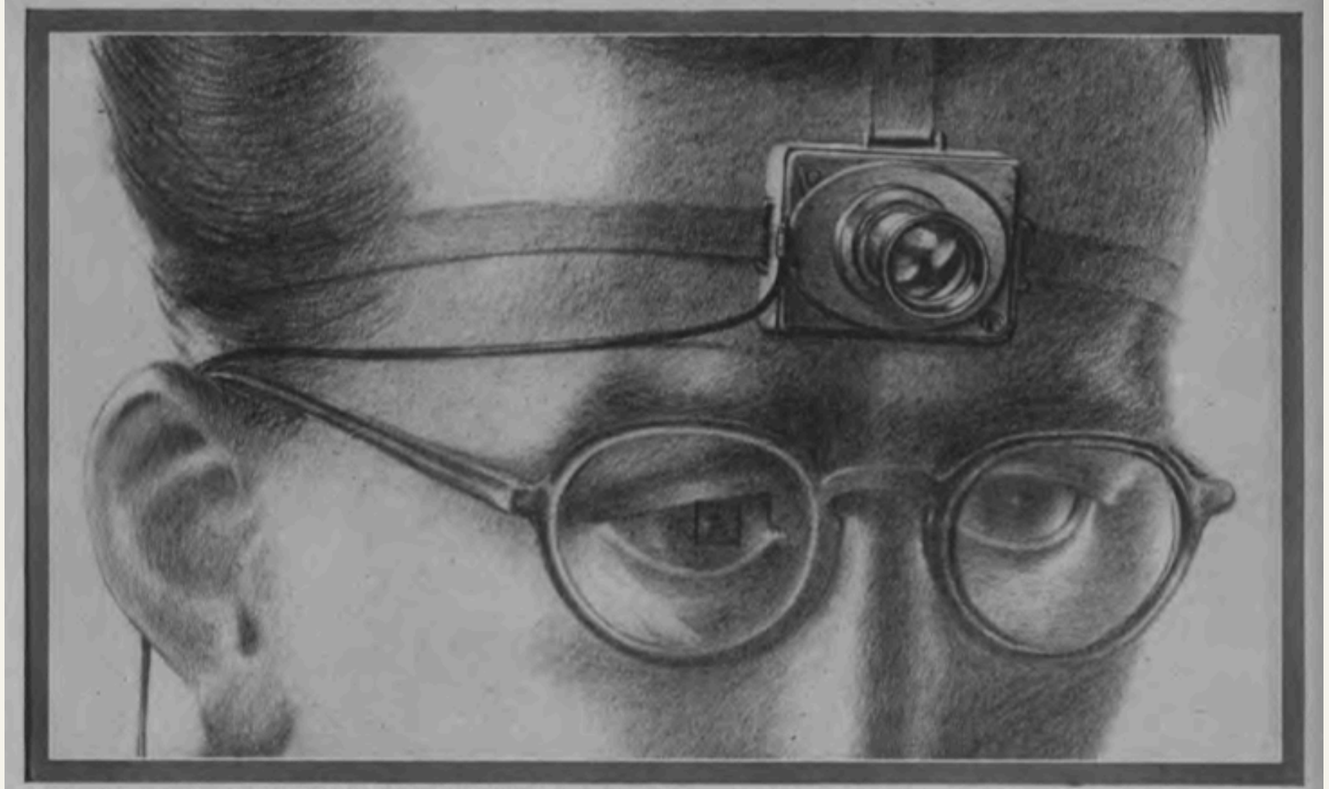
06



2022

ChatGPT

Vannevar Bush · Ivan Sutherland · Alan Kay · Steve Jobs · Steve Jobs (again) · Sam Altman



A SCIENTIST OF THE FUTURE RECORDS EXPERIMENTS WITH A TINY CAMERA FITTED WITH UNIVERSAL-FOCUS LENS. THE SMALL SQUARE IN THE EYEGLASS AT THE LEFT SIGHTS THE OBJECT

AS WE MAY THINK

A TOP U. S. SCIENTIST FORESEES A POSSIBLE FUTURE WORLD IN WHICH MAN-MADE MACHINES WILL START TO THINK

by VANNEVAR BUSH

DIRECTOR OF THE OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT

Condensed from the *Atlantic Monthly*, July 1945

This has not been a scientists' war; it has been a war in which all have had a part. The scientists, burying their old professional competition in the demand of a common cause, have shared greatly and learned much. It has been exhilarating to work in effective partnership. What are the scientists to do next?

For the biologists, and particularly for the medical scientists, there can be little indecision, for their war work has hardly required them to leave the old paths. Many indeed have been able to carry on their war research in their

ress, and the effort to bridge between disciplines is correspondingly superficial.

