

# Week 11-2

# Interface Patterns and Types

SFWRENG 4HC3/6HC3 Human Computer Interfaces

*\* Slides adapted from previous and current instructors of COMPSCI/SFWRENG 4HC3/6HC3 (Danny Papagiannis, Geneva Smith) and CSE 440 from University of Washington (Amy Zhang)*

# Week 11 Overview

- **Monday**
  - Interface Implementations
- **Wednesday**
  - Interface Design Patterns
  - Interface Types
- **Friday**
  - Interface Types
  - Interaction Types

# What is a design pattern?

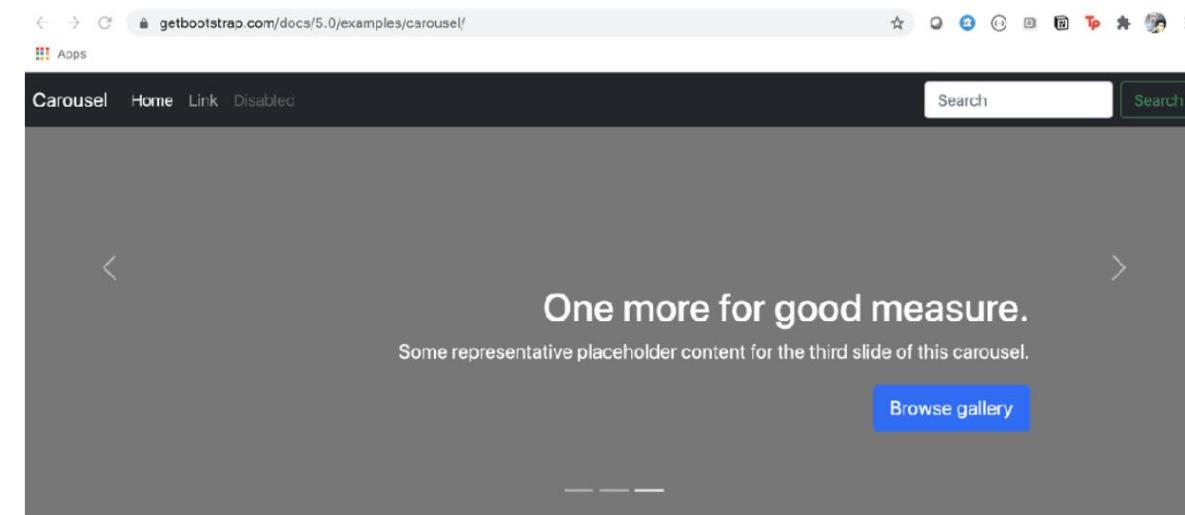
“... a general repeatable solution to a commonly-occurring usability problem in interface design...”

- Different from design principles in that they provide abstractions of tangible **solutions**, as opposed to guidelines to follow.
- Patterns often **incorporate principles**.
- UI toolkits oftentimes incorporate patterns.

# Design Pattern: Example

## UI Toolkit: Bootstrap

- ...includes the **design pattern**:
  - picture carousel landing page
- ...can incorporate important **design principles** such as:
  - flexibility and efficiency of use  
(a heuristic we will talk later)



# Design Pattern: Activity

Here is a really old website! Take **2 minutes** to see if you can **spot some interface design patterns**. What are some patterns that are still used today?

NEW: Counting Crows: Hard Candy \$11.88 Save 37%!

my account cart help eBay home sign in

half.com by eBay

Home Books Music DVDs/Movies Video Games Computers & Software Electronics Everything Else...  
Gift Certificates Wish List Pre-Orders Sell Your Stuff New Users  
Search: All Categories go

The Smartest Place to Buy and Sell Books, Music, Computers, Electronics, DVDs & more...

Welcome

Learn about Buying  
Learn about Selling  
Register Now!  
Announcement Board  
Updated Jun 13, 2002

DESKTOP LIQUIDATION CENTER as low as \$249!

New CD Releases! only \$11.88

More Hot New Releases!

Red Hot Price for the Chili Peppers' New CD: \$11.88!  
Evolving after the popularity of *Californication*, the Chili Peppers release a new album featuring the hit song "By the Way".

	Our Price	List Price
Weezer, Weezer	\$6.99	\$18.97
Gutterflower, Goo Goo Dolls	\$9.00	\$18.98
The Slim Shady LP, Eminem	\$2.98	\$18.97
Echoes, Pink Floyd	\$11.54	\$24.97
18, Moby	\$10.99	\$18.98

In-Stock Now!

Movies

Just Released: *The Royal Tenenbaums* for \$18.45  
Wes Anderson (*Rushmore*) directs a motley crew of talented actors in this hysterical comedy about the rise and fall of an eccentric family.

	Our Price	List Price
Monsters Ball (DVD)	\$11.25	\$24.99

Advance Orders

The Simpsons: Complete 2nd Season (DVD) \$34.97 Save 30%!

The Sopranos: Complete 3rd Season (DVD) \$67.99 Save 32%!

Tom Clancy: Red Rabbit (Hardcover) \$19.40 Save 33%!

In Computers

Gateway Desktop Under \$400! \$399.00

Includes an 800MHz Intel Celeron processor, 256MB RAM, 20GB hard drive, DVD-ROM drive, and more!

Save Over \$100 on Dell Latitude CPx! \$639.00

Get the best quality at the best price with the Dell Latitude CPx featuring an Intel Pentium III® 500 MHz processor, 256 MB RAM and 12 GB hard drive.

Gateway Desktop Under \$500 \$499.00

Includes a 1GHz Intel Pentium III processor, 256MB RAM, 20GB hard drive, CD-RW drive, 250MB ZIP Drive, and more!

More great deals...

# Design Pattern: Activity

**Logo:** Site logo in top-left corner, probably clickable to get to homepage

NEW: Counting Crows: Hard Candy \$11.88 Save 37%!

my account cart help ebay home sign in

Home Books Music DVDs/Movies Video Games Computers & Software Electronics Everything Else...

Gift Certificates Wish List Pre-Orders Sell Your Stuff New Users

Search: All Categories go

The Smartest Place to Buy and Sell Books, Music, Computers, Electronics, DVDs & more...

New CD Releases! only \$11.88

More Hot New Releases!

Welcome

Learn about Buying  
Learn about Selling  
Register Now!  
Announcement Board  
Updated Jun 13, 2002

DESKTOP LIQUIDATION CENTER as low as \$249!

Categories

Books  
Textbooks, Fiction, Biography, Cooking, Business, & more...

Music  
Rock, Hip Hop/Rap, Country, Pop, eBay items, & more...

Movies/DVDs  
Action, Comedy, Children's, Romance, Animation, & more...

Games  
PS2, Xbox, GameCube, Dreamcast, N64, & more...

Advance Orders

The Simpsons: Complete 2nd Season (DVD) \$34.97 Save 30%

The Sopranos: Complete 3rd Season (DVD) \$67.99 Save 32%

Tom Clancy: Red Rabbit (Hardcover) \$19.40 Save 33%

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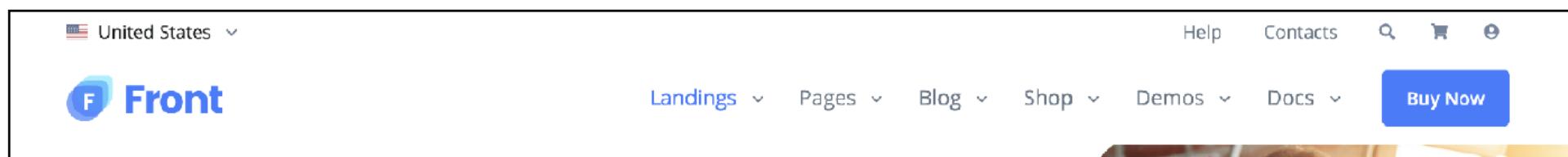
Includes a 1GHz Intel Pentium III processor, 256MB RAM, 20GB hard drive, CD-RW drive, 250MB ZIP Drive, and more!

