

# CS449/649: Human-Computer Interaction

Spring 2017

Lecture XV

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Anastasia Kuzminykh

**Poster - advertisement to your work,  
keep it visual**

**Information**

**All important points**

**~300-400 words**

**Should be an  
illustrated story**

**Text**

**Headings should be  
readable from about  
10 feet away**

**Clear text in short  
sentences**

**2-3 different font  
sizes + 1 for title**

**Organisation**

**Bullets, numbering,  
headlines**

**Graphics, color,  
contrasts, fonts**

**Consistent and  
leading layout**

**Free space**

**Images**

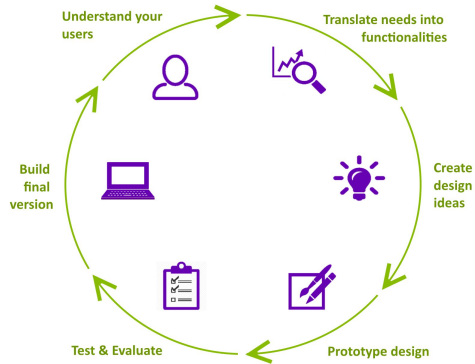
**Always  
include captions**

**Large and clear**

**To the point**

## User Centered Design Process

May 1 - June 14



## History of user centered design in HCI

June 19, June 21



## Academic HCI

June 26, June 28



## Special topics in HCI

July 5, July 10



## Course Review

July 12, July 17



## Presentation 2

July 19

## Last class

July 24



## History

“The need for the future is not so much computer oriented people  
as for people oriented computers” (Nickerson, 1969)



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User Centered Design - Donald A.Norman, UC San Diego, "User-Centered System Design: New Perspectives on Human-Computer Interaction", 1986



## 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

“The need for the future is not so much computer oriented people as for people oriented computers” (Nickerson, 1969)

User Centered Design - Donald A.Norman, UC San Diego, "User-Centered System Design: New Perspectives on Human-Computer Interaction", 1986

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

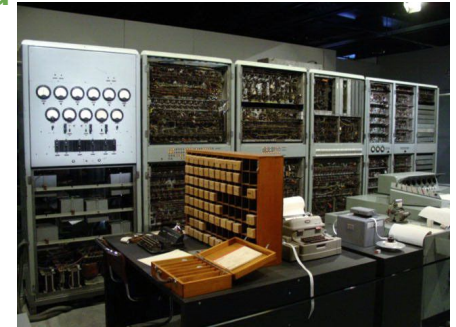
1880-90s - Frederick Taylor - "scientific management" method

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)



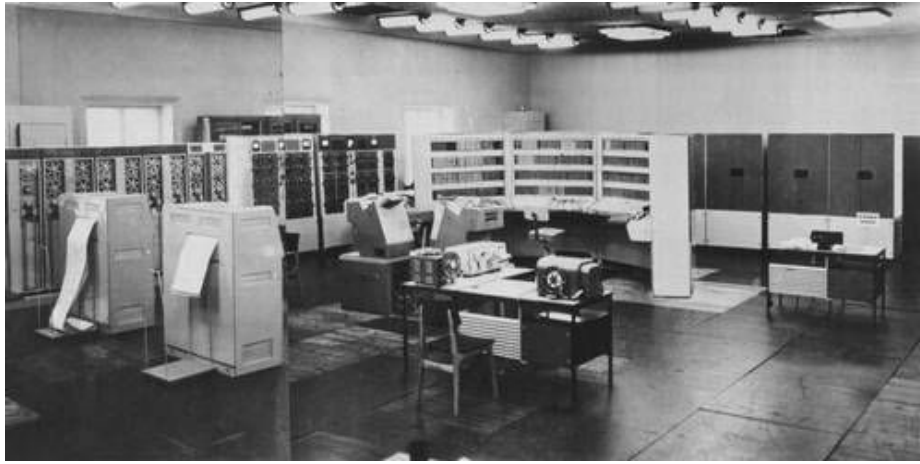
<http://www.computerhistory.org/timeline/1951/>

