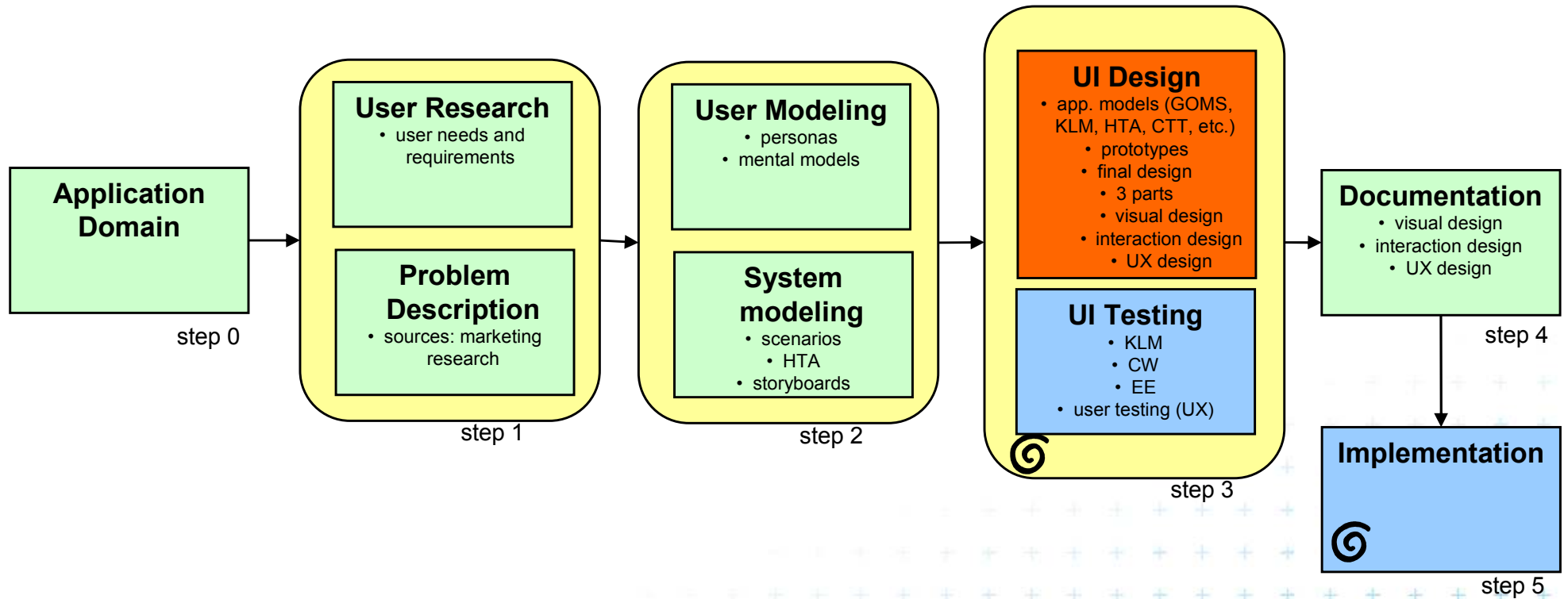


DCGI

DEPARTMENT OF COMPUTER GRAPHICS AND INTERACTION

NUR - Interaction styles

Big Picture

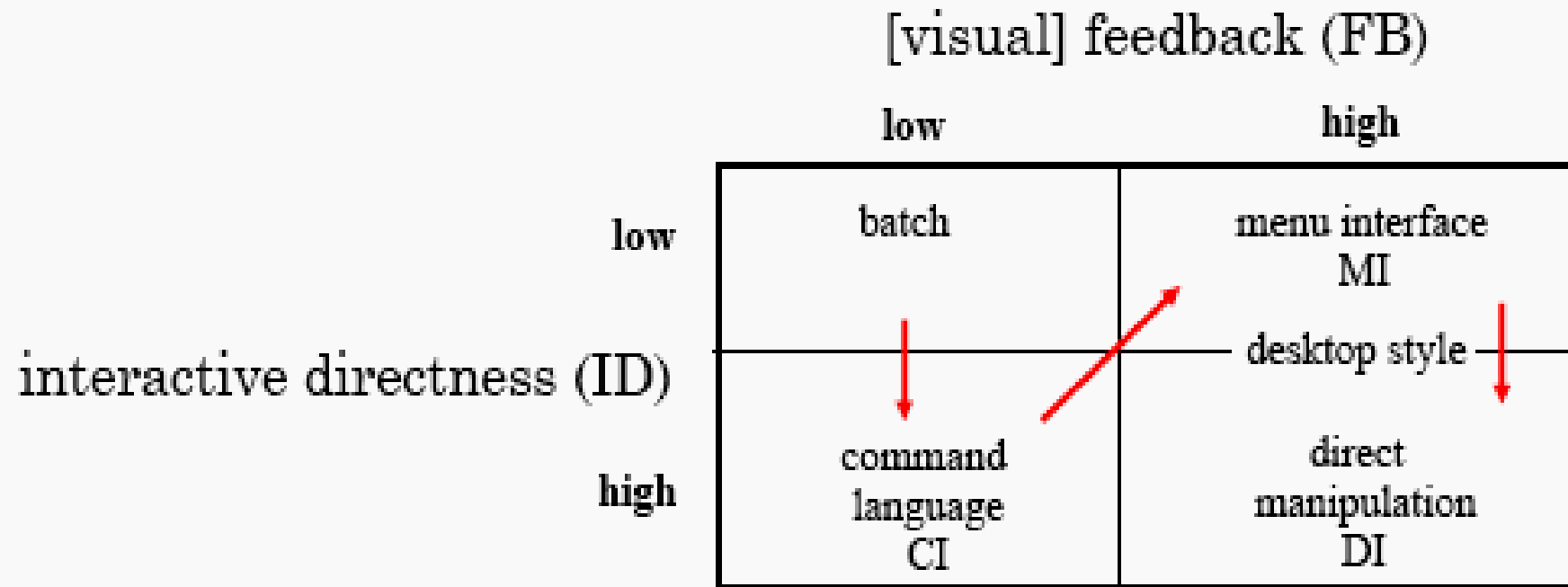


Interaction styles

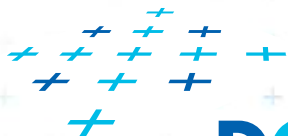
- Direct manipulation (games)
- Navigation: Menu, links (web)
- Form fill-in (web)
- Command Language (unix)
- Natural language
- ...



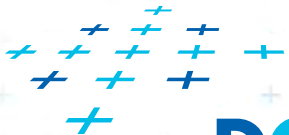
Classification of interaction styles



Rautenberg, M. (1998). About a method to measure the ergonomic quality of user interfaces in a task independent way. In: Technical