



# The Importance of the User Interface

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The Essential Guide to UI Design:  
Chapter 1

# What is UI?

- UI design is a subset of HCI
- Part of a computer & its software that people can see, hear, understand, etc.
- Two components: input & output
- IO devices?





# Is Good Design Important?

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- UI is the most important part of any computer system!
- Over 50% of code devoted to UI
- Users' productivity improved 25 to 40%.
- A company saved \$20 000 !



# What comprises good design?

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- **PEOPLE:**

- How we see, understand, and think

- **INFORMATION:**

- Enhance human acceptance
- Ease eye & hand movements

- **HARDWARE & SOFTWARE:**

- Capabilities & limitations of HCI



# The Goals of UI Design

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- To make working with a computer
  - EASY
  - PRODUCTIVE
  - ENJOYABLE



# Examples

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- Interface screen of Text Properties
- Text Editor
- Class registration form (lab #1)

## Text Properties

Family  times  helvetica  courier  sans serif

Size  small  medium  large

Style  underline  bold  italic

Pitch  10 CPI  12 CPI  15 CPI  proportional

Color  black  blue  red  green

Border        

OK

Apply

Cancel

Help

## TEXT PROPERTIES





### Family

- Courier
- Helvetica
- Sans Serif
- Times

### Pitch

- 10 CPI
- 12 CPI
- 15 CPI
- Proportional

### Border

- 
- 
- 
- 

### Size

- Small
- Medium
- Large

### Style

- Bold
- Italic
- Underline

### Color

- Black
- Blue
- Green
- Red

OK

Apply

Cancel

Help



## PIF Editor

Program Filename:

Window Title:

Optional Parameters:

Start-up Directory:

Video Memory:

Text

Low Graphics

High Graphics

Memory Requirements: KB Required

KB Desired

EMS Memory:

KB Required

KB Limit

XMS Memory:

KB Required

KB Limit

Display Usage:

Full Screen

Execution:

Background

Windowed

Exclusive

Close Window on Exit

# PIF EDITOR

## APPLICATION

Program Filename:

Window Title:

Optional Parameters:

Start-up Directory:

## MEMORY

REAL >

Required:

KB

Desired:

KB

EMS >

Required:

KB

Limit:

KB

XMS >

Required:

KB

Limit:

KB

VIDEO >

Type:

Text

Low Graphics

High Graphics

## Display Usage

Full Screen

Windowed

## Execution

Background

Exclusive

## Window

Close on Exit



# 14 steps

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- 1) Know Your User
- 2) Understand the Business Function
- 3) Understand the Principles of Good ID
- 4) Develop System Menus
- 5) Select the Proper Kinds of Windows
- 6) Select the Proper Interaction Devices
- 7) Choose the Proper Screen-Based Controls



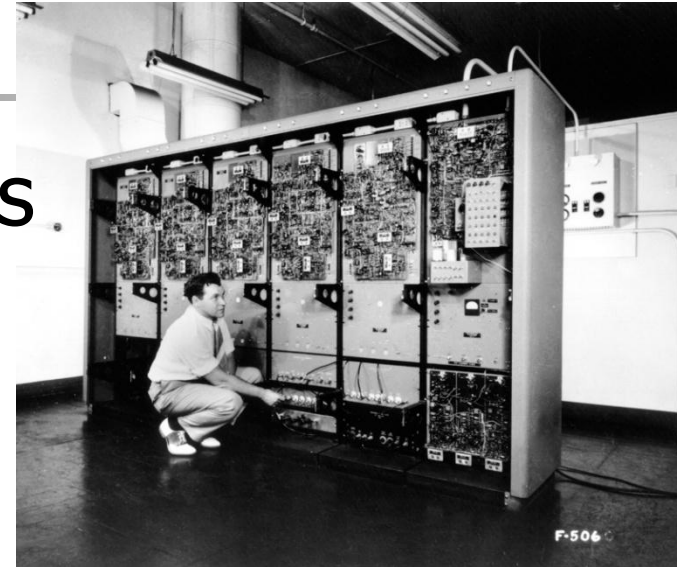
## 14 steps (cont.)

