

Introduction to Graphical User Interfaces

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Instructor:

Wayne Summers

Room 453, CCT Building

Phone: 706-507-8170

Email: wsummers@columbusstate.edu

Today's Schedule

- Introductions
- Syllabus
- GUI Design Principles

Introductions – About you ...

- Your name, major track
- What you do apart from studying
- Your favorite course so far – and the one you've found most difficult
- What you expect to gain from this class

Syllabus

What is User Interface?



“You can't just punch in 'let there be light' without writing the code underlying the user interface functions.”

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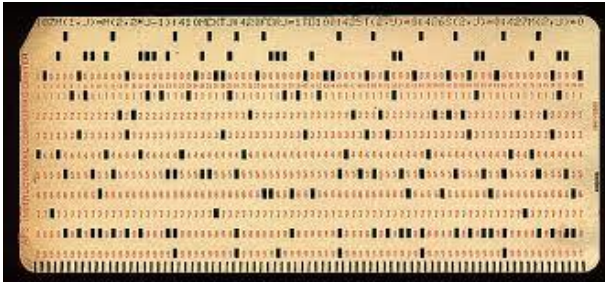
What is User Interface?

- The **user interface** is the aggregate of means by which people interact with the system—a machine, computer program or other complex tool.
- Two components:
 - Input, allowing the users to manipulate a system
 - Output, allowing the system to indicate the effects of the users' manipulation.

A Brief History of the Human-Computer Interface

Punch cards, Line printers	Early computers (1950s-60s)
Keyboards, Monitors	Command language based (1970s-1980s)
Mouse, trackball, touch pad, touch screens	Graphical User Interfaces (GUIs) (1990s -)
Multitouch screen, Voice, synthesized speech, gesture	“Intelligent” interfaces (2000s -)

Punch card, keypunch and then VDU



Command Line User Interface



```
Microsoft[R] Windows DOS
(C)Copyright Microsoft Corp 1990-2001.

C:\>mem

        655360 bytes total conventional memory
        655360 bytes available to MS-DOS
        578352 largest executable program size

        4194304 bytes total EMS memory
        4194304 bytes free EMS memory

        19922044 bytes total contiguous extended memory
           0 bytes available contiguous extended memory
        15580160 bytes available XMS memory
           MS-DOS resident in High Memory Area

C:\>start

Windows XP Service Pack 2 starting.
Please Wait.

Loading ...
```

A Brief History of the Graphical User Interface in 77 seconds

- <http://www.youtube.com/watch?v=TZGGUrom1Mg&feature=related>
- The MS Surface
- <http://www.youtube.com/watch?v=6VfpVYYQzHs>
- The MS Surface – a different take
- <http://www.youtube.com/watch?v=CZrr7AZ9nCY>

Why User Interface is Important

- User needs must be satisfied in an effective and satisfying way
- User focus should be on the task, instead of the mechanism to perform the task.
- How would you describe a poorly designed user interface?

The Costs of Badly Designed Interfaces



The Costs of Badly Designed Interfaces

- Confusion leads to mistakes, loss of productivity
- Bad interfaces frustrates user, discourages use
- Financial loss for user
- Loss of market share for vendor



An Example of poor Design



You can sign in to your account and then choose security options ... or can you?

http://slostc.org/topics/usability/poor_ui_examples.html

Impact of Inefficient Screen Design on Processing Time (Galitz, 2007)

ADDITIONAL SECONDS REQUIRED PER SCREEN IN SECONDS	ADDITIONAL PERSON-YEARS REQUIRED TO PROCESS 4.8 MILLION SCREENS PER YEAR
1	.7
5	3.6
10	7.1
20	14.2

Benefits of good Design

Benefits of good Design

- ✓ Increased productivity
- ✓ Lower training time
- ✓ Lower customer support line costs
- ✓ More satisfied customers

Rule of thumb: \$1 invested in system usability returns \$10 to \$100 (IBM, 2001)

User Interface Design Guidelines

- “When developing an application, you should carefully plan the design of its user interface. A correctly designed user interface should be simple, self-explanatory, and without distracting features” (*Gaddis & Irvine, p. 801*)

Some User Interface Design Guidelines

- Provide a menu system
- Use color wisely
 - Use dark text on a light background
 - Use predefined Windows colors
 - Avoid bright colors
- Avoid nonstandard fonts
- Define a logical tab order

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User Interface Design Guidelines (cont)

- Assign tool tips
- Provide keyboard access
- Group controls
- Position forms appropriately
- Provide a splash screen