proceedings of the workshop on emerging technologies in human engineering testing and evaluation (T.P. Enderwick & J. Geddis, eds., pp. 128-144), unclassified Report No. AC/243(Panel 8)TP/17, NATO, Brussels.



Command language



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NUR - Interaction styles

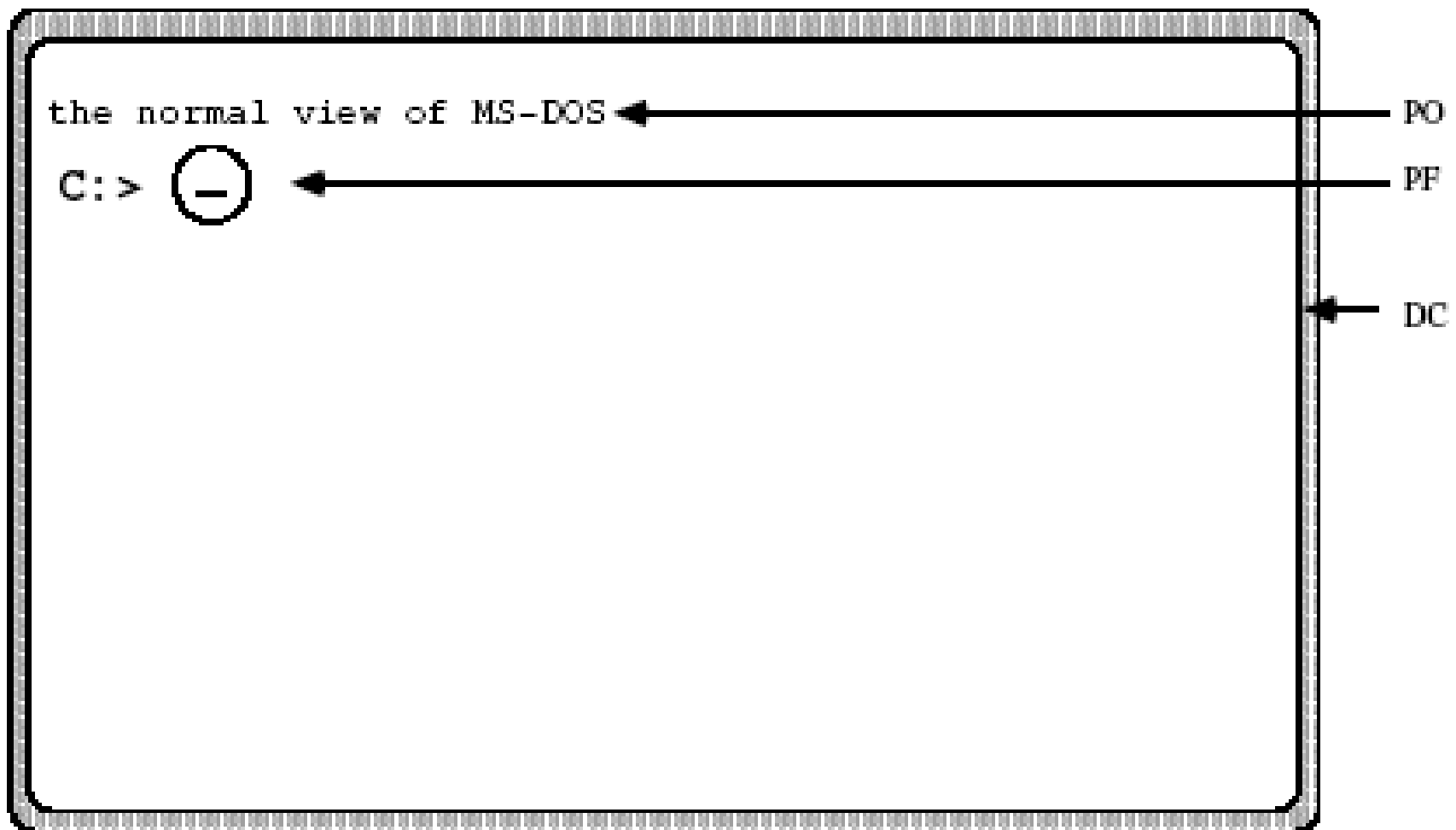
(5)



Command language

- Abbreviations of commands - rules
- CL was in fact the first method of communication between users and computers (in wider extent) (DOS, Shell, terminal system for air tickets reservation, etc....)





