

Interaction styles

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Interaction styles

Conversational

Command language
Dialog imposed by the system

```
% date  
Fri February 11  
%
```

Menus, forms

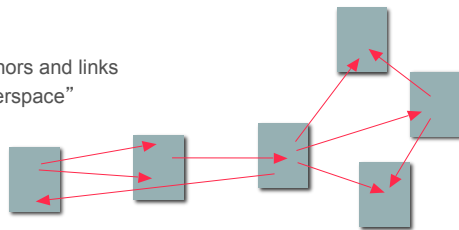
The system guides the user
Dialog controlled by the system

```
Name : ..... 1 - search  
Surname : ..... 2 - create  
CPR Number : ..... 3 - delete
```

Interaction styles

Navigation

Nodes, anchors and links
"lost in hyperspace"



Direct manipulation

Physical, "direct" actions on (representations of) the objects
Inspires all current "first person" interfaces

Direct manipulation

Shneiderman (1983)

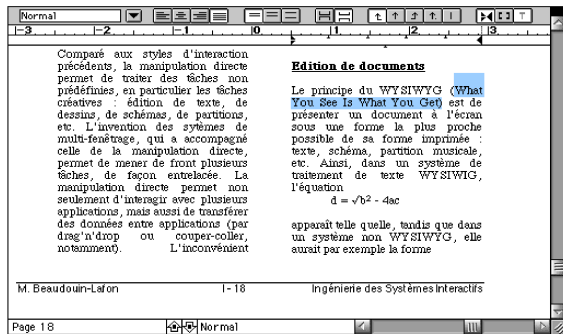
Four principles

1. Continuous representation of the objects of interest
2. Physical actions rather than complex syntax
3. Quick, incremental, reversible operations whose effect on the objects of interest is immediately visible
4. Layered approach to facilitate learning

Direct manipulation

Document editing

Interaction controlled by the user



WYSIWYG

What You See Is What You Get

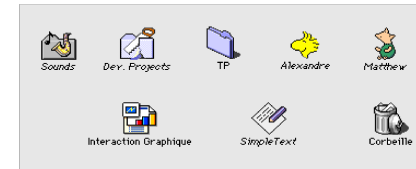
Direct manipulation

Iconic interaction

Generic interface

Metaphorical approach

Drag-and-drop



WIMP interfaces: the current standard

Presentation

Windows

Icons (and other graphical representations)

Interaction

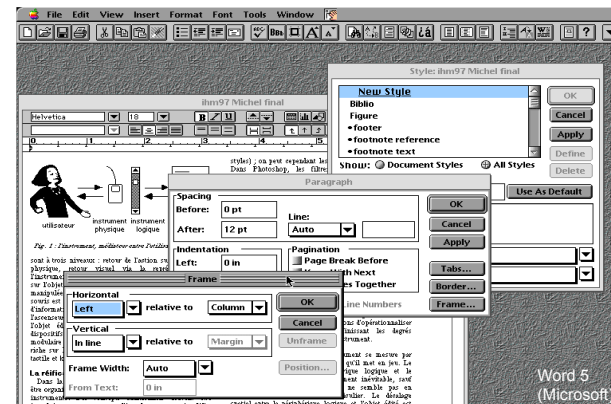
Menus,

Dialog boxes, Input fields, Scrollbars, etc.

Input

Pointing, Selection, Gestures

WIMP interfaces



Interaction styles: gesture-based interaction

Pen-based



PDA (Palm Zire)



TabletPC (HP)



Whiteboard(Smart)

Touch-based



PLATO (Buxton, 1972)



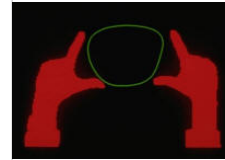
Multitouch (Jeff Han)



iPad (Apple)

Interaction styles: gesture-based interaction

3D gestures



VideoPlace (Krueger, 1983)



Charade (Baudel, 1993)



Kinect (Microsoft)

Recognition vs. Recall

Recognition-based interface:

Provides information (feed-forward) about available commands, so the user can recognize them

Example : menus, icons, toolbars, ...

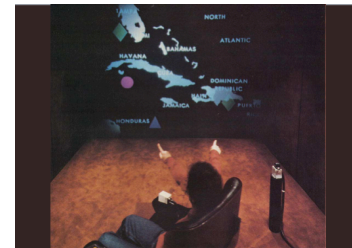
Recall-based interface:

Relies on the user having learned and memorized the commands and/or how to input them

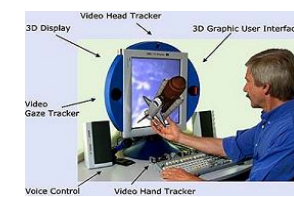
Example : gesture-based interface, language-based interface (speech, natural language, command language)

Interaction styles: multimodal interaction

Combine speech + gesture



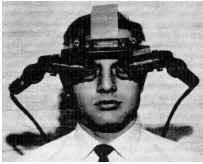
Put-that-there (Bolt, 1980)



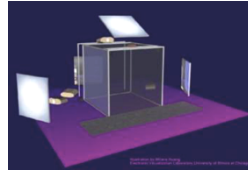
Minority Report (movie)

Interaction styles: Virtual reality

Immersion of the user



Sutherland (1968)



HTC Vive



CAVE

Interaction styles: mixed and augmented reality

Augmented reality (later renamed Mixed reality):

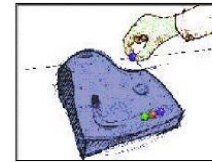
Augment physical object with computational capabilities

Tangible interaction:

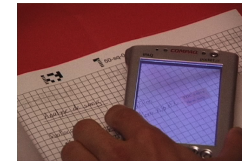
Use physical objects for interaction



Digital Desk
Pierre Wellner



Marble answering machine
Durrell Bishop



A-book
Wendy Mackay

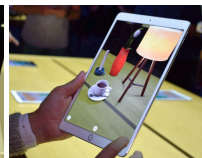
Augmented Reality



Wearable group / Thad Starner (1995, MIT)



Holodesk (2012, Microsoft)



ARKit (2017, Apple)



Google Glass (2010)



Hololens (2015, Microsoft)

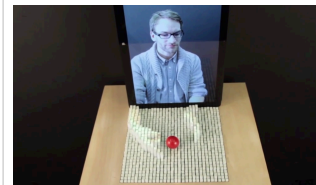
Embodied and Physical interaction



RomAlive (2014, Microsoft)






Skinput (2016, CMU)





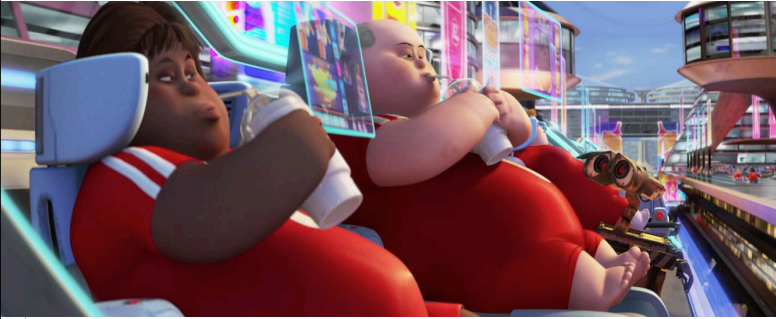
InForm (2013, MIT)



Zooids (2017, Inria)

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| What next? |  |
| Brain-computer interfaces? | |
| Emotional agents |  |
| Robots |  |
| Your idea? | |

| | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| | |
| What future do you want? | |
|  |  |
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| | |
| What future do you want? | |
|  | |
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