HFE and Ergonomics

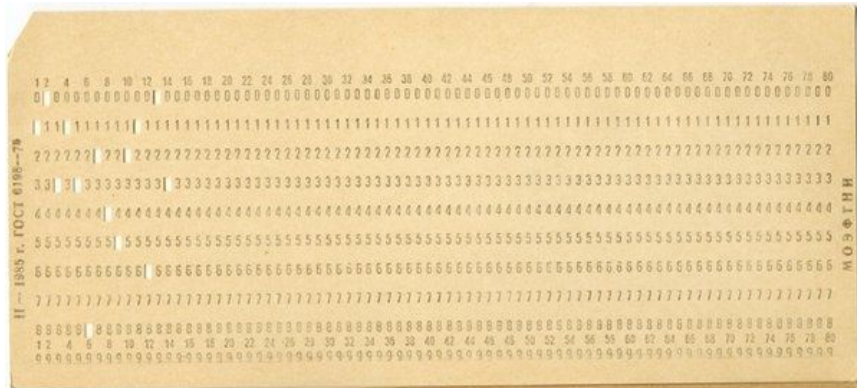


**1944 – Boeing B29 Super Fortress – Last WWII U.S. heavy bomber.**

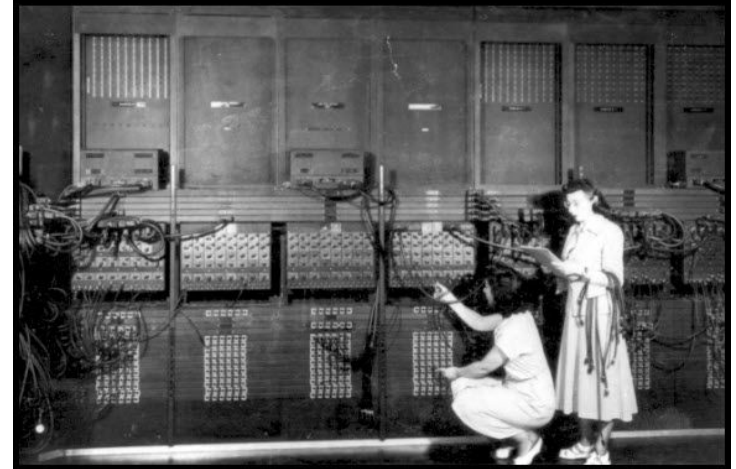
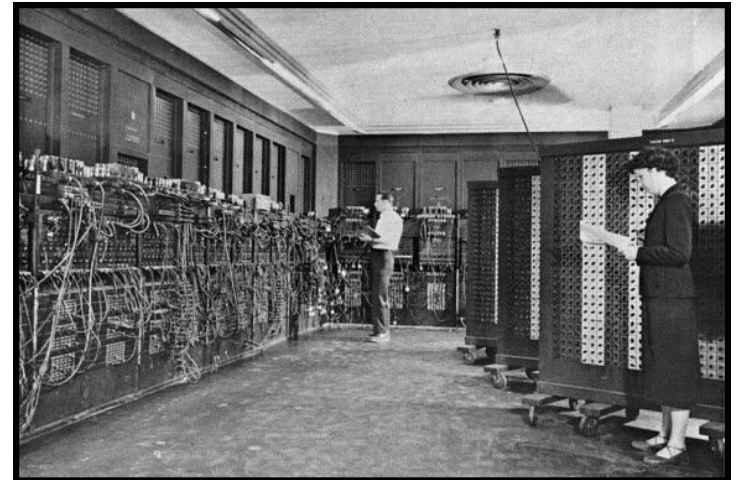
**Image:** <https://firstaerosquadron.com/2015/09/23/cockpit-evolution-from-the-beginning-to-present/>