More great deals...

# Design Pattern: Activity



**Navbars:**  
navbar and  
search at the  
top, account  
settings, cart in  
top right



# Design Pattern: Activity

The screenshot shows the half.com website interface. A red box highlights the left sidebar, which contains sections for Welcome, Categories (Books, Music, Movies/DVDs, Games), and various promotional banners for Desktop Liquidation Center, Red Hot Price, and In-Stock Now items.

The screenshot shows the Shopper. website interface. A red box highlights the left sidebar, which contains sections for Home, Catalog, Shop, Pages, and Blog, each with a dropdown arrow indicating further options.

The screenshot shows the Amazon Books sidebar. It includes sections for Popular in Books (Award Winners, Bargain Books, Best Books of the Month, etc.), More in Books (100 Books to Read in a Lifetime, Amazon Book Review, etc.), Textbooks (Textbooks Store, Textbook Rentals, Kindle eTextbooks), Kindle & Audible (Audible Audiobooks, Kindle eBooks, Kindle Deals, Kindle Unlimited, Prime Reading), and New Releases (Last 30 days, Last 90 days, Coming Soon). The sidebar also features images of books and authors.

Sidebars  
faceted  
browsing

# Design Pattern: Activity

The screenshot shows the homepage of half.com, a eBay subsidiary. A red box highlights the left sidebar, which contains a 'Welcome' section with links to buying and selling guides, an announcement board, and a desktop liquidation center. Below this is a 'Categories' section with links to Books, Music, Movies/DVDs, and Games. Another red box highlights the top navigation bar, which includes links for Home, Books, Music, DVDs/Movies, Video Games, Computers & Software, Electronics, Everything Else..., Gift Certificates, Wish List, Pre-Orders, Sell Your Stuff, and New Users. A search bar is also present.

## The “L” shape navigation

The screenshot shows the homepage of the Group for User Interface Research. A red box highlights the top navigation bar, which includes links for Home, Projects, People, Publications, and Links. Another red box highlights the left sidebar, which contains a 'DENIM and SILK' section with links to Denim Lab, Documentation, Support, Records, Publications, and Mine Projects. Below this is a 'Gateway DE \$399.00' section with a description of the product and a link to Mine Projects. A 'Buy today, ship today' button is also visible.

# Design Pattern: Activity

Announcement Board  
Updated Jun 13, 2002

DESKTOP LIQUIDATION CENTER as low as \$249!

Categories

- Books  
Textbooks, Fiction, Biography, Cooking, Business, & more...
- Music  
Rock, Hip Hop/Rap, Country, Pop, eBay items, & more...
- Movies/DVDs  
Action, Comedy, Children's, Romance, Animation, & more...

More Hot New Releases!

Red Hot Price for the Chili Peppers' New CD: \$11.88!  
Evolving after the popularity of *Californication*, the Chili Peppers release a new album featuring the hit song "By the Way".

In-Stock Now!	Our Price	List Price
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Gateway Desktop Under \$500 \$499.00  
Includes a 1GHz Intel Pentium

**Tables:** Tabular view of data.  
Alternate colors of rows, etc.

## Striped rows

Use `.table-striped` to add zebra-striping to any table row within the `<tbody>`.

#	First	Last	Handle
1	Mark	Otto	@mdo
2	Jacob	Thornton	@fat
3	Larry	the Bird	@twitter

# Design Pattern: Activity

**Grid Layout:** with header, 3 columns, and a main center column

These layouts have been with us since paper newspapers and pamphlets!



The screenshot shows the homepage of half.com, which is a eBay subsidiary. The layout is a grid with the following structure:

- Header:** Includes the half.com logo, a search bar, and navigation links for Home, Books, Music, DVDs/Movies, Video Games, Computers & Software, Electronics, and Everything Else...  
Gift Certificates, Wish List, Pre-Orders, Sell Your Stuff, and New Users.
- Left Column (Categories):** Welcome, Learn about Buying, Learn about Selling, Register Now!, Announcement Board (Updated Jun 13, 2002), Desktop Liquidation Center (as low as \$249!).
- Center Column (Main Content):**
  - New CD Releases!** Only \$11.88. Features images of CDs by Counting Crows, Chili Peppers, and Greenhornes.
  - Music** category listing: Red Hot Price for the Chili Peppers' New CD: \$11.88! (Evolving after the popularity of *Californication*, the Chili Peppers release a new album featuring the hit song "By the Way").
  - In-Stock Now!** table:

	Our Price	List Price
Weezer	\$6.99	\$18.97
Gutterflower	\$9.00	\$18.98
The Slim Shady LP	\$2.98	\$18.97
Echoes	\$11.54	\$24.97
18, Moby	\$10.99	\$18.98
  - Movies** category listing: Just Released: *The Royal Tenenbaums* for \$18.45 (Wes Anderson (*Rushmore*) directs a motley crew of talented actors in this hysterical comedy about the rise and fall of an eccentric family).
  - In-Stock Now!** table:

	Our Price	List Price
Monster's Ball (DVD)	\$11.25	\$24.99
- Right Column (Side Content):** Advance Orders (listing *The Simpsons: Complete 2nd Season (DVD)* for \$34.97, *The Sopranos: Complete 3rd Season (DVD)* for \$67.99, and *Tom Clancy: Red Rabbit* (Hardcover) for \$19.40), and In Computers (listing *Gateway Desktop Under \$400!* for \$399.00 and *Gateway Desktop Under \$500!* for \$499.00).

# Design Pattern: Common User Flows

- Shopping checkout: shipping -> billing -> summary -> place order
- **User flows** are an important component of user experience (UX) design and consists of a **sequence of UI states** that represent **semantically meaningful tasks** such as searching or composing.

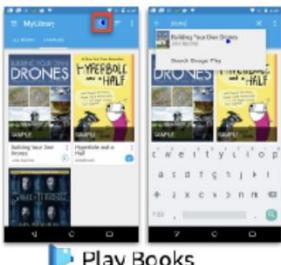
The screenshot shows a web page from half.com, which is a subsidiary of eBay. At the top, there's a navigation bar with the half.com logo and a search bar. Below the navigation, a yellow header bar indicates the current step: "Step 1 - Choose Shipping Address". The main content area is titled "Ship my order to:" and contains a form field with the following address:  
Jason Hong  
387 Soda Hall Computer Science UC Berkeley  
Berkeley, CA 94720  
To the right of the address is a red button labeled "Use This Address". Below this section, there's an "OR" link followed by another form field titled "Enter a new shipping address:" with input fields for "Name" and "Street address". In the top right corner of the page, there's a "Secure Shopping" badge with a lock icon.