Professionally our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose. If the aggregate time spent in writing scholarly works and in reading them could be evaluated, the ratio between these amounts of time might well be startling. Those who conscientiously attempt to keep abreast of current thought, even in restricted fields, by close and continuous reading might

Ivan Sutherland · Sketchpad, 1962–1963 · MIT Museum / CHM 102652182

Volver




Diablo


Backspace
Tab
Caps Lock
Return
Shift
Shift
Option
Enter
Option

Volver





Memex: enlazar el conocimiento



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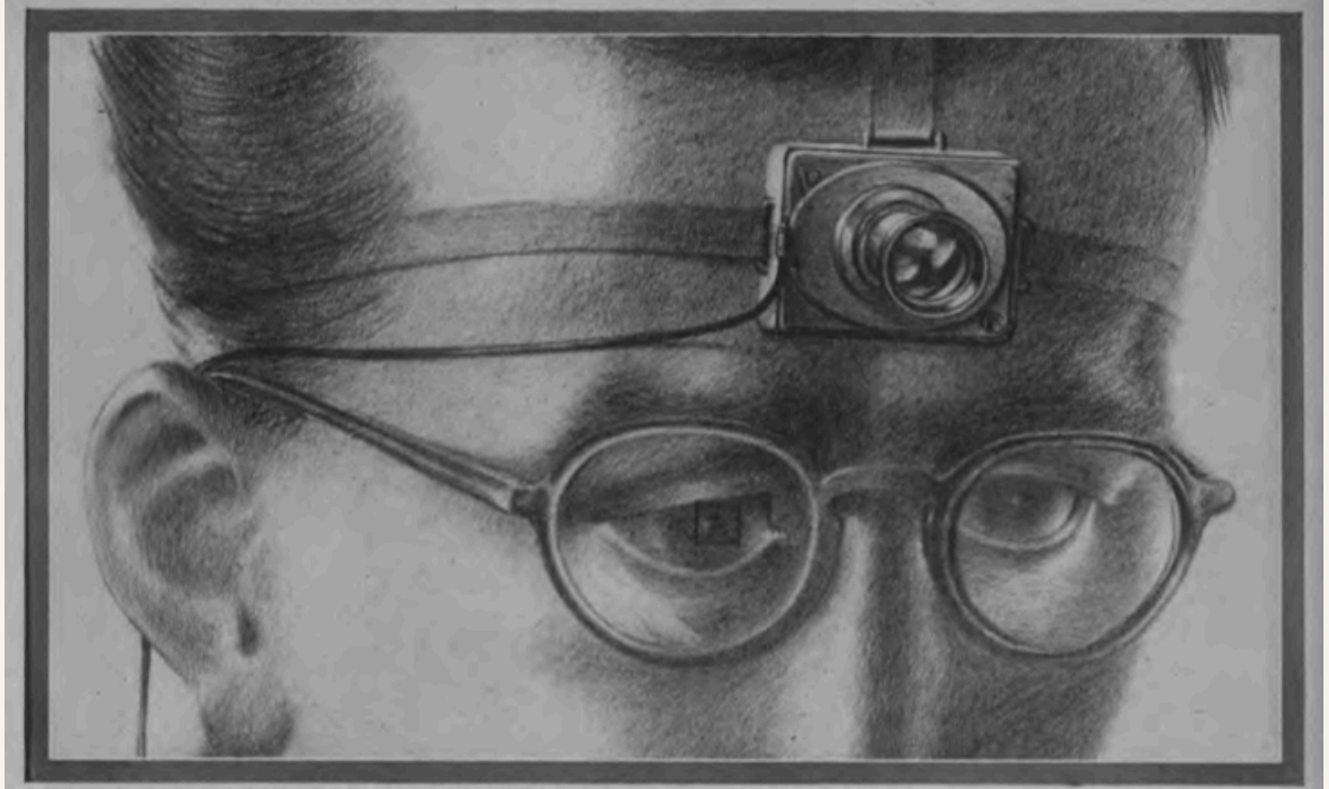
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Documentos → asociaciones → recuperación

Vannevar Bush



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Memex: Del archivo al recorrido de asociaciones



Memex animation - Vannevar Bush's diagrams made real

Mark Sanderson - researcher

Sketchpad: actuar sobre lo que se ve



Dibujar → modificar → ver el resultado

Ivan Sutherland

Volver



Iván Sutherland · Sketchpad, 1962–1963 · MIT Museum / CHM 102652182

Sketchpad: dibujar, imponer relaciones y modificar



Ivan Sutherland Sketchpad Demo 1963

Interface Studies

Xerox WIPM: Del laboratorio a la edición interactiva



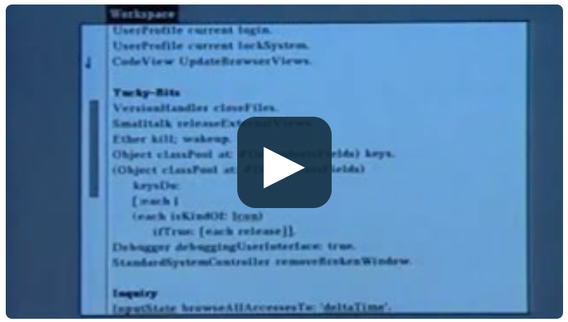
Xerox Alto Restoration Part 17 - Xerox Alto Demo