[PO: perceivable object; PF: perceivable function point; DC: dialogue context]

(source [Rautenberg, 1995](#))

Command name abbreviation design (2)

Name	Abbreviations	
	Poor:	Improved:
Move forward	MovF	MovF
Move backward	Mvb	MovB
Insert	I	Ins
Delete	DI	Del
Replace	Repl	Rep
Search	Srch	Sea
Delete	X	Del
Send	Sn	Sen
Print	Prt	Pri
Search	Srch	Sea
Send	Sn	Sen
Find	Fi	Fin
Choose	Ch	Cho

[Source: Mayhew (1992) chap 7]



Description of command syntax

- BNF
- Syntactic diagram
- Finite state automaton (transition diagrams ...)
- Verbal description



Example of BNF description

<simple> ::= <prompt> <command> [<command_separator> <command>]*

<command> ::= <command_name> ["<argument> ["<parameter> "]"* "]"*]

<argument> ::= <letter> [<letter>* | <digit>*]

<parameter> ::= <letter> [<letter>* | <digit>*]

<prompt> ::= (SIMPLE:)

<command_separator> ::= ";"

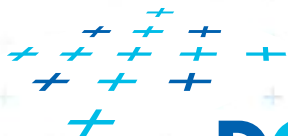
**<command_name> ::= (CANCEL | CA) | (UNDO | UN) | (WRITE | WR) | (COPY | CO)
| (DELETE | DE)**

Např.:

WRITE *filename* [*length*]

COPY *input-filename* [*copies*] *output-filename*

...



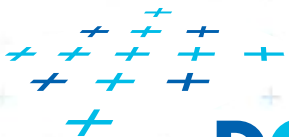
Command Language

Advantages

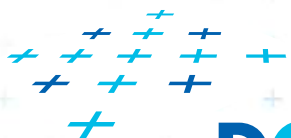
- Flexibility
- Loved by advanced users
- Supports user initiative
- Macros

Disadvantages

- Poor error handling
- Requires training



Menu



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NUR - Interaction styles

(12)



Menu

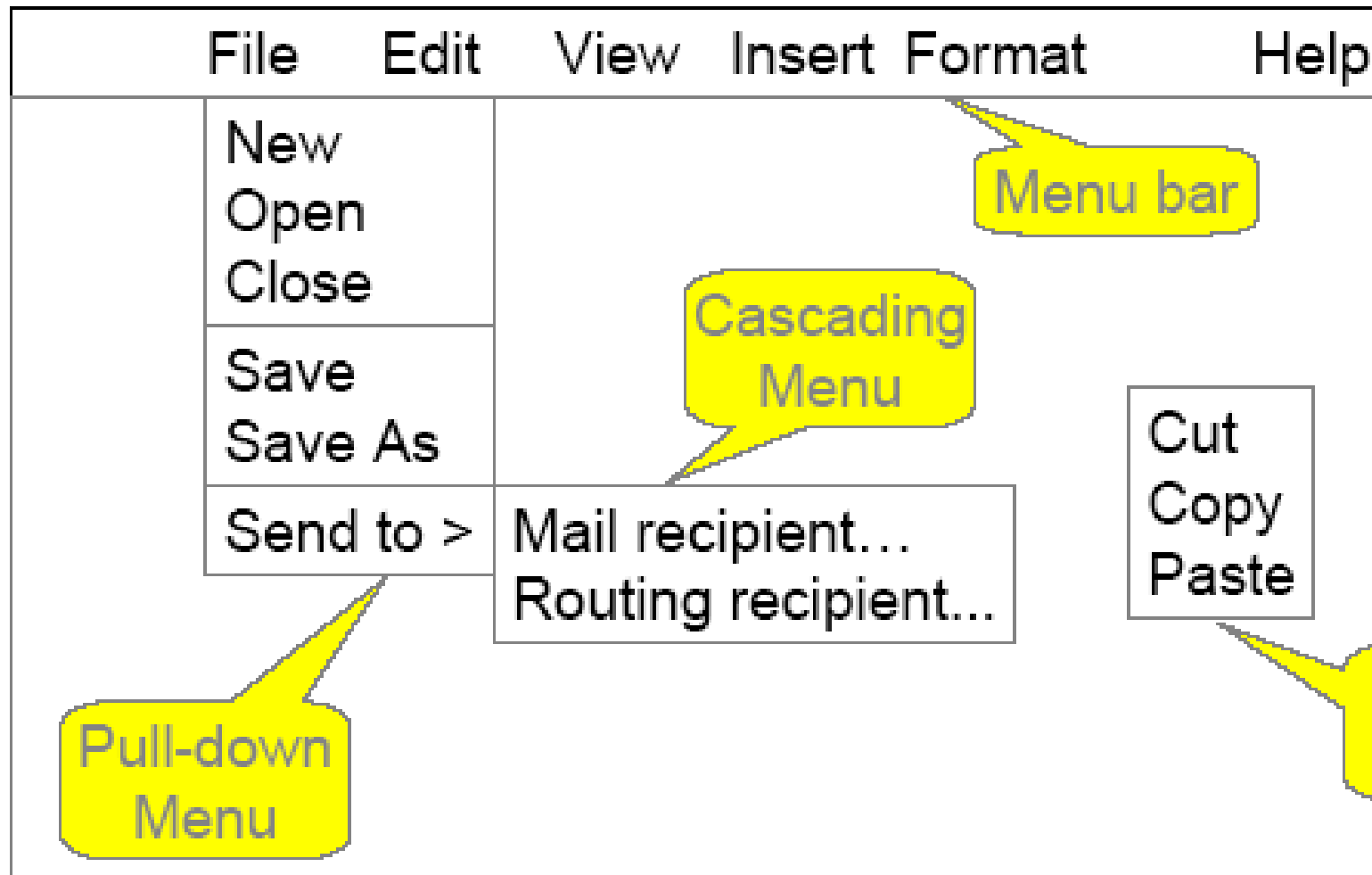
TYPES:

