The Importance of the User Interface

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?

- 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?

- **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

- To make working with a computer

  - EASY
  - PRODUCTIVE
  - ENJOYABLE

Examples

- 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]
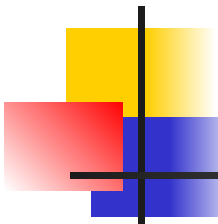
PIF Editor

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

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.)

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
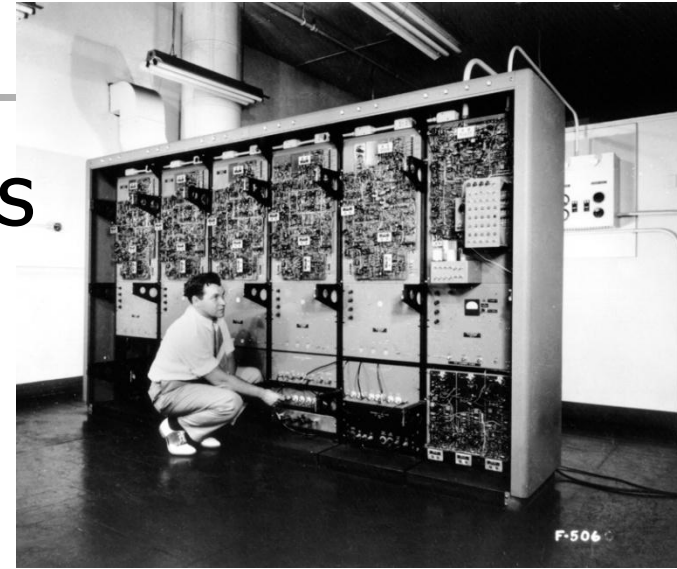
What is GUI?

- 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)
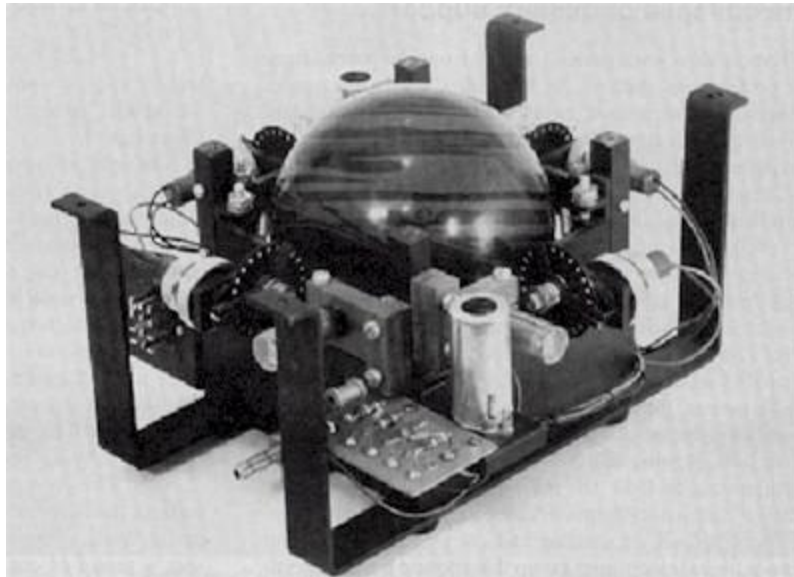
History of HCI (cont)

- 1963, Ivan Sutherland, MIT. Sketchpad program. Lines, circles, and points could be drawn on a screen using a light pen.
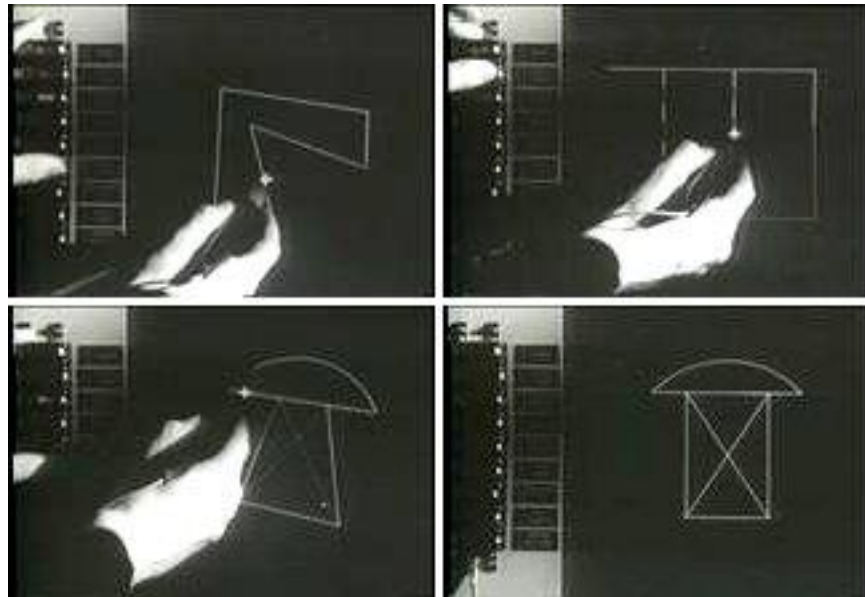
History of HCI (cont)

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

History of HCI (cont)

- 1974, Xerox. Today's mouse.

History of HCI (cont)

- 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"
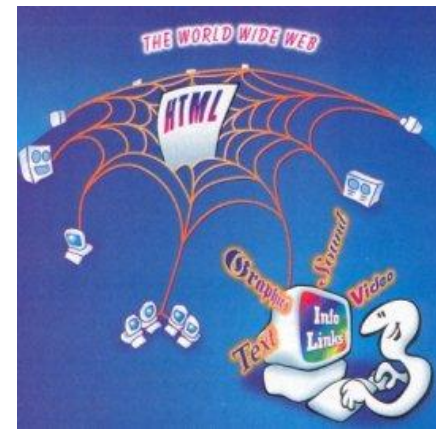
The Blossoming of the World Wide Web (cont.)

- 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

- 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.)

- 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

```
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.)

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

1980s screen

THE CAR RENTAL COMPANY

RENTER >>

Name: _____

Telephone: ____ ____ _____

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.)

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

1990s and beyond

A Brief History of Screen Design (cont.)

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