CuriousMarc



Yesterday's Computer of Tomorrow: The Xerox Alto | Bravo Demo

Computer History Museum



All the Widgets (Fixed v2) - 1990

Brad Myers

Visionado complementario · sin transcripción disponible

Macintosh WIMP: Innovación técnica y difusión de una interfaz



How Steve Jobs got the ideas of GUI from XEROX

Ringo Pebam



Xerox - The Company That Threw Away Everything

Logically Answered

Un poco de teoría

La interfaz conecta dos mundos

01



Persona

Percibe y decide

Parte de una intención y comprueba si consigue su objetivo.

→

02



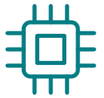
Interfaz

Representa y responde

Hace visibles las acciones posibles y el estado del sistema.

→

03



Ordenador

Ejecuta funciones

Transforma las entradas en resultados mediante operaciones.

Timesharing: Tiempo compartido y continuidad de la interacción



1963 Timesharing: A Solution to Computer Bottlenecks

Computer History Museum

Teorías de la interacción

Teoría de la actividad

Actividades y tareas del usuario

Modelos conceptuales

Representación mental del sistema

Procesos de diseño

Decisiones y revisión del diseño

Búsqueda de información

Encontrar y relacionar información

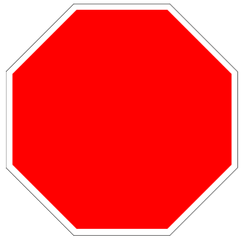
Semiótica

Interpretación de signos

Comunicación

Intercambio de mensajes y significado

¿Qué implica este significante?



Affordance y feedback

01



Pista visual

¿Qué puedo hacer?

La forma del objeto sugiere cómo interactuar con él.

→

02



Acción

Lo intento

El usuario prueba una operación sobre la representación.

→

03



Respuesta

¿Qué ha ocurrido?

El sistema permite reconocer el efecto de la acción.

¿Cuáles de las siguientes interfaces proporcionan representaciones *aprendibles*?



Ratón



Pantalla táctil



Interfaz de voz



Dispositivo de VR

Aprendibilidad: descubrir cómo actuar

01



Ratón

Acción indirecta

El movimiento de la mano controla un puntero en pantalla.

02



Pantalla táctil

Acción sobre el objeto

El gesto se realiza directamente sobre la representación.

03



Voz

Expresar una intención

La petición requiere interpretar palabras y contexto.

04



Realidad virtual

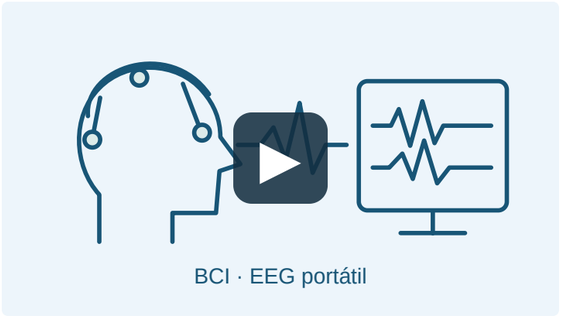
Actuar en un espacio inmersivo

La mirada, los gestos y los mandos permiten explorar y actuar en el entorno.

¿Todas las UI proporcionan un comportamiento funcional determinista?

Emotiv brain—computer interface (BCI) with portable EEG

Observa la demostración para debatir cómo se relacionan las señales EEG, su interpretación y la respuesta de la interfaz.



Emotiv brain—computer interface (BCI) with portable EEG

Una interfaz, muchas disciplinas



- Informática
- Diseño
- Lingüística
- Psicología
- Ergonomía
- Sociología

HCI: Situar la interacción persona-ordenador en el mapa de la informática



Map of Computer Science

Domain of Science

- Map of Computer Science: IPO y entornos inmersivos, desde 8:55

Disciplinas involucradas

Pregunta para el aula

¿Qué interfaz resulta más fácil de aprender?

Elegid una tarea y comparad ratón, tacto y voz.

Temario detallado

Temario detallado

01



EUD y bloques

Crear herramientas

→

02



Interacción verbal

Conversar y combinar modalidades

→

03



Entornos inmersivos

Explorar realidad virtual, aumentada y mixta

→

04



Videojuegos

Diseñar y aprender jugando

→

05



UX

Evaluar la experiencia