

# CS449/649: Human-Computer Interaction

Winter 2018

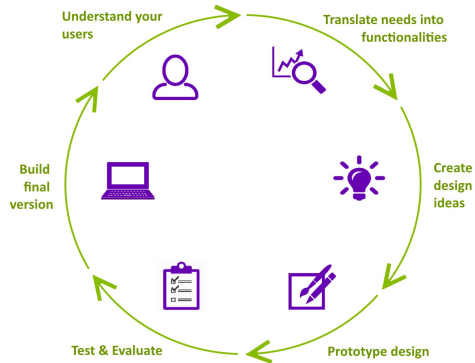
Lecture XVI

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Anastasia Kuzminykh

## User Centered Design Process

January 4 - March 1



## History of user centered design in HCI

March 6, March 8



## Academic HCI

March 13, March 15



## Special topics in HCI

March 20, March 22



## Course Review

March 27



## Presentation 2

March 29



## Last class

April 3





## History

### Stages in the development of a technology (by David Liddle)

**Enthusiast stage**



<http://www.candstech.com>

**Professional stage**



<https://www.falmouth.ac.uk/>

**Consumer stage**



<https://www.slashgear.com/>



## History

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**Concept of Digital Natives and Digital Immigrants**, Marc Prensky, 2001



## History

Waterfall Model

GUI and WIMP

Agile Development

User Centered Design in Computer Systems

HFE and Ergonomics

Socio-Technical Systems Design

Cognitive Psychology

Cooperative Design

Interaction Design



## History

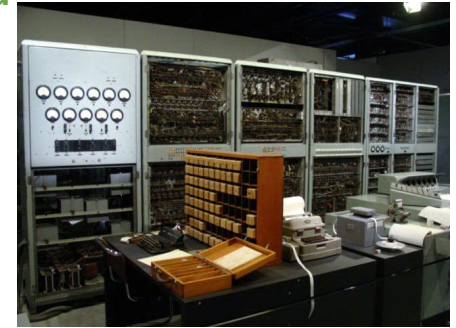
1880-90s - Frederick Taylor - "scientific management" method

Goals of occupational health and safety and Productivity

Maximizing the safety and healthiness of work environments and work practices

Gained popularity in 1940s

Concept of ergonomic fit:  
“fitting the man to the job and the job to the man”  
(Alec Rodger)



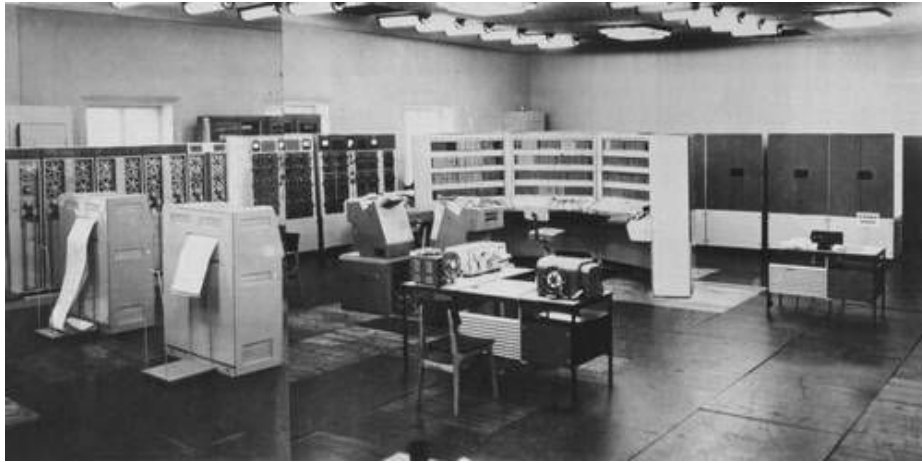
<http://www.computerhistory.org/timeline/1951/>