**BESM**



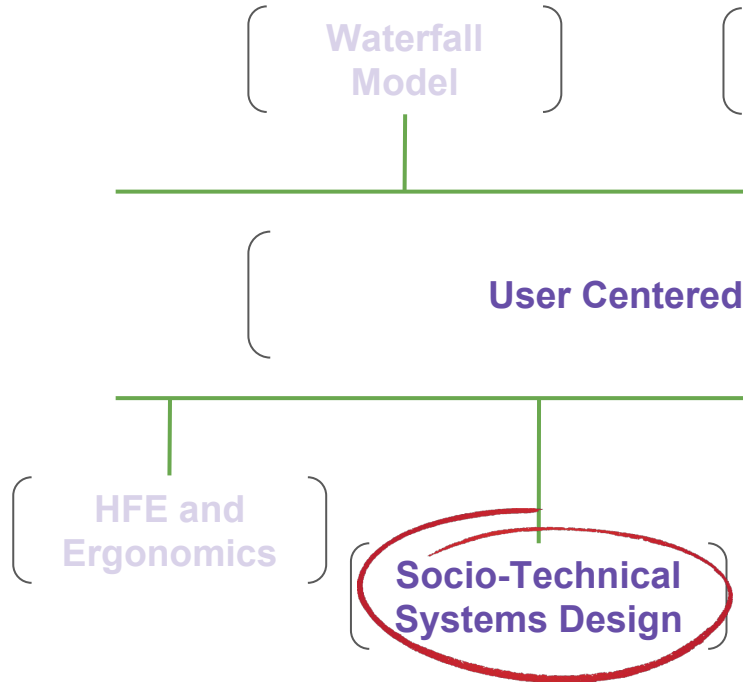
## Punch Card



## 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

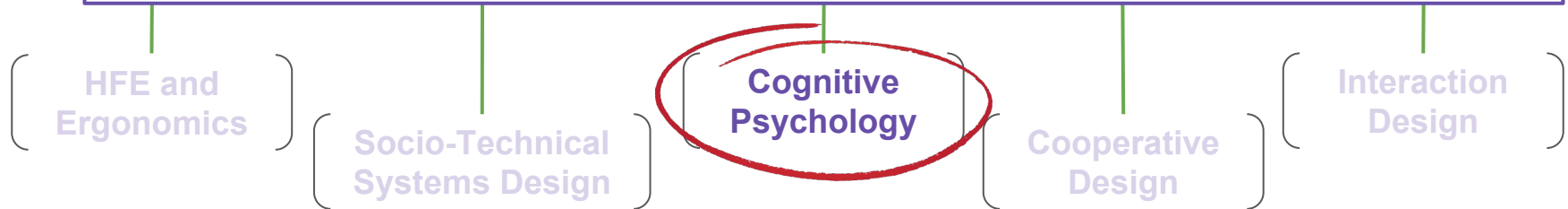
Computational process as a metaphor for human reasoning:

- 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."

HFE and  
Ergonomics

Socio-Technical  
Systems Design

Cognitive  
Psychology

Cooperative  
Design

Interaction  
Design

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

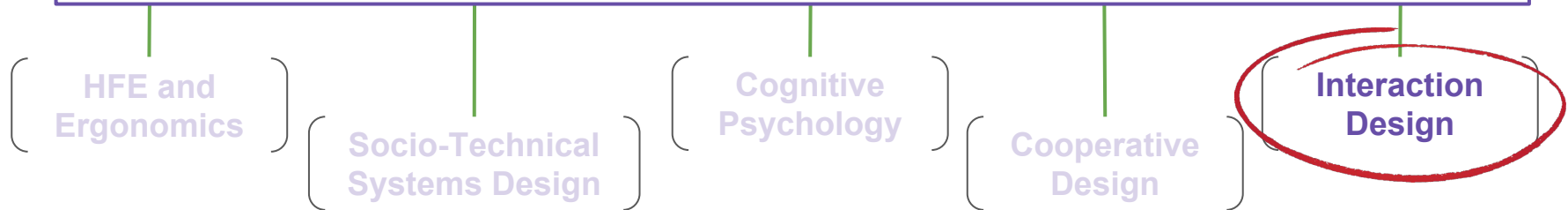
The design of the interaction between users and products

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







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