# Design Pattern: Common User Flows

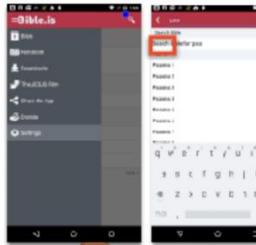
## Common mobile app UI flows

**Searching**

ICONS: TEXT: search



Play Books



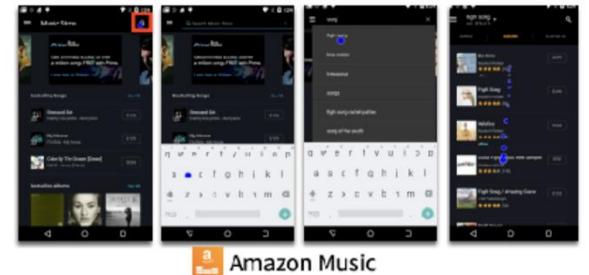
Bible



Walmart



YouTube

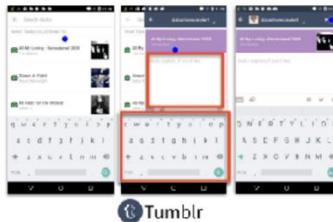


Amazon Music

Deka, Biplab, Zifeng Huang, and Ranjitha Kumar. "ERICA: Interaction mining mobile apps." *Proceedings of the 29th Annual Symposium on User Interface Software and Technology*. 2016.

**Composing**

Keyboard Deployed + Occupies 60% of Remaining Screen



Tumblr



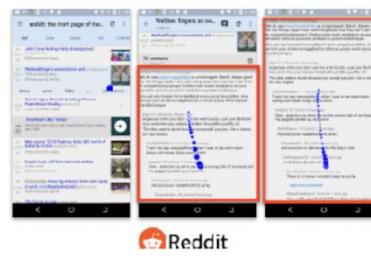
Clipper



WeHeartIt

**Consuming**

2000 Characters Android in TextView + 2 Scroll Interactions



Reddit



Fox News



Cricbuzz

# Design Pattern & Design System

- **Design/UI Patterns**

- Components
- Templates

- **Building Blocks**

- Color Schemes
- Icons/Image Assets

- **Rules**

- Implementation Guidelines
- Do's and Don'ts

**Example:**

Fluent (Microsoft)

Material Design (Google)

Carbon Design System (IBM)

# Design System: Material Design

<https://m3.material.io/>

- **Styles**
  - Elevation
  - Motion
- **Components**
  - FAB
  - Cards

Overview Applying elevation Tokens

Elevation is measured as the distance between components along the z-axis in density-independent pixels (dps).

On this page

**Elevation**

What's new

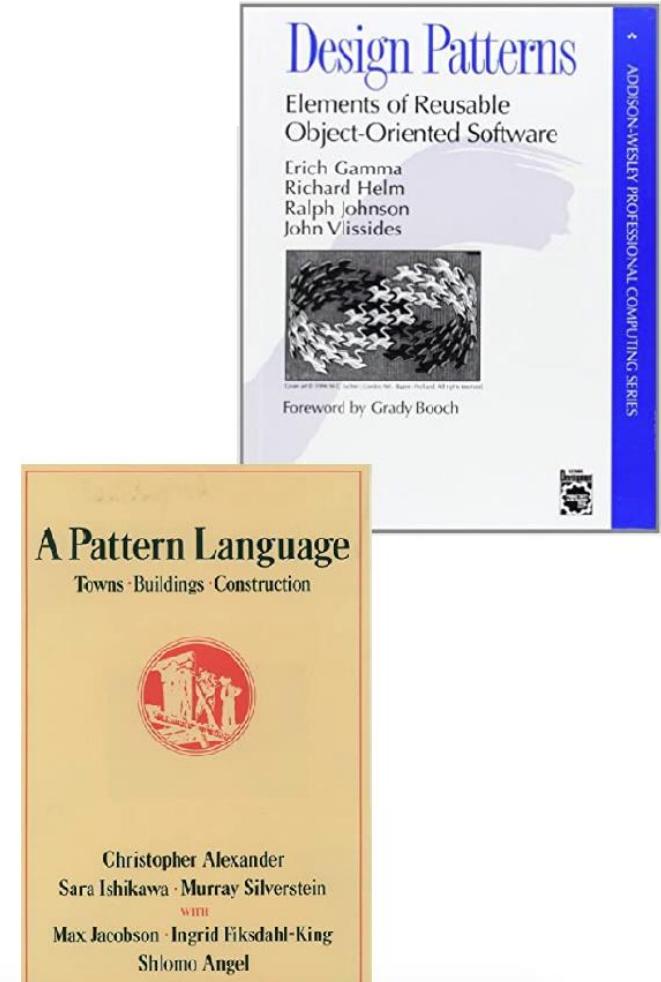
All surfaces and components have elevation values

1 One surface at 1dp elevation and another surface at 8dp elevation, as viewed from the front

2 The difference in elevation between the two surfaces is 7dp, as viewed from the side

# Design Pattern in General

- Very popular in **software engineering and OOP** after the mid 90s.
  - **Model-View-Controller** (MVC) is a common software design pattern for developing UIs.
- A 1970s book talks about “**pattern languages**” and relates it to architecture and the planning of cities and towns. This book later influenced **software engineering and the first wiki**.



# UI Patterns for Your Project

- **Don't need to reinvent the wheel!**
- You want to focus on where your UI is interesting and innovative, not in the login flow (probably)
- **Find patterns for your high-fidelity prototype**
  - <https://ui-patterns.com/patterns>
  - Many more out there!

## Design patterns



User Interface Design patterns are recurring solutions that solve common design problems. Design patterns are standard reference points for the experienced user interface designer.

Design patterns provide a common language between designers. They allow for debate over alternatives, where merely mentioning the name of a design pattern implicitly carries much more meaning than merely the name.

Dive into the patterns below to learn a common language of web design.

### User Interface Design Patterns

Getting input	Navigation	Dealing with data	Social
<b>Forms</b> Password Strength Meter Morphing Controls Structured Format Expandable Input Drag and drop Keyboard Shortcuts Data Builders	<b>Tabs</b> Navigation Tabs Module Tabs <b>Jumping in hierarchy</b> Shortcut Dropdown Breadcrumbs Fat Footer	<b>Tables</b> Table Filter Sort By Column Alternating Row Colors <b>Formatting data</b> Frequently Asked Questions (FAQ) Dashboard	<b>Reputation</b> Collectible Achievements Testimonials Leaderboard <b>Social interactions</b> Activity Stream Reaction



### Become a confident designer

Practical cards to quickly understand and apply complex concepts that will move your product forward

Stop winging it and bring hard facts about we behave, decide, and take action to the table.

