



# Interaction Techniques

# Traditional Interaction Styles

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- ❑ Command language
- ❑ Menu selection
- ❑ Form fill-in
- ❑ Natural language (rarely used)
- ❑ Direct manipulation

# Command language

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- ❑ Type in specific commands
- ❑ “a means of expressing instructions to the computer directly using function keys, single characters, abbreviations or whole-word commands.” – Dix et al., 1998, p. 116
- ❑ advantages:
  - flexibility
  - supports user initiative
  - appeals to power users
  - potentially rapid for complex tasks
  - supports macro capabilities
- ❑ disadvantages:
  - requires substantial training and memorization
  - difficult to retain
  - poor error handling

# Menu selection

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- ❑ the computer displays a list of items from which the user selects
- ❑ categories must be meaningfully and logically grouped.
  - previous research has clearly demonstrated that participants are faster and more accurate with meaningful organization of menus – Shneiderman, 1998, p. 238

# Menu selection

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- types of menus
  - binary menu: choice of two options (i.e. on/off)
  - multiple-item menu: choice of more than two options
  - multiple-selection menu: can make multiple selections from the available options
  - pop-up menus: appears temporarily when mouse button clicked
  - cascading menus: a submenu opens when you select a choice from another menu
  - pull-down menus: a special type of pop-up menu that appears directly beneath the command you selected

# Menu selection

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- depth vs. breadth
  - Advantages/Disadvantages of short menus
  - Advantages/Disadvantages of fewer menus
  
- ~ 4-8 items per menu
- no more than 3-4 levels
  - breadth preferred over depth

# Menu selection

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- advantages:
  - reduces keystrokes
  - recognition vs. recall
  - accurate
  - structures decision making
- disadvantages:
  - requires screen space
  - complexity of several levels of menus
  - slows expert users
  - difficult to find appropriate terminology

# Form fill-in

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- List and combo boxes
  - coded fields
    - telephone numbers, SIN numbers, times, dates, dollar amounts
  
- advantages:
  - simplifies data entry
  - fast for specific types of data
  - all information is visible
  - modest training
  
- disadvantages:
  - consumes screen space
  - requires typing skills

# Natural language

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- Interact through users' own natural language
- advantages:
  - relieves burden of learning syntax
- disadvantages:
  - may require more keystrokes
  - requires clarification dialog
  - unpredictable
  - may not show context

# Natural language

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- The man hit the boy with the stick

# Direct manipulation

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- Create visual representations of objects and actions, then with pointing, zooming and panning the user can rapidly perform operations
- advantages:
  - visually presents the task
  - easy to learn
  - easy to retain
  - errors can be avoided
  - encourages exploration
  - high subjective satisfaction
- disadvantages:
  - requires graphics display/pointing devices
  - more programming effort
  - hard to record history or write macros
  - some tasks difficult

# Why do we need new interaction techniques?

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# Novel Interaction Styles

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- Improvements to traditional desktop widgets
  - Fisheye Menus
  
- New interaction styles for traditional desktop environments
  - ToolGlass & Magic Lenses {<http://www.billbuxton.com/96sweeps.swf>}
  - Novel Interaction Techniques for Overlapping Windows
  
- New interactions styles for non-desktop environments
  - Tablets: Scribboli  
{<http://research.microsoft.com/users/kenh/papers/Scribboli.wmv>}
  - Large Display – FlowMenu {Jen Comeau}
  - Various size displays: Radial Scroll Tool  
{<http://eprints.ecs.soton.ac.uk/9247/02/graham.mov>}
  
- New techniques for novel input devices
  - Digital Tape Drawing {<http://www.billbuxton.com/tape.swf>}

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