- Pop up
- Pull down
- Cascade

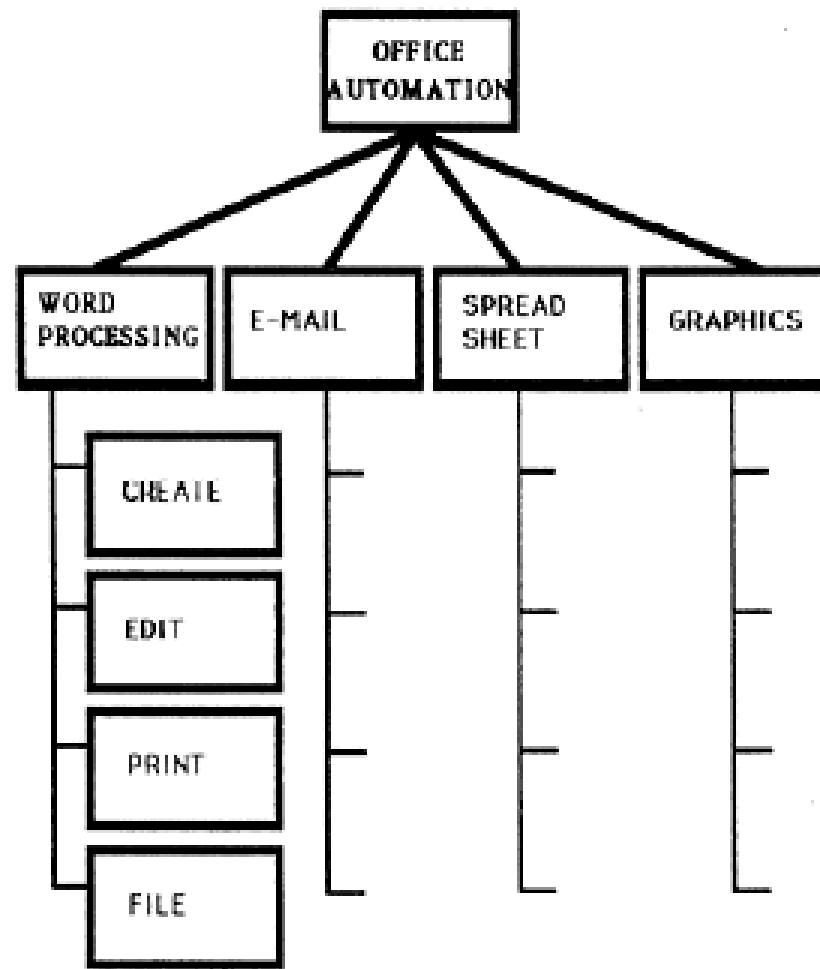
Advantage: it is not necessary to remember form of the command

Disadvantage: takes too much space on the screen (e.g. country selection)



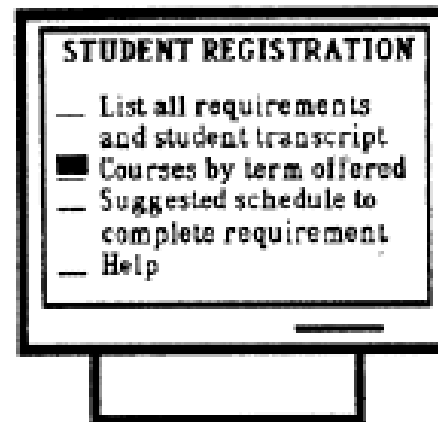


Menu structure

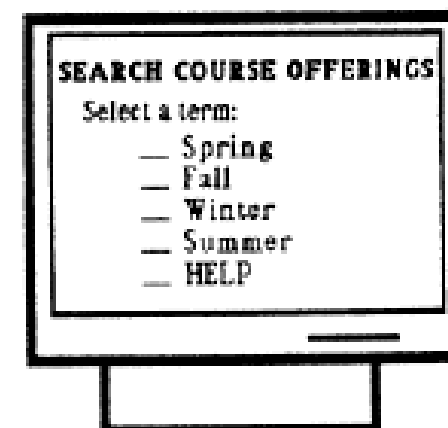
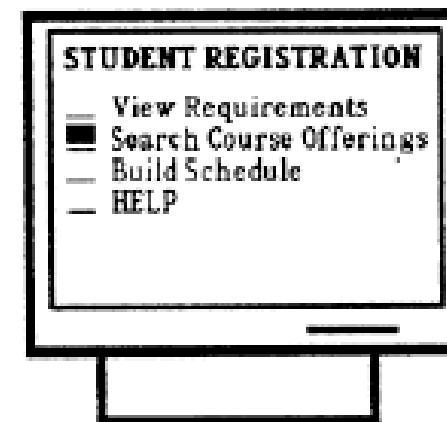


Menu items should be brief, consistent in grammatical style and placement, and matched with corresponding menu titles.