[Get our cards](#)

# Design Pattern: Why

- Design is about **finding solutions** to problems
- Many problems are **shared**
- Some solutions are **better** than others
- Designers often **reinvent** because they don't realize a pattern exists
  - Sometimes it's better to **reuse** a common solution for a common problem (cognition!)
- Design patterns are **a tool for knowledge sharing**

# Design Pattern: Creativity

- Patterns come from **successful examples**
  - Sites that are so successful that lots of people are familiar with their paradigms
  - Interaction techniques/metaphors that work well across many sites (e.g., shopping carts)
- Not too general and not too specific
  - You need to specialize to your needs •
- Patterns let you focus on the hard, unique problems of your design situation
- Patterns help design without over-constraining

# Design Pattern: Pre-Patterns

- Patterns require **broad** adoption and examples
  - **Many** version of the same basic idea
  - Shown **successful** in many contexts
  - That is what makes them patterns
- This is challenging in **novel** domains
- Pre-patterns are based in weaker evidence
  - Can help **speed diffusion** of techniques and results
  - Can help see **relationships** among ideas

# Pre-Patterns, Anti-Patterns, Dark Patterns

- When you see advice, **consider its depth**
  - Result of an individual study
  - Pre-pattern based on some meta-analysis
  - Established pattern
- Be aware of misapplying patterns
- And be aware of anti-patterns (e.g., “Click here”)
- Don’t recreate dark patterns
  - **Unethical patterns** that trick users

TODAY'S SALE! - VALID ONLINE ONLY - \*Up To 45% Off + Free Local Delivery

① Delivery Info      ② Billing Info      ③ Review & Place Order

Need assistance? We are here to help! Call us any time at 877-638-3303

Log in to apply your points or discounts and earn even more points towards future purchases

**SHOPPING CART**

Item	Qty	Price	Subtotal
Dreaming of Tuscany Selected: "As Shown" 2nd choice: similar as possible, same look and feel	1	\$52.99	\$52.99
Greeting Card Service Selected: "STANDARD"	1	\$3.99	\$3.99

**NAGGING**  
Redirection of expected functionality that persists beyond one or more interactions.

**OBSTRUCTION**  
Making a process more difficult than it needs to be, with the intent of dissuading certain action(s).

**SNEAKING**  
Attempting to hide, disguise, or delay the divulging of information that is relevant to the user.

**INTERFACE INTERFERENCE**  
Manipulation of the user interface that privileges certain actions over others.

**FORCED ACTION**  
Requiring the user to perform a certain action to access (or continue to access) certain functionality.

Kai Lukoff, Alexis Hiniker, Colin M. Gray, Arunesh Mathur, and Shruthi Sai Chivukula.  
2021. What Can CHI Do About Dark Patterns? In Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA '21)

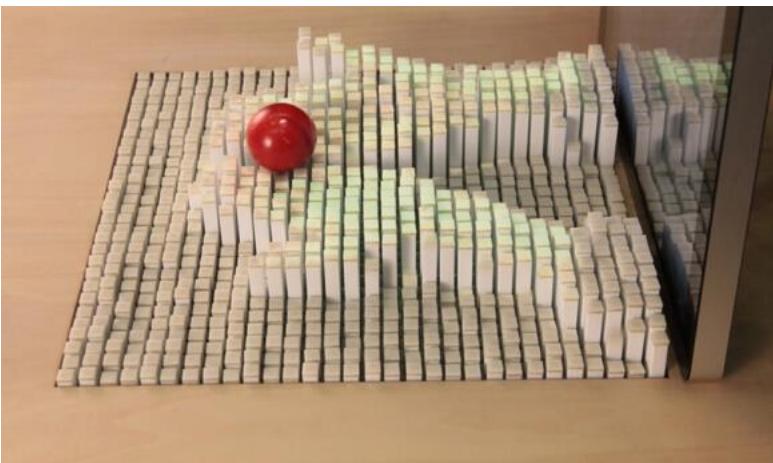
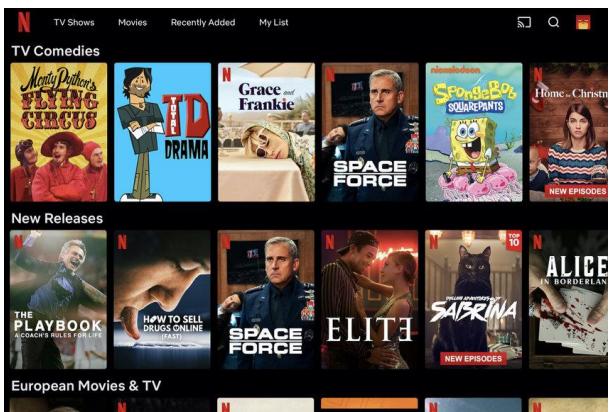
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- **Friday**
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  - Interaction Types

# What is an interface?



# Computing Interfaces



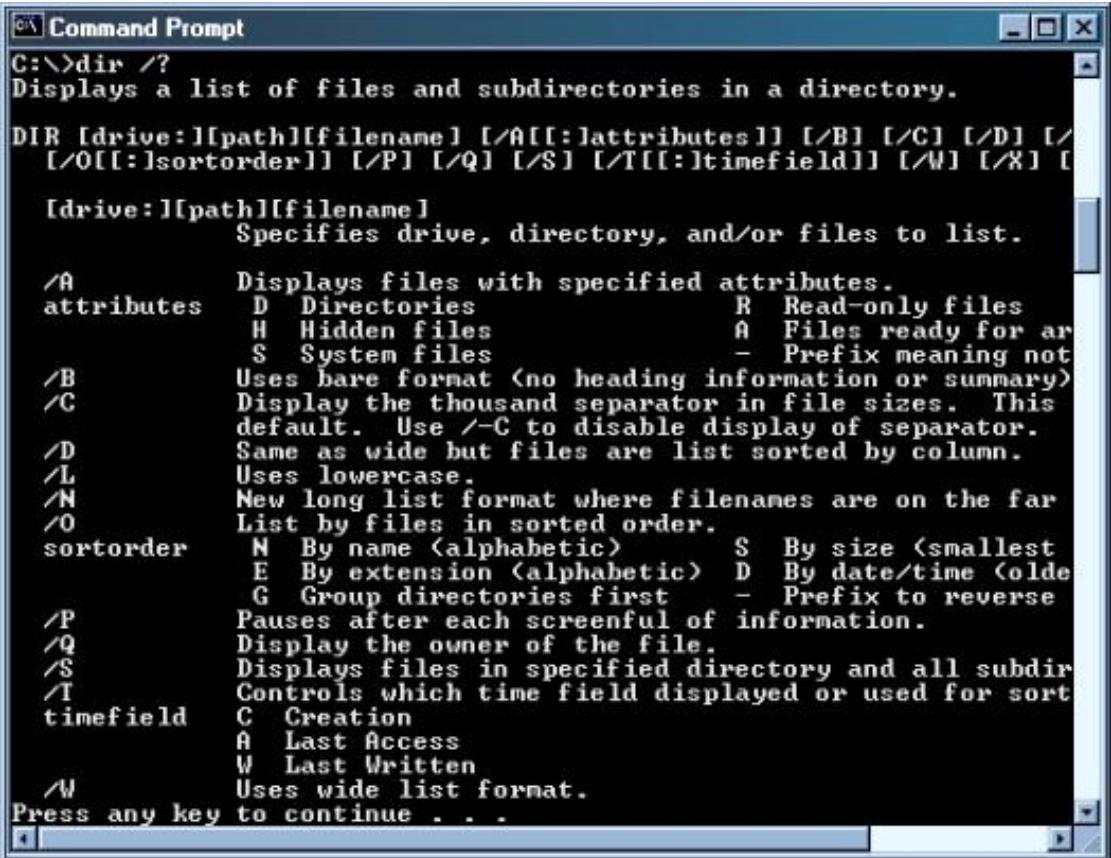
# Interface Types: Overview

- Command Line Interface
  - Graphical User Interface (GUI)
  - Mobile Interface
  - Touch/Multitouch Interface
  - Gesture-based Interface
  - Tangible Interface
  - Voice User Interface
  - Conversational Interface
- Wearable Interface
  - Augmented Reality Interface (AR)
  - Virtual Reality Interface (VR)
  - Robots/Drones

NATURAL INTERFACE

# Command Line Interface (CLI)

- **Text or button-based** (e.g., Ctrl+Alt+Del)
- Can be **easier and faster** than equivalent menu-based systems



