

The Computer

- Input devices
- Output devices
- VR
- Memory
- Processing

§4. The Computer

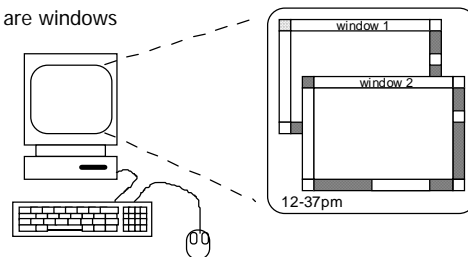
What is a UI?

- Input devices?
- Output devices?
- Controls?

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A 'typical' computer system

- screen, or monitor, on which there are windows
- keyboard
- mouse/trackpad
- variations
 - desktop
 - laptop
 - PDA



the devices dictate the styles of interaction that the system supports
If we use different devices, then the interface will support a different style of interaction

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How many ...

- computers in your house?
 - hands up, ...
 - ... none, 1, 2, 3, more!!
- computers in your pockets?

are you thinking ...
... PC, laptop, PDA ??

§4. The Computer

How many computers ...

in your house?

- PC
- TV, VCR, DVD, HiFi, cable/satellite TV
- microwave, cooker, washing machine
- refrigerator
- security system

in your pockets?

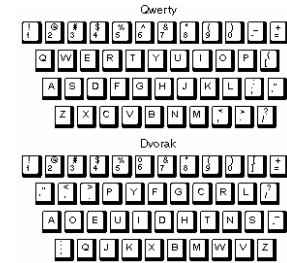
- PDA
- phone, camera
- smart card, card with magnetic strip?
- electronic car key
- USB memory

try your pockets and bags

§4. The Computer

Text entry devices

- Keyboards
- Chord keyboards
- Phone pad and T9 entry
- Handwriting recognition
- Speech recognition



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Positioning, pointing and drawing

- The mouse
- Touchpad
- Trackball and thumbwheel
- Joystick and keyboard nipple
- Touch-sensitive screens
- Stylus and light pen
- Digitizing tablet
- Eyegaze
- Cursor keys and discrete positioning
- Spaceball



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Discrete positioning controls

- in phones, TV controls etc.
 - cursor pads or mini-joysticks
 - discrete left-right, up-down
 - mainly for menu selection



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Display devices

- Bitmap displays
- CRT and LCD
- Large and situated displays



§4. The Computer



Devices for VR and 3D interaction

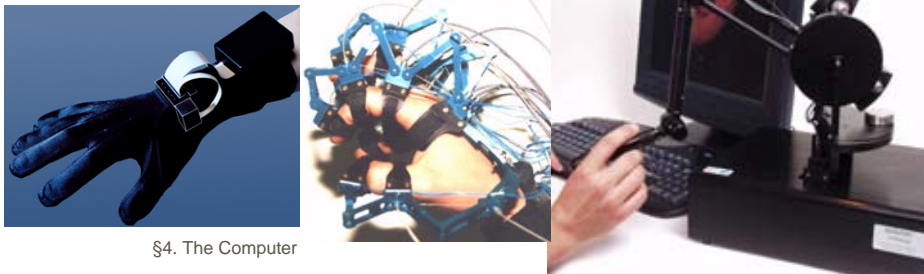
- Positioning in 3D space
 - 3D mouse, dataglove, VR helmet, whole-body tracking
- 3D displays
 - Seeing in 3D, VR motion sickness, simulators and VR caves



§4. The Computer

Physical controls, sensors and special devices

- Special displays (LEDs, gauges, etc)
- Sound output
- Touch, feel and smell
- Physical controls
- Environment and bio-sensing



§4. The Computer

Paper: printing and scanning

- Printing
- Fonts and page description
 - Fixed vs variable and serif vs sans-serif
 - courier tahoma times roman arial
- Screen and page (WYSIWYG)
- Scanners and optical character recognition

§4. The Computer


Memory



- RAM and short term memory
- Disks and long term memory
- Flash
- Understanding speed and capacity
- Compression
- Storage formats and standards
 - ASCII, UNICODE, RTF, SGML
- Methods of access
 - Index, Soundex, free text retrieval

§4. The Computer

Processing and networks



- Effects of finite processor speed
 - Interaction and reaction
 - E.g., buffered events
- Limitations on interactive performance
 - Computation bound
 - Storage channel bound
 - Graphics bound
- Networked computing
- Internet – always connected?
 - Social consequences

§4. The Computer

Moore's law



- computers get faster and faster!
- 1965 ...
 - Gordon Moore, co-founder of Intel, noticed a pattern
 - processor speed doubles every 18 months
 - PC ... 1987: 1.5 Mhz, 2002: 1.5 GHz
- similar pattern for memory
 - but doubles every 12 months!!
 - hard disk ... 1991: 20Mbyte : 2002: 30 Gbyte
- baby born today
 - record all sound and vision
 - by 70 all life's memories stored in a grain of dust!

§4. The Computer

[/e3/online/moores-law/](#)