POOR:

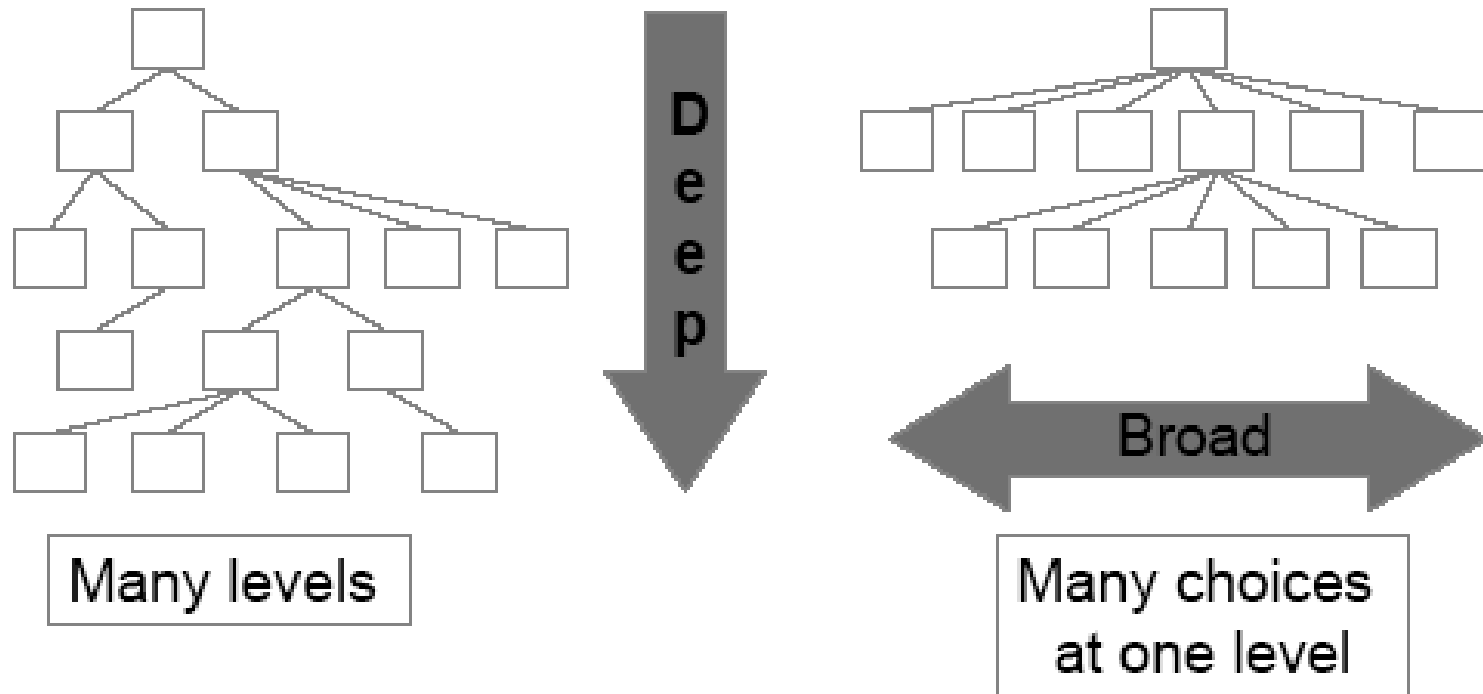


IMPROVED:

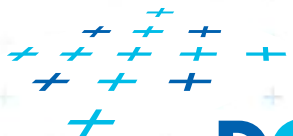


Menu structure

Depth vs. Breadth



What is better?



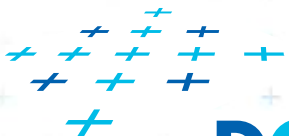
Menu

Advantages

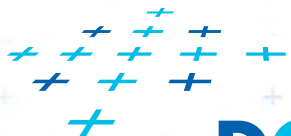
- Quick learning
- Limited input from keyboard
- Structured decision processes
- Simple error handling

Disadvantages

- Coexistence of many menus
- Can slow down experienced users
- Takes too much space on the screen



Form filling



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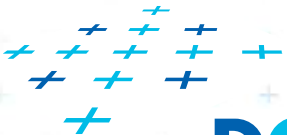
NUR - Interaction styles

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Form fill-in

NEW BOOK			
Title	<input type="text"/>	ISBN	<input type="text"/>
Author	<input type="text"/>	Price	<input type="text"/>
Publisher	<input type="text"/>	Publication date	<input type="text"/>
Edition	<input type="text"/>	Number of copies	<input type="text"/>
Classification	<input type="text"/>	Loan status	<input type="text"/>
Date of purchase	<input type="text"/>	Order status	<input type="text"/>



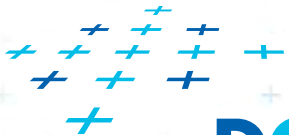
Form fill-in

Advantages

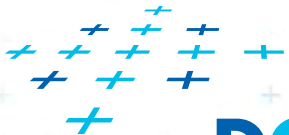
- Simple data input
- No extensive training
- Gives good control over data input (checking letters, digits etc..)