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The command entered is "C:\>dir /?". The output provides detailed information about the DIR command, including its syntax and various switches:

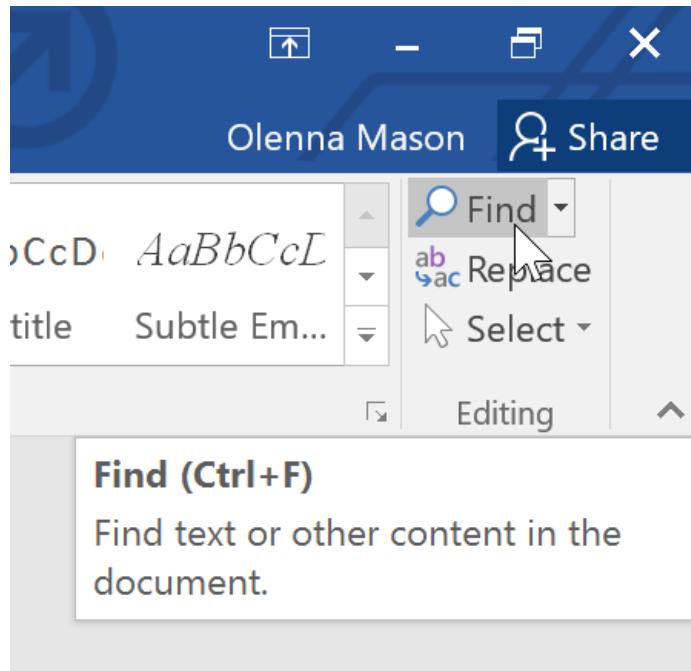
```
C:\>dir /?
Displays a list of files and subdirectories in a directory.

DIR [drive:][path][filename] [/A[:attributes]] [/B] [/C] [/D] [/
[O[:sortorder]] [/P] [/Q] [/S] [/T[:timefield]] [/W] [/X] [
[drive:][path][filename]]
      Specifies drive, directory, and/or files to list.

/A       Displays files with specified attributes.
attributes   D Directories          R Read-only files
              H Hidden files        A Files ready for ar
              S System files         - Prefix meaning not
/B       Uses bare format (no heading information or summary)
/C       Display the thousand separator in file sizes. This
        default. Use /-C to disable display of separator.
/D       Same as wide but files are list sorted by column.
/L       Uses lowercase.
/N       New long list format where filenames are on the far
        List by files in sorted order.
/O       By name (alphabetic)    S By size (smallest
        By extension (alphabetic) D By date/time (olde
        Group directories first  G Group directories first - Prefix to reverse
/P       Pauses after each screenful of information.
/Q       Display the owner of the file.
/S       Displays files in specified directory and all subdir
/T       Controls which time field displayed or used for sort
        C Creation
        A Last Access
        W Last Written
/W       Uses wide list format.

Press any key to continue . . .
```

# Command Line Interface (CLI)



```
aditya314@ubuntu:~  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Templates  
-rw-rw-r-- 1 aditya314 aditya314    0 Apr 27 02:55 Untitled Document  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Videos  
-rw-rw-r-- 1 aditya314 aditya314  268 Mar  5 04:17 xyz.txt  
aditya314@ubuntu:~$ chmod o+x xyz.txt  
aditya314@ubuntu:~$ ls -l  
total 52  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Desktop  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Documents  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Downloads  
-rw-r--r-- 1 aditya314 aditya314 8980 Mar  5 01:05 examples.desktop  
-rw-rw-r-- 1 aditya314 aditya314    0 Mar  5 03:53 ggf.txt  
-rw-rw-r-- 1 aditya314 aditya314    0 Apr 27 02:47 listfile  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Music  
drwxrwxr-x 2 aditya314 aditya314 4096 Mar  5 03:53 new one  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Pictures  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Public  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Templates  
-rw-rw-r-- 1 aditya314 aditya314    0 Apr 27 02:55 Untitled Document  
drwxr-xr-x 2 aditya314 aditya314 4096 Mar  5 01:21 Videos  
-rw-rw-r-x 1 aditya314 aditya314  268 Mar  5 04:17 xyz.txt
```

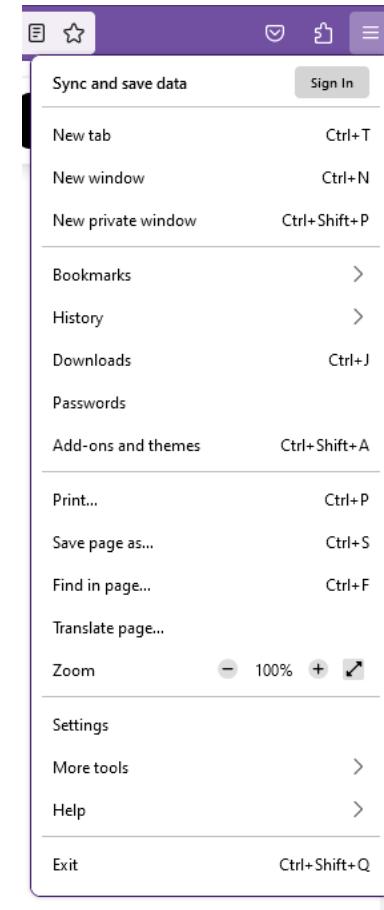
Expert Users

Batch Operation

# Command Line Interface (CLI)

## Design Considerations:

- Form of commands (e.g., names)
- Command syntax (e.g., how to combine commands)
- Organization of commands (e.g., structuring options)
- Consistency is critical (e.g., the first three letters of a command as an abbreviation)



# Graphical User Interface (GUI)

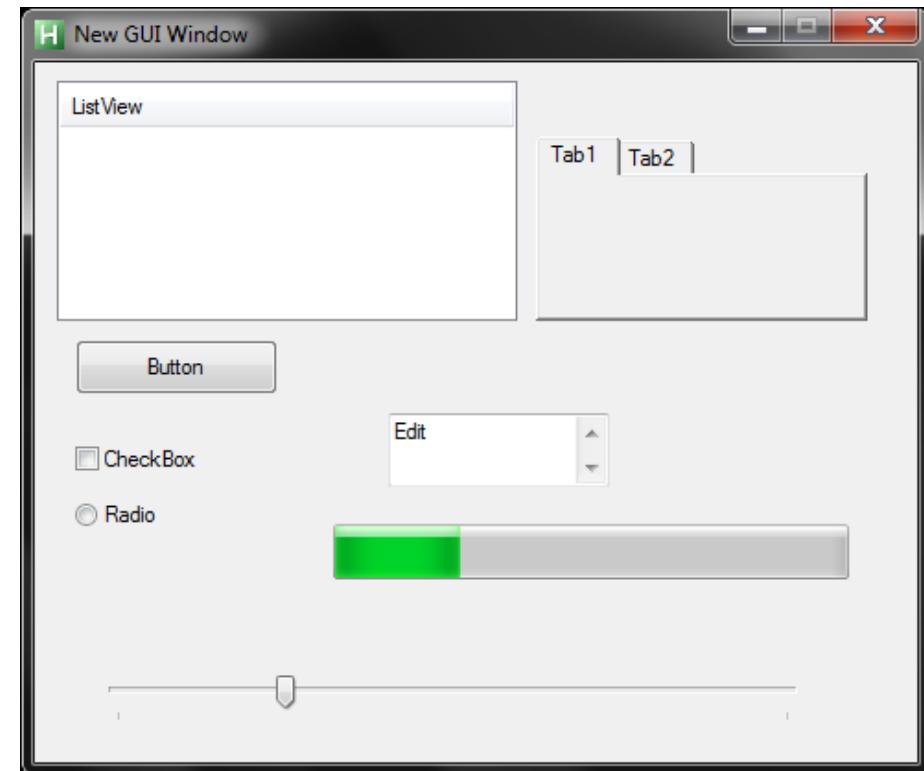
- Visual interface, including the use of color, typography, and imagery
- Original GUI was a **WIMP** (Windows, Icons, Menus, Pointers)
- Widget: standard representation of a user control