HFE and Ergonomics

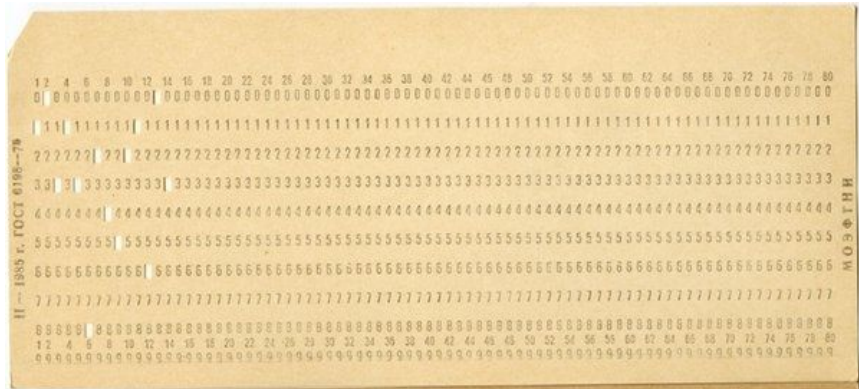




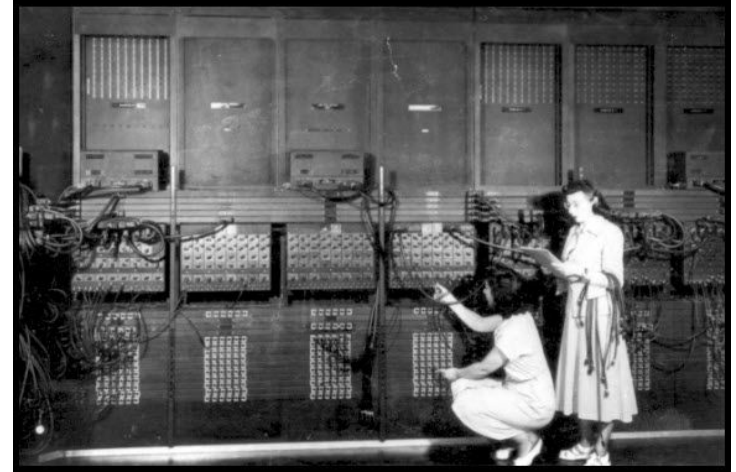
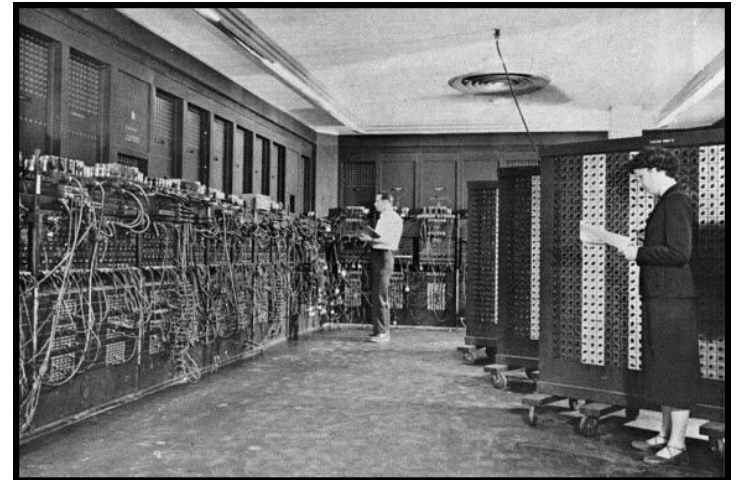
1944 – Boeing B29 Super Fortress – Last WWII U.S. heavy bomber.  
Image: <https://firstaerosquadron.com/2015/09/23/cockpit-evolution-from-the-beginning-to-present/>