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- 8) Write Clear Text
- 9) Provide Effective Feedback
- 10) Provide Effective Accessibility
- 11) Create Meaningful Graphics
- 12) Choose the Proper Colors
- 13) Organize Windows
- 14) Test

# History of HCI

- 1) Movements & gestures
- 2) Spoken language
- 3) Written language
- 4) Typewriter
- 5) Computers: QA, Menu selection, Form fill-in (Speech & handwriting recognition)
- 6) Introduction of GUI





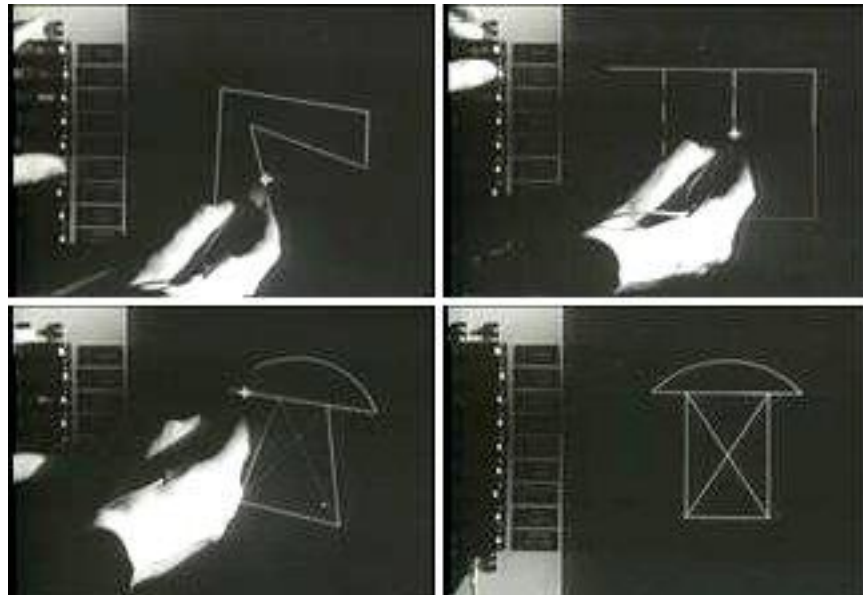
# What is GUI?

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- Pronounced “gooey”
- A **graphical user interface (GUI)** is a type of user interface) is a type of user interface which allows people to interact with electronic devices such as computers; hand-held devices such as MP3 Players, Portable Media Players or Gaming devices; household appliances and office equipment with images rather than text commands. (Wikipedia)

# History of HCI (cont)

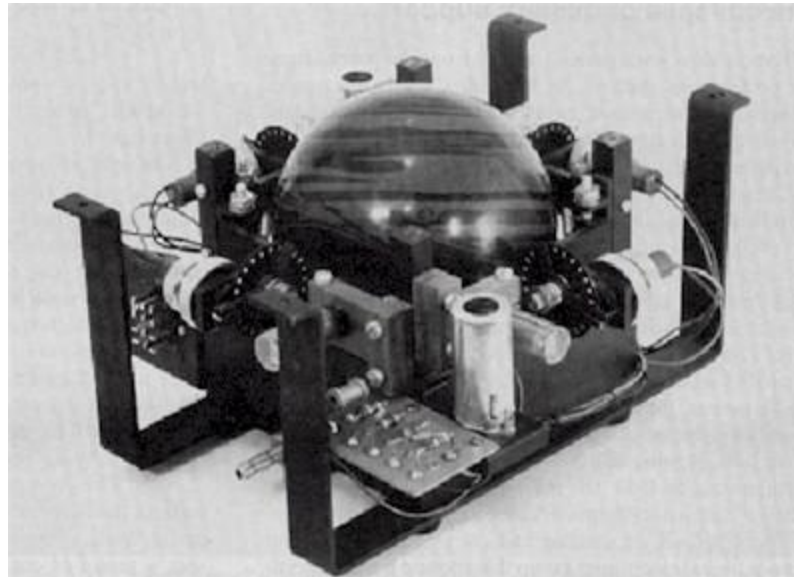
- 1963, Ivan Sutherland, MIT. Sketchpad program. Lines, circles, and points could be drawn on a screen using a light pen.



# History of HCI (cont)

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- 1970s, Xerox's Palo Alto Research Center, Altus & STAR systems. Mouse (pointing & selecting).





# History of HCI (cont)

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- 1974, Xerox. Today's mouse.