# Graphical User Interface: WIMP

## Window

- Sections of the screen that you can scroll, stretch, overlap, open, close, and move with a mouse
- Includes **widgets** such as dialogue boxes and interactive forms



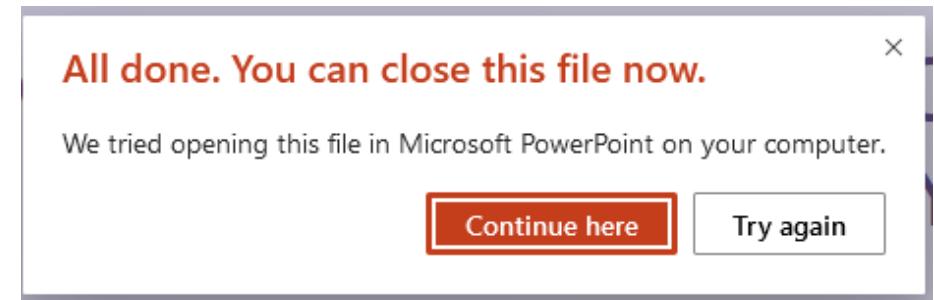
# WIMP: Window

## Pros

- Allows users to do multiple tasks with limited screen space
- Can guide users' interactions (e.g., setup wizards)

## Cons

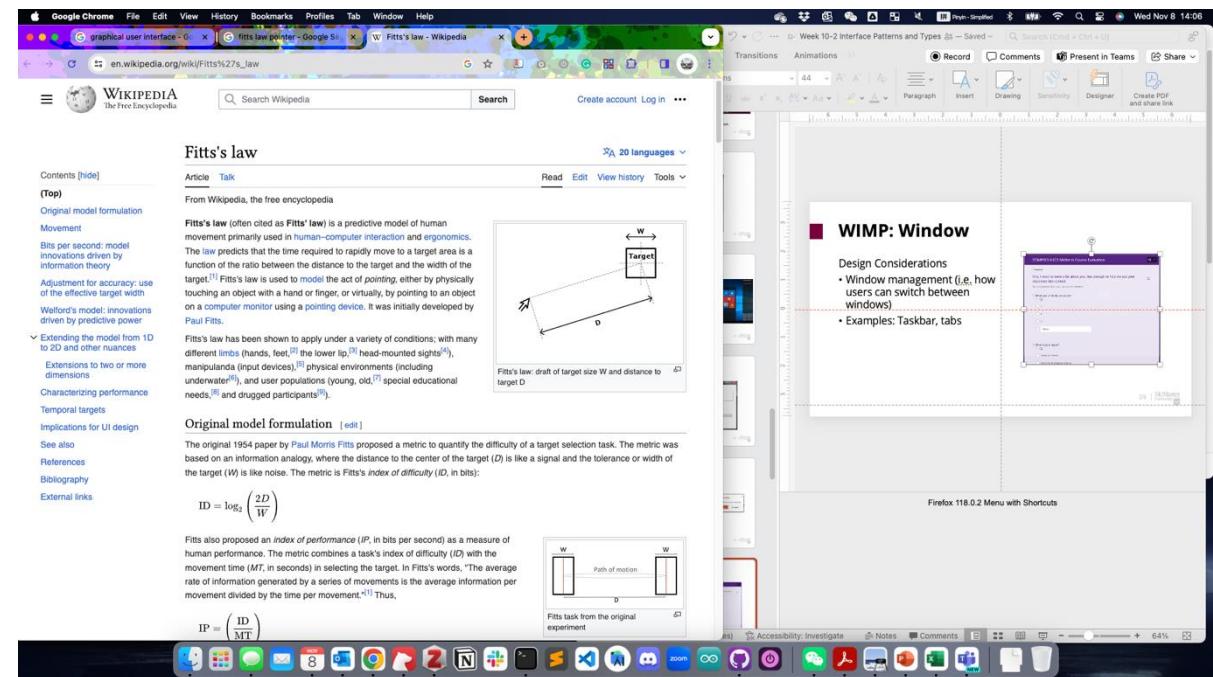
- Can have too much information at once



# WIMP: Window

## Design Considerations

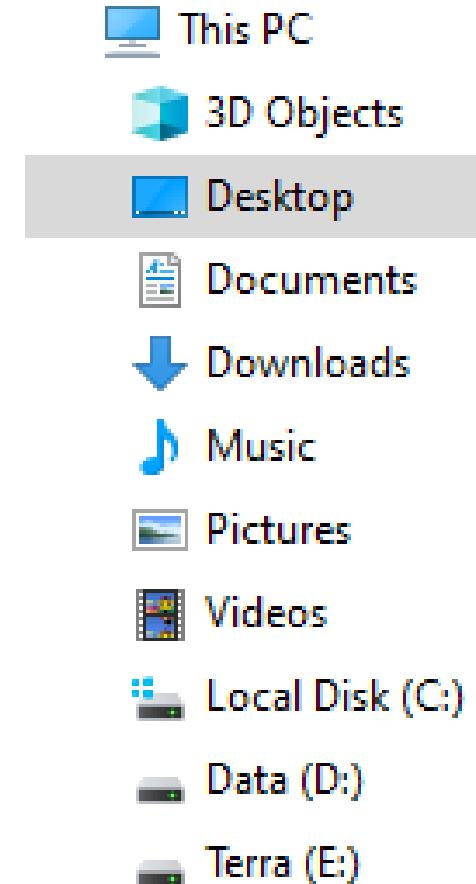
- Window management (i.e., how users can switch between windows)
- Examples: Taskbar, tabs



# Graphical User Interface: WIMP

## Icons

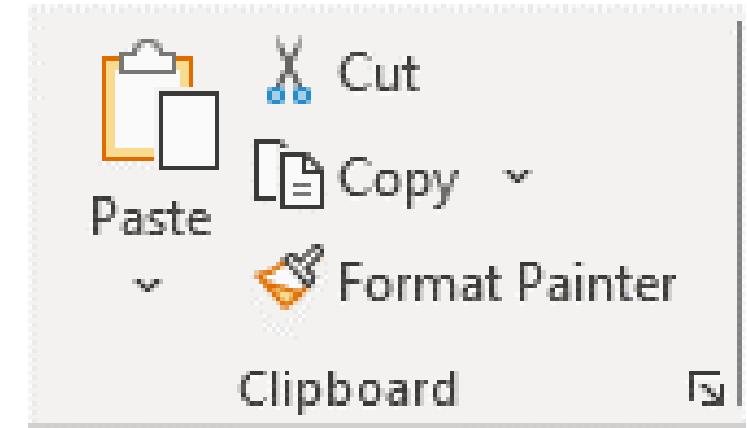
- Pictograms and ideograms representing applications, objects, commands, and tools
- Activated/opened by clicking on them
- Convey tools, status, categories, abstract functions
- Designed to be inviting, emotionally appealing, memorable, distinctive