BESM



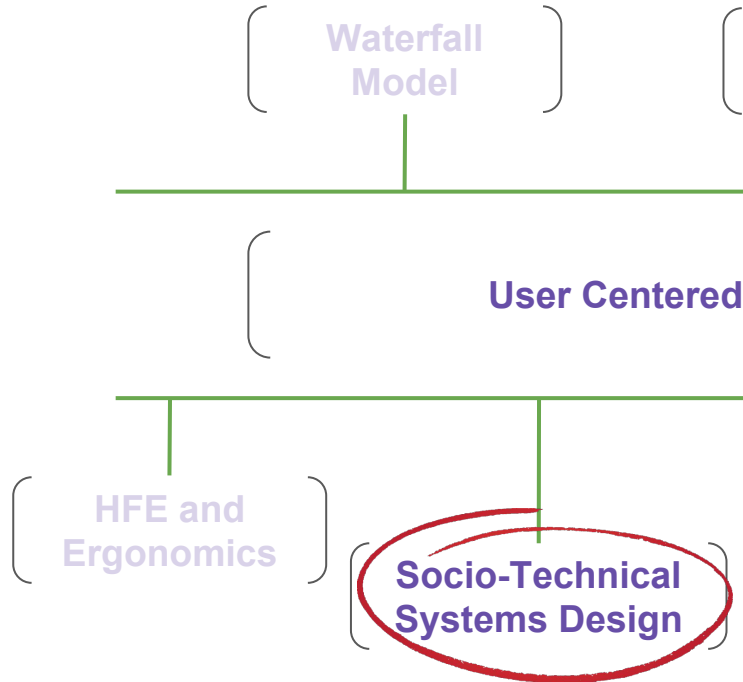
Punch Card



ENIAC, 1946



## History



Term was coined by **Fred Emery and Eric Trist** (1950s)

Describes systems that involve a complex interaction between **humans, machines, and the environmental aspects of the work system**

### STSD guiding principles:

- **Meaningfulness of tasks**
- **Whole task and minimal critical specification**
- **Responsible autonomy**
- **Adaptability**

## VAX 11/780 Computer – CPU



“Digital Equipment Corporation (DEC) had a family of expert systems that were developed using STSD to support the configuration and location of DEC VAX computers”

From Ritter, Gordon, Churchill. "User-centered systems design: a brief history."

## Cognitive modeling - approximation of human reasoning

Developed as a method in late 50s - early 60s

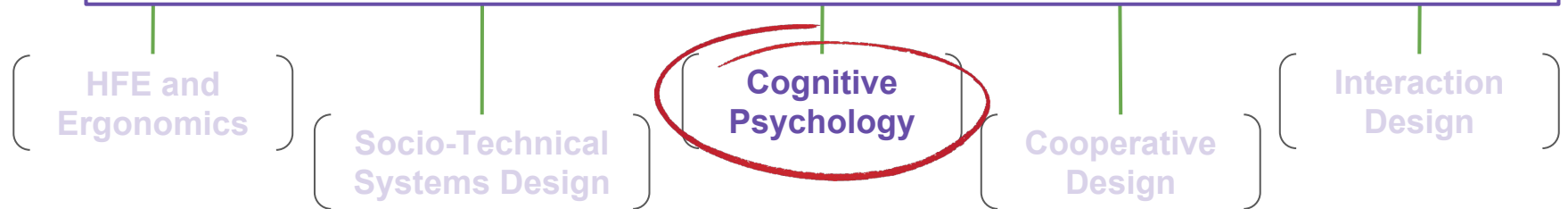
Computational process as a metaphor for human reasoning:

- Input
- Memory and storage
- Information manipulation
- Output

Early models focused on separate stages, then

Unified theories of cognition by Allen Newell, 1990

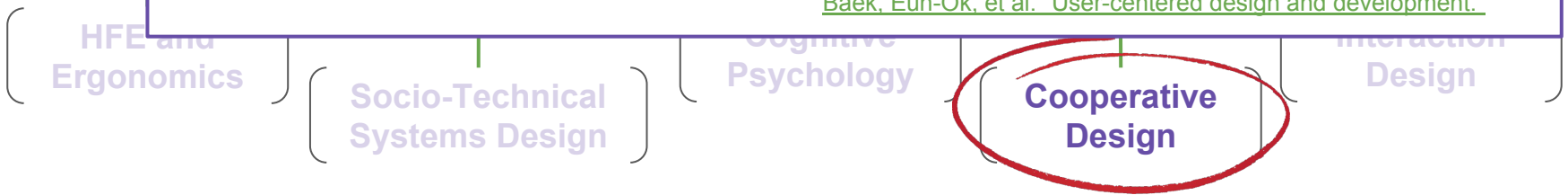
How people reason and problem solve when using complex interfaces?



Originated in Scandinavia in 1970s from an action research approach  
In North America, referred to as participatory design / co-design approach  
Focused on process, not style

Degrees of participation:	Weak participation	Strong Participation
Interaction	Indirect	Direct
Length	Short	Long
Scope	Small	Large
Control	Very limited	Very broad

[Baek, Eun-Ok, et al. "User-centered design and development."](#)



Term was coined by Bill Moggridge and Bill Verplank, mid-1980s

The design of the interaction between users and products

First design programs:

- the Visible Language Workshop, Muriel Cooper, MIT, 1975
- the Interactive Telecommunications Program, Martin Elton, NYU, 1979

The first academic program:

- Master of Design in Interaction Design, Carnegie Mellon University, 1994