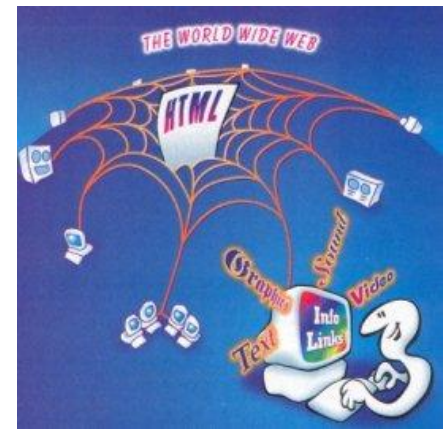
# History of HCI (cont)

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- 1984, Apple. Macintosh
- 1985, Microsoft. Windows 1.0
- 1987, Apple. Macintosh II. The first color Macintosh.
- IBM. System Application Architecture and Presentation Manager. Graphics OS replacement for DOS.
- 1988, NeXT. NeXTStep, 3-d Screen simulation.
- UNIX-based GUIs.

# The Blossoming of the World Wide Web

- 1960s, Licklider, MIT. Proposed a global network of computers & moved to DARPA.
- 1969. ARPANET. 4 major universities.
- 1974, Bolt, Beranek, & Newman. Telnet. Commercial version of ARPANET.
- 1970s. TCP/IP. Common language of all Internet computers.
- 1982. "Internet"



# The Blossoming of the World Wide Web (cont.)



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- 1991, Gopher, University of Minnesota. First really friendly interface.
- 1989, European Laboratory for Particle Physics. Hypertext protocol. HTML (Hypertext Markup language).
- 1991, Berners-Lee. World Wide Web.



# Web vs. Internet

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- Global information space in which people can read & write using computers connected to the Internet.
- The Web is a service that operates over the Internet, just as e-mail operates over the Internet (Wikipedia.org, 2006).

# The Blossoming of the World Wide Web (cont.)



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- 1993, NCSA at Univ. of Illinois. Mosaic. First popular graphics-based hypertext browser.
- 1994. Netscape Navigator
- 1995, Microsoft. Internet Explorer
- 1994. NSF stopped support. W3C formed to promote & develop standards for the Web.
- 2003, Apple. Safari 1.0
- 2004. Mozilla Firefox

# A Brief History of Screen Design

- 1970s, IBM. 3270 cathode ray tube text-based terminal





# 1970s screen

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TDX95210

THE CAR RENTAL COMPANY

10/11/76 10:25

NAME

TEL

RO

\_\_\_\_\_

PUD

RD

C

RT

MPD

\_\_\_\_\_

ENTRY ERROR XX465628996Q.997

Command===>





# A Brief History of Screen Design (cont.)

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- 1970s screens
  - Cryptic & unintelligible captions
  - Always had to remember what to type
  - Ambiguous messages
  - Monochromatic, green text on black background



# 1980s screen

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## THE CAR RENTAL COMPANY

RENTER >>      Name: \_\_\_\_\_  
                 Telephone: \_\_\_\_\_

LOCATION >>      Office: \_\_\_\_\_  
                 Pick-up Date: \_\_\_ \_\_\_ \_\_\_  
                 Return Date: \_\_\_ \_\_\_ \_\_\_

AUTOMOBILE >>      Class: \_\_\_\_\_ (PR, ST, FU, MD, CO, SC)  
                 Rate: \_\_\_\_\_  
                 Miles Per Day: \_\_\_\_\_

The maximum allowed miles per day is 150.

Enter    F1=Help    F3=Exit    F12=Cancel



# A Brief History of Screen Design (cont.)

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- 1980s
  - Grouping & alignment
  - Clear captions
  - Command list (+ function keys)
  - Instructions had to be inscribed



# 1990s and beyond

THE CAR RENTAL COMPANY

RENTER

Name:

Telephone:

LOCATION

Office:

Pick-up Date:

Return Date:

AUTOMOBILE

Class:

Rate:

Miles Per Day:



# A Brief History of Screen Design (cont.)

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- 1990s and beyond
  - Borders
  - Buttons
  - Menus
  - Different font sizes, styles, colors, etc.
  - List boxes, drop-down combination boxes, etc.
  - Screens modified