# WIMP: Icons

## Pros

- Help build the users' conceptual model via metaphors (e.g., desktop)
- Might be easier to learn/remember compared to text for non-expert users



## Cons

- Simplicity might require additional cues to infer meaning from

# WIMP: Icons

## Design Considerations

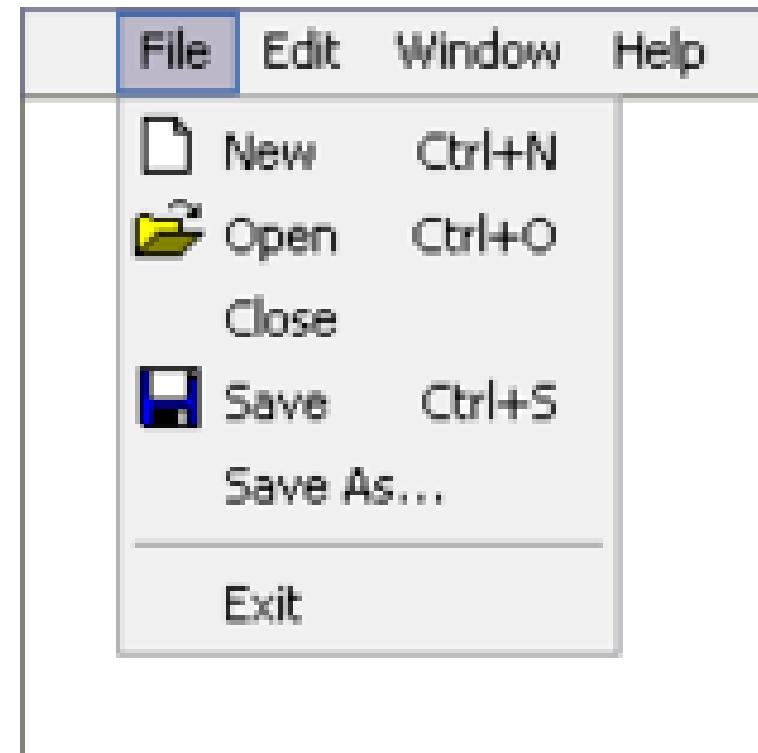
- Simplicity might require additional cues to infer meaning from (e.g., a Magnifying Glass  for searching when next to a search bar rather than zooming; text labels/tooltips)
- Styles for icon categories (e.g., business, utilities, entertainment/leisure)
- Follow existing guidelines and style guides



# Graphical User Interface: WIMP

## Menu

- Lists of options that can be scrolled through and selected from
- Similar behaviour as a restaurant menu
- Typically ordered from most to least frequently used, grouped by similarity



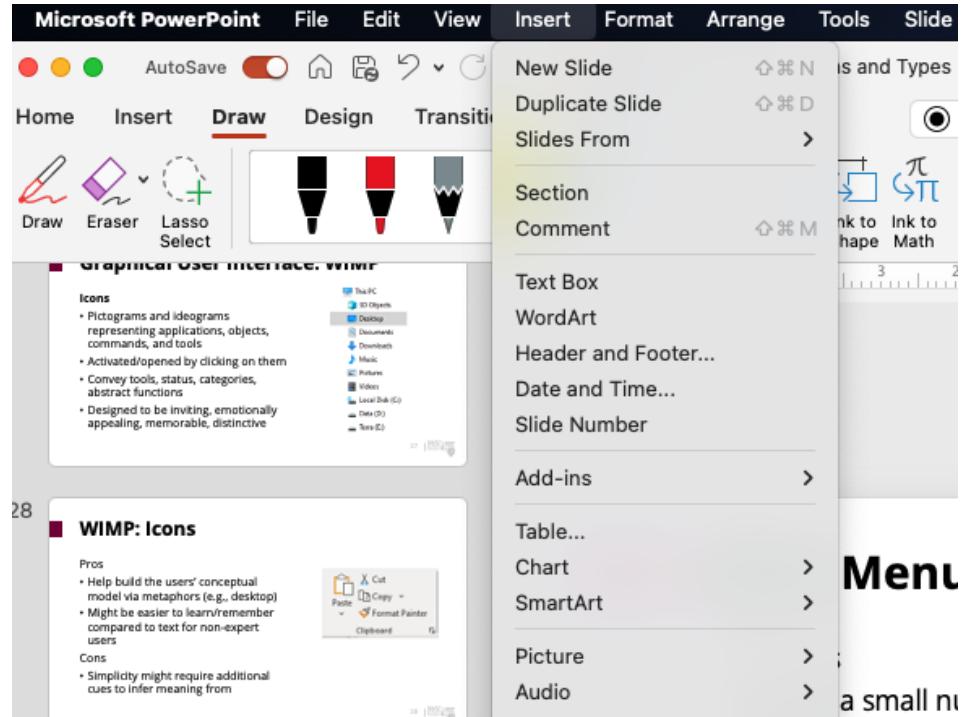
# WIMP: Menu

## Pros

- Displaying a small number of options at the same time
- Can provide context-sensitive options

## Cons

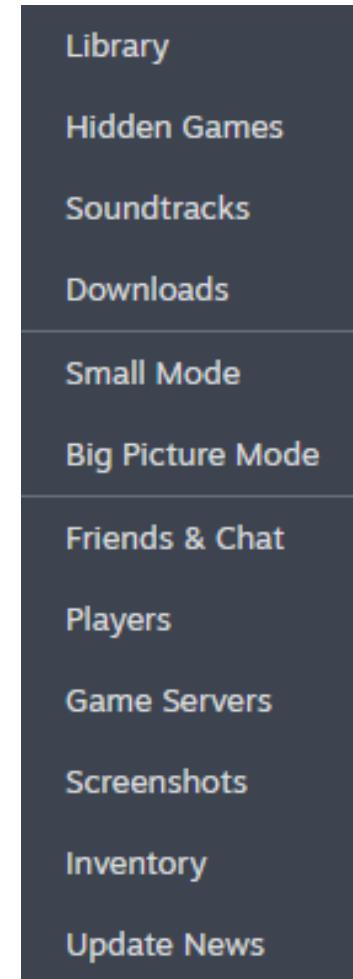
- Deeply nested menus tedious to navigate
- Can require precise cursor control



# WIMP: Menu

## Design Considerations

- Terms for menu options (e.g., length, distinguishable from other options)
- Separating options that could lead to errors (e.g., “Quit” and “Save” next to each other)
- How many options/nested menus to show at once



