

NPTEL Course on

# Human Computer Interaction - An Introduction

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# Module 1: Introduction to HCI

## Lecture 2: A Brief History

**Dr. Samit Bhattacharya**

# How HCI Evolved

- From the early computers which performed batch processing, we now have come to the user-centered design, the hallmark of HCI
- There were several milestones along the way, which are mentioned with brief discussion in the subsequent slides

# Evolution of HCI:

## Major Milestones

- Early computer (e.g. ENIAC, 1946)
  - Improvement in H/W technology (vacuum tube → transistor → IC) implied massive increase in computing power
  - People started to think about “how to use this power by equivalent explosion of ideas”, which leads to the idea of human centered computing (J. C. R. Licklider)

# **Evolution of HCI:**

## **Major Milestones**

- By mid 1950's, researchers realized the need for VDU
  - Earliest application that used VDU was SAGE (semi automatic ground environment) – an air defense system of the USA air force

# **Evolution of HCI: Major Milestones**

- The development of the Sketchpad by Ivan Sutherland (1962)
  - People started to realize that computer can be used for more than data processing (computer can be made to use more human language rather than the opposite)

# Evolution of HCI:

## Major Milestones

- Douglas Engelbart, in his article “ A conceptual framework for augmentation of man’s intellect” (1963), introduced the idea of programming toolkits
  - “toolkit” concept: larger systems can be created from composition of small, well understood components

# Evolution of HCI: Major Milestones

- Their group Augmentation Research Center at the SRI was responsible for many of the interaction techniques and devices that we now-a-days take for granted
  - Introduced concept of word processor, mouse
  - Designed NLS (oNLine System) - 1968



# Evolution of HCI: Major Milestones

- The idea of personal computer
  - Allan Kay (1970's) thought of Dynabook – influenced by Engelbart as well as Seymour Papert's LOGO
  - Developed “smalltalk” (a visually based programming environment) at Xerox PARC

# Evolution of HCI: Major Milestones

- Windows and WIMP interfaces
  - Humans are able to think about more than one thing at a time
    - In accomplishing some tasks, they frequently interrupt their current train of thought and switch to some other piece of work

# Evolution of HCI: Major Milestones

- Windows and WIMP interfaces
  - Sequential interaction to complete task is not suitable for this behavior
  - WINDOW system and WIMP interaction developed to take care of this
    - 8010 star information system – Xerox, 1981
    - Many common ideas with NLS and Xerox PARC alto

# Evolution of HCI: Major Milestones

- The idea of *metaphor* (i.e., representing abstract actions/objects in terms of known artifacts)
  - Xerox star and alto were the first systems to use the concept of metaphors
  - Use of metaphor increases *affordance* which leads to *naturalness* of the interface

# Evolution of HCI: Major Milestones

- Direct Manipulation
  - Ben Shneiderman coined the term in 1982
  - First successful use of the idea in Apple Mac PC (1984)
  - Common GUI operations (move, drag etc)
    - Reduces the chances for syntactic errors, learning for command line interfaces
  - WYSIWYG (What You See Is What You Get)

# Evolution of HCI:

## Major Milestones

- Hypertext
  - The idea was first articulated by Vannevar Bush (1945) in "As we may think"
    - The Memex system
  - Ted Nelson coined the term hypertext (mid 1960's) to denote the non-linear structure of text (in the context of reading)
    - Related terms: hypermedia (1980's)/multimedia

# **Evolution of HCI: Major Milestones**

- Multimodality (late 1980's)
  - Relies on multiple human communication channel simultaneously for input and output

# **Evolution of HCI: Major Milestones**

- Computer supported cooperative work (CSCW)-1990's
  - Computer networks in 1960's
  - Society/sociology comes into picture
  - Groupware (CSCW systems built to support users working in a group)
  - Computer mediated communication



# Evolution of HCI: Major Milestones

- WWW
  - Tim Berners – Lee (CERN, 1989) was the inventor of the most popular application layer protocol (which we used synonymously with networks)
  - The year 1991 saw the first text based browser
  - The first graphical browser (Mosaic) came in 1993

# Evolution of HCI:

## Major Milestones

- Ubiquitous computing – the most active research area in HCI now
  - The field originated from Mark Weiser's vision, Xerox PARC, late 1980's
  - Sensor based/context aware computing (1990's)
  - Also known as pervasive computing