Disadvantage

- It takes too much space on the screen



Direct Manipulation



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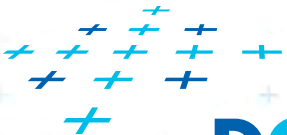
NUR - Interaction styles

(22)

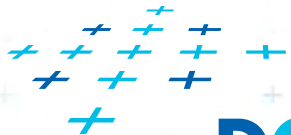
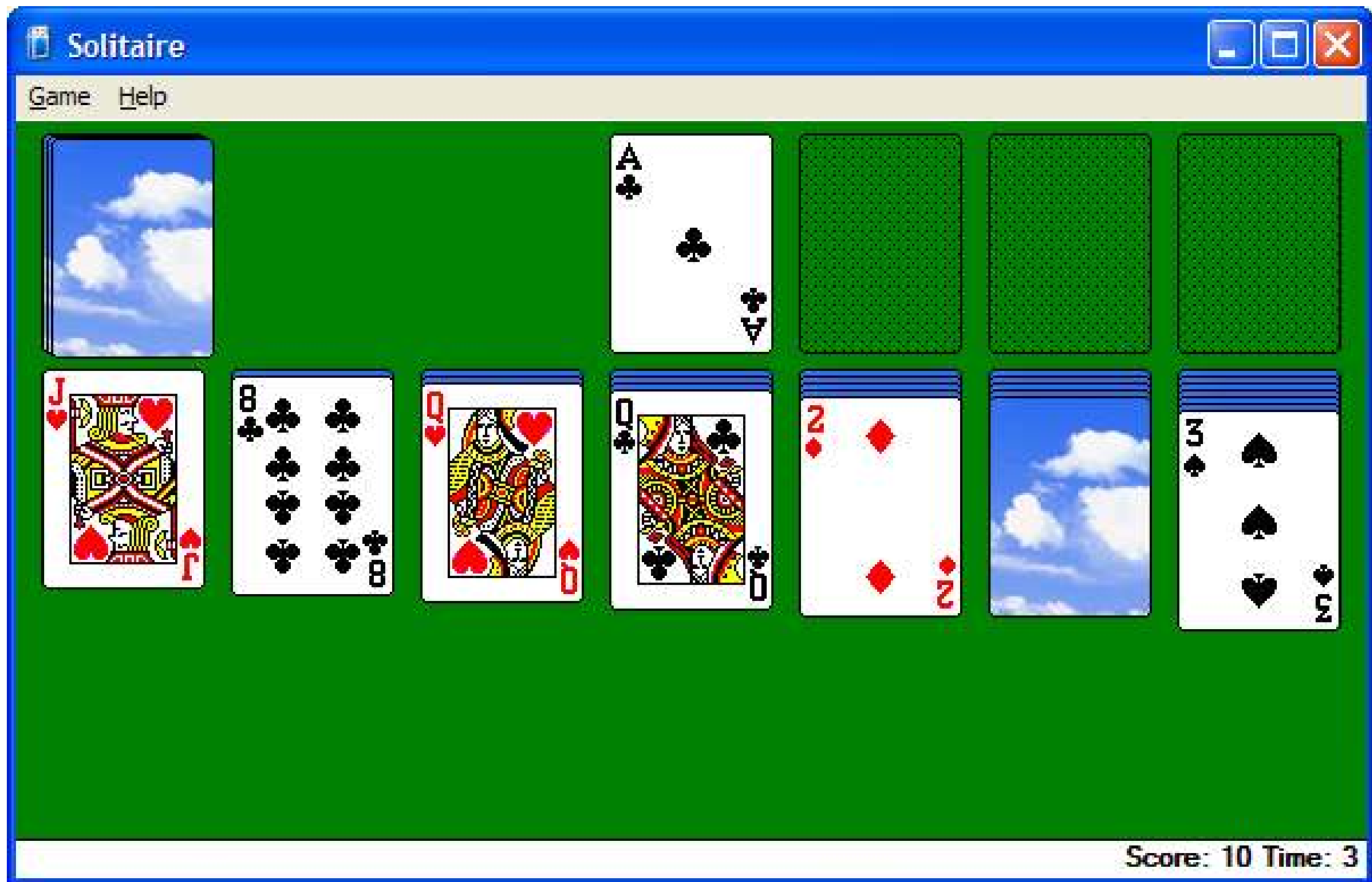


Direct Manipulation

- **Direct manipulation**
 - UI gives feeling like the user works with real objects
 - Having feeling of the “real work”
- **Main characteristics**
 - Objects of interest are visible
 - Quick, reversible, incremental actions
 - Manipulation by means of pointing and cursor movement (e.g)
 - Immediate feedback
- **Mostly based on metaphors - e.g. house = database**



Direct Manipulation



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NUR - Interaction styles

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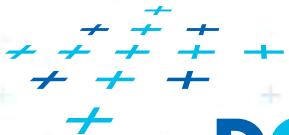
Direct Manipulation

Advantages

- Visual presentation of the task concept
- Easy learning
- Easy to remember (actions performed)
- Error proof
- Supports investigative spirit of the user
- High user satisfaction

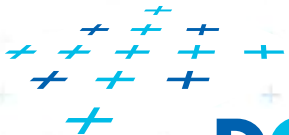
Disadvantage

- Extensive implementation requirements

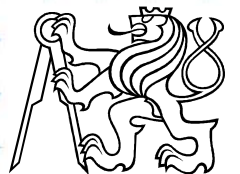


INPUT: POINTING DEVICES

WHICH ARE THE BEST ONES?