# Graphical User Interface: WIMP

## Pointer

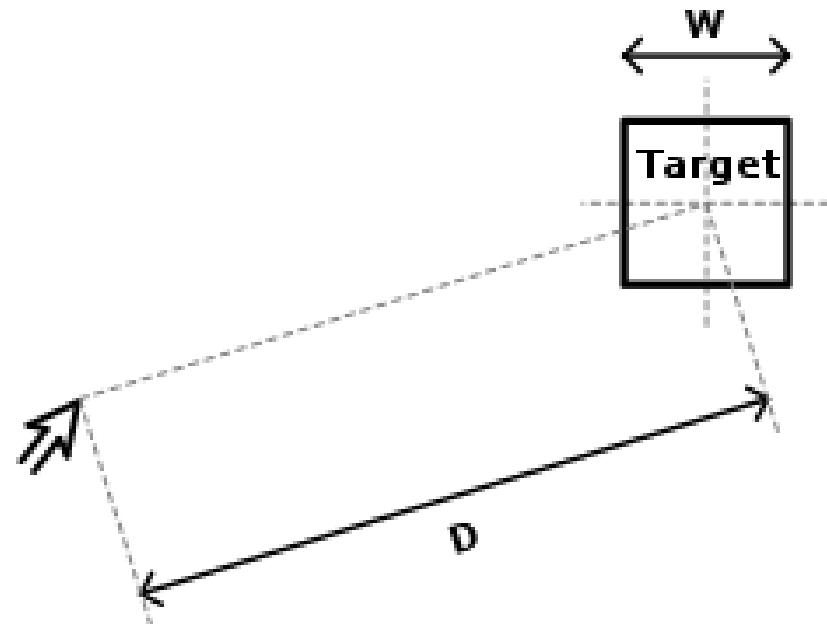
- A mouse-controlled cursor
- Entry point to windows, menus and icons on the screen
- Might also act as icons in some context-specific situations



# WIMP: Pointer

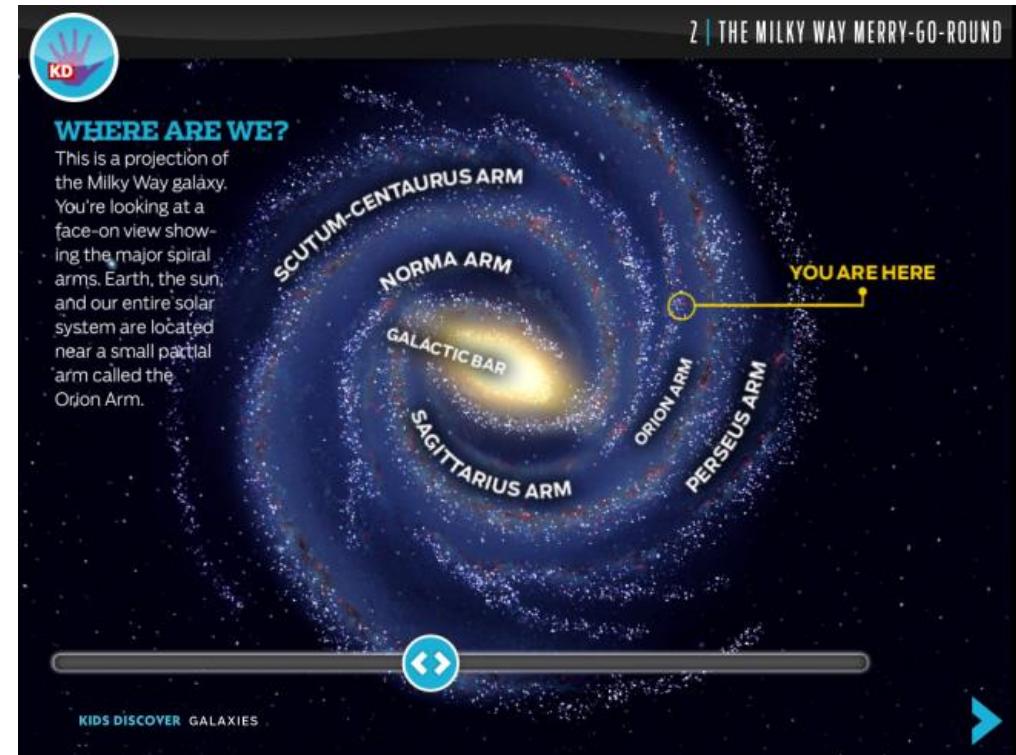
## Fitts' Law

- The amount of time required for a person to move a pointer (e.g., mouse cursor) to a target area is a function of the distance to the target divided by the size of the target
- Thus, the **longer the distance** and the **smaller** the target's **size, the longer it takes**



# Graphical User Interface: Multimedia

- Combines different media (e.g., graphics, text, video, sound, animations) to represent information in multiple ways
- Links elements with **interactivity** (e.g., interacting with an image causes a video to play)
- Easier to learn, better understanding of content, more engaging and pleasant

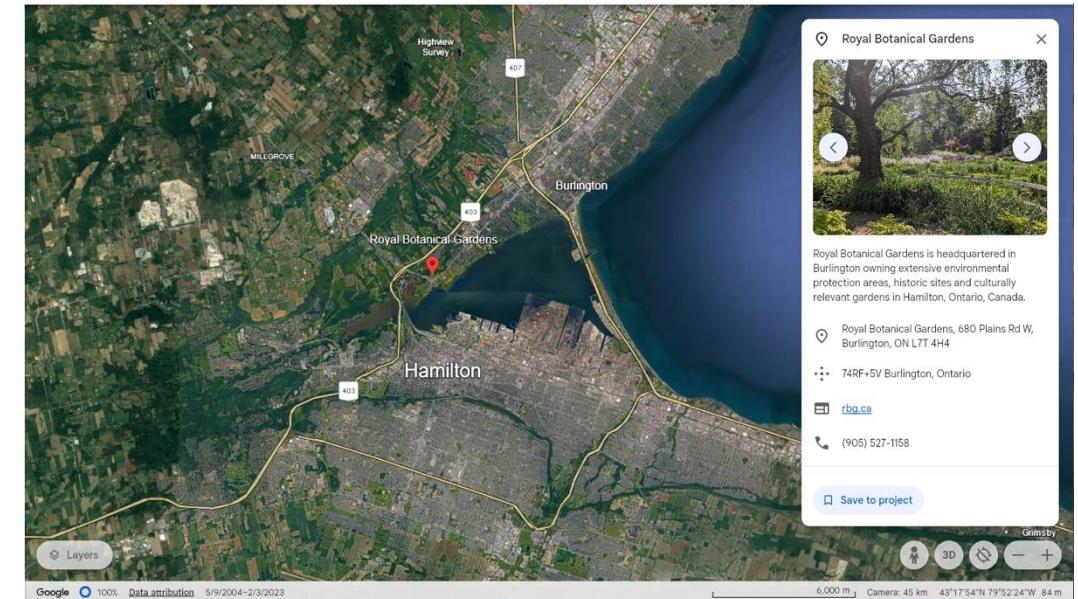


Kids Discover: Galaxies for iPad

# Graphical User Interface: Multimedia

## Design Considerations

- Encourage users to interact with different types of media (e.g., video vs. text)
  - Try interactive activities/tasks that they need the media to complete
  - Cross/Dynamic Linking: information in different windows change relative to each other



Google Earth

# Mobile Interface

- Useful for users that need:
  - Real-time data or information while **moving around**
  - Contextual information (e.g., from QR codes in the physical space)
- Often have some sensors (e.g., accelerometer, gyroscope, LiDAR)



# Mobile Interface

## Design Considerations

- **Small screen, limited control and navigation space**
- Size of “soft” controls (e.g., simulated buttons)
  - The average fingertip is 1–2 cm



# Interface Types: Overview

- **Command Line Interface**
- **Graphical User Interface (GUI)**
- **Mobile Interface**
  - Touch/Multitouch Interface
  - Gesture-based Interface
  - Tangible Interface
  - Voice User Interface
  - Conversational Interface
- Wearable Interface
- Augmented Reality Interface (AR)
- Virtual Reality Interface (VR)
- Robots/Drones

# Week 11 Overview

- **Monday**
  - Interface Implementations
- **Wednesday**
  - Interface Design Patterns
  - Interface Types
- **Friday**
  - Interface Types: continued
  - Interaction Types