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Pros and Cons of Pointing Devices

	Cursor keys	Mouse	Joy stick	Trackball	Touch screen	Touch pad
Speed	Slow	Fast	Medium	Medium	Fast	medium
Accuracy	High	Medium	Medium	High	Low	Medium
Speed control	Some	Yes	Some	Yes	Yes	Yes
Continuous movement	No	Yes	Soe	Yes	Yes	Yes
Fatigue	Low	Medium	Medium	Medium	High	Medium
Directness	Direction	Direction, distance, speed	Direction	Direction, speed	Direction, distance, speed	Direction, distance, speed
Best uses	Cursor	Cursor, point, select, draw, drag	Cursor, point, select, track, drag	Cursor, point, select, track	Point, select	Point, select



D.CV.

- Uvažujte nějakou známou aplikaci s daným stylem interakce.
- Pokuste se tento styl interakce nahradit jiným stylem a pokuste se oba případy porovnat
- Takový případ může např. nastat v případě modifikace UI pro postižené uživatele

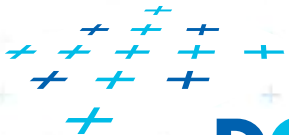


New interaction styles



New interaction styles

- Speech based UI
- Gestures (Wii etc...) – computer vision, gyro
- NVVI
- Haptic devices, force feedback (Phantom etc..)
- Bio signals
- Eyetracking
- VR (dataglove, data suit ,...)



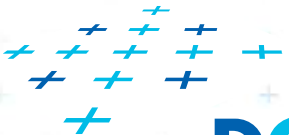
Natural language

Advantages

- No training in artificial language syntax
- Natural feeling in various environments (phone etc.)

Disadvantages

- Usually requires introductory dialogue
- Sometimes the context is not obvious
- Sometimes the dialogue is unpredictable

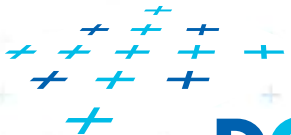
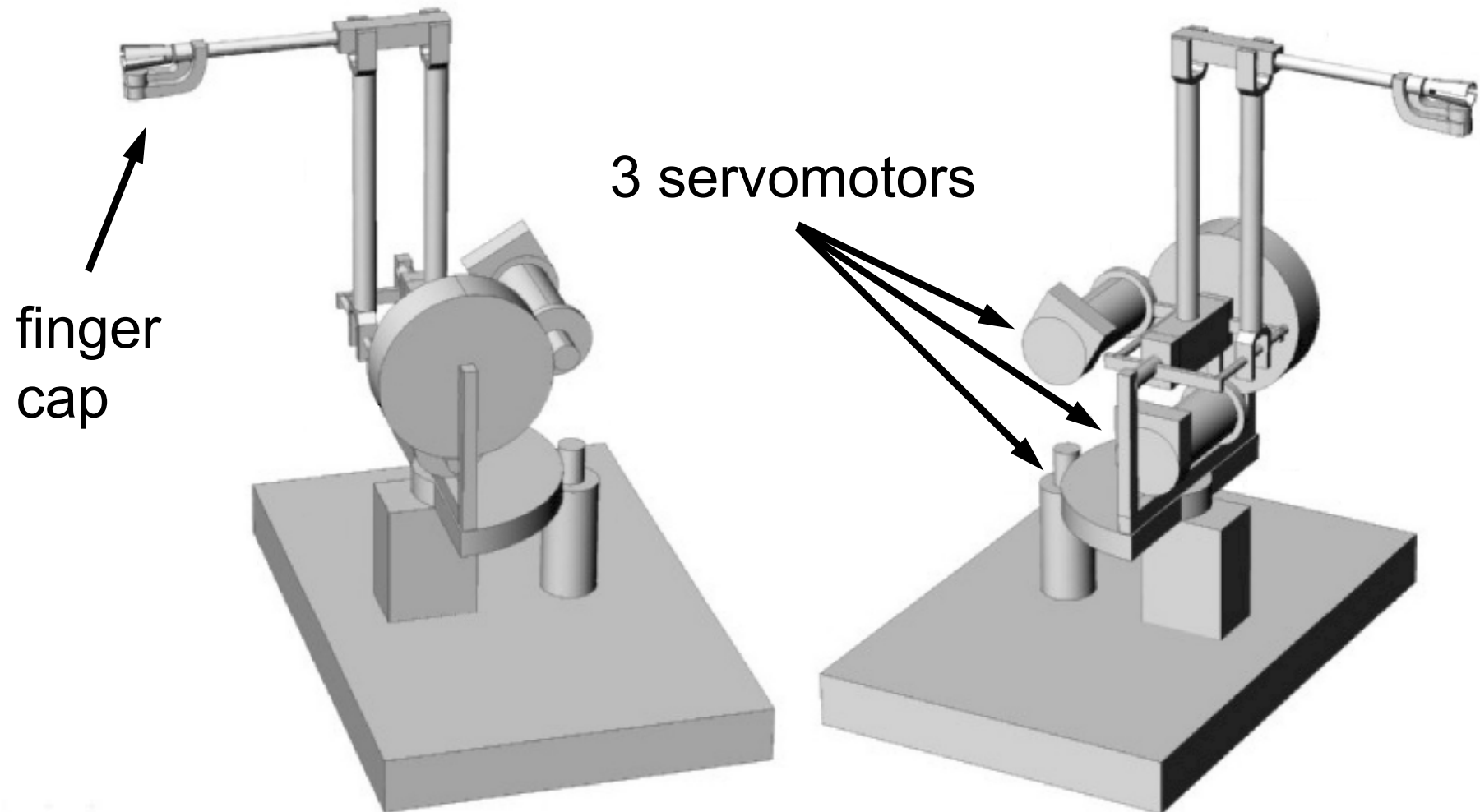


Eye tracking

- Precision 1-2 degrees
- Applications: motoric handicapped users



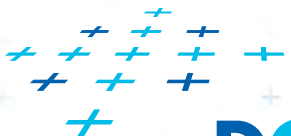
Phantom



Simple data glove (*Matte!*)



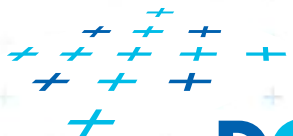
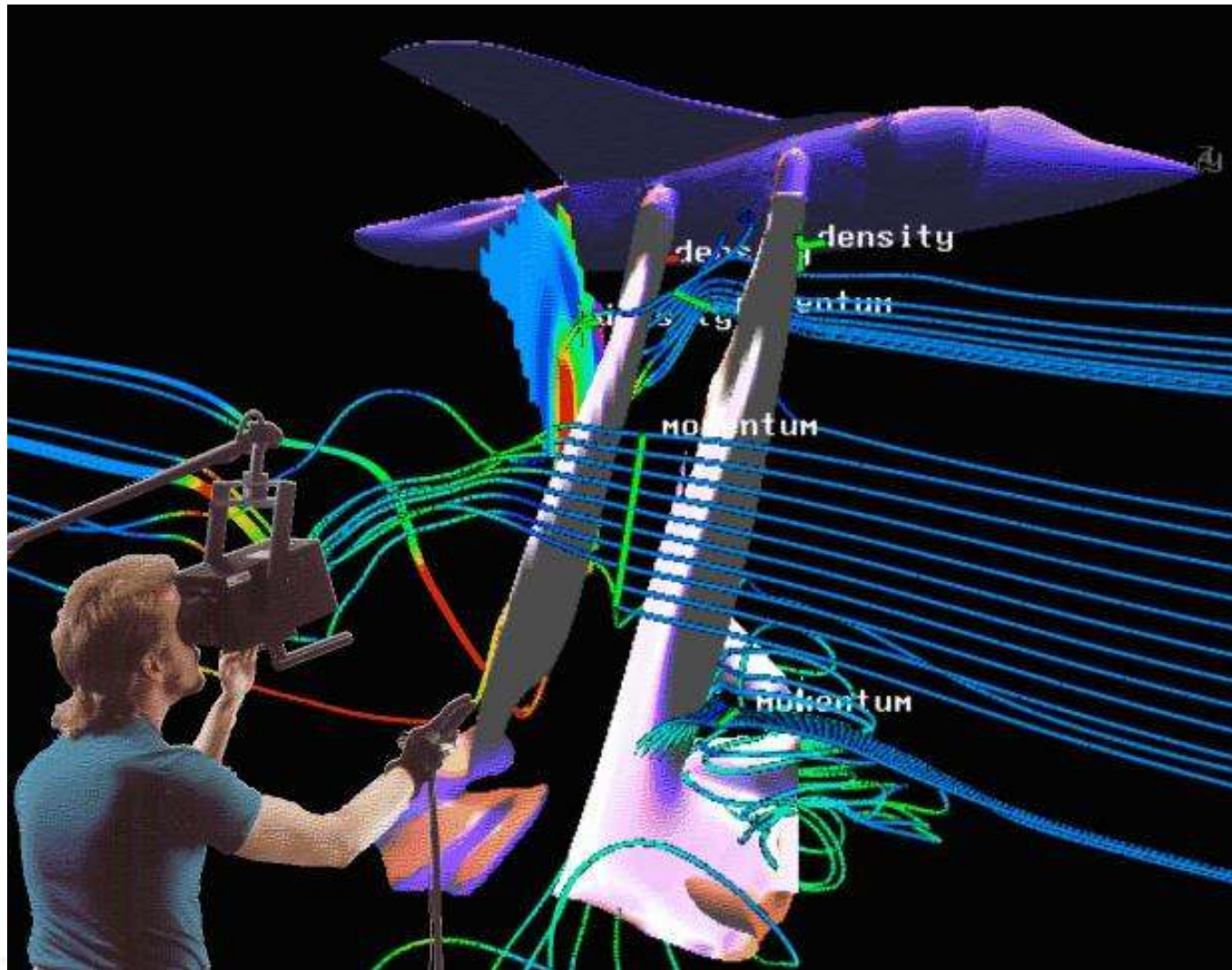
Power
Glove



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NASA Virtual Wind Tunnel



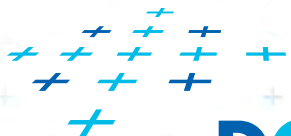
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NUR - Interaction styles

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Thank for your attention



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