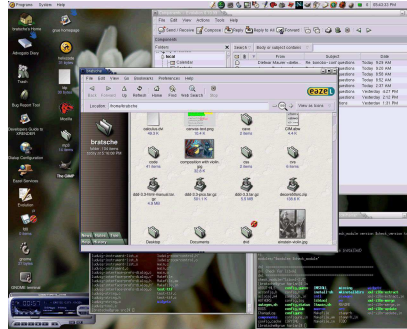
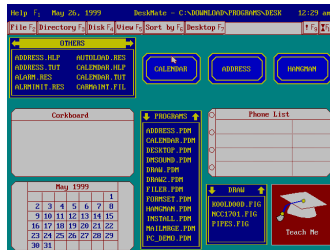


- Graphical User Interfaces
 - windows/menus/controls
 - mouse/keyboard



1

- Pre-historic times
 - Douglas Engelbart, Stanford, **1962 - 1968**
 - 1st “mouse”: wooden box on wheels
 - Ivan Sutherland, MIT, **1963**
 - Sketchpad



2

Sketchpad: Ivan Sutherland, MIT, 1963

- Create engineering drawings (2000 : 1 scale)
- Ran on experimental “online” computer
- Physically huge due to 320 KB memory
- CRT, light pen
- First GUI
- New concepts: rubber-banding, zoom in/out, sketching perfect lines, corners, and joints.

3



4

- Demo: mouse, text editing, copy/paste, etc.
RealVideo clip:

<http://sloan.stanford.edu/mousesite/1968Demo.html>



5

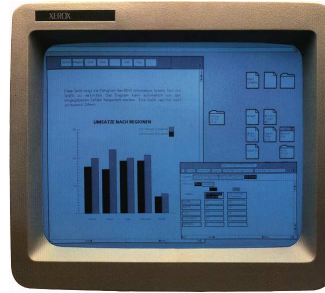
Features:

- 8½ x 11 Bit-mapped display (WYSIWYG)
- Windows, icons, menus, pointer (WIMP)
- Ethernet...



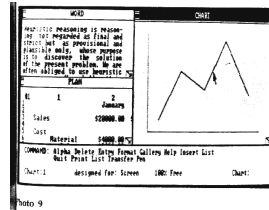
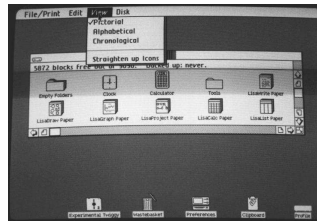
6

- 1979: Jobs and Wozniak visit PARC
- June 1981: Xerox Star
 - Double-clickable icons
 - Overlapping windows
 - Dialog boxes
 - 1024x768 monochrome display
 - High price



7

- January 1983
 - Apple's Lisa
 - pull down menus
 - menu bars
 - Microsoft announces Windows
 - supposedly has overlapping/resizable windows



8

Introduced: January 1983

Released: June 1983

Price: US \$9,995

How many? 100,000 in two years

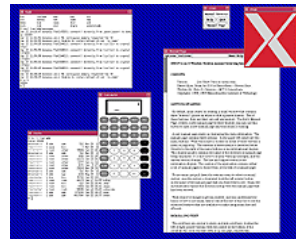
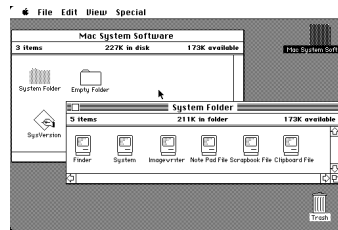
CPU: Motorola 68000, 5 MHz

RAM: 1 Meg

Display: 12" monochrome, 720 X 364

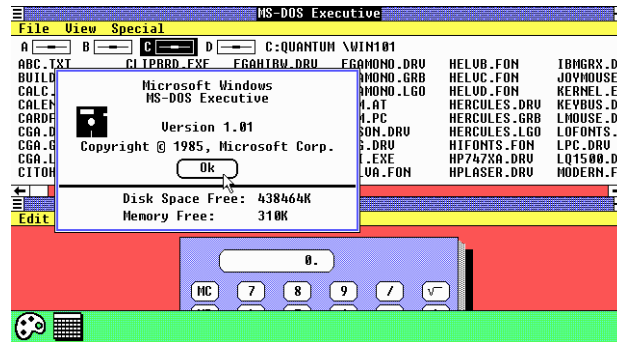
9

- January 1984
 - Apple's Macintosh
 - 128Kb memory
 - \$2,495.00.
- June 1984
 - X windows (MIT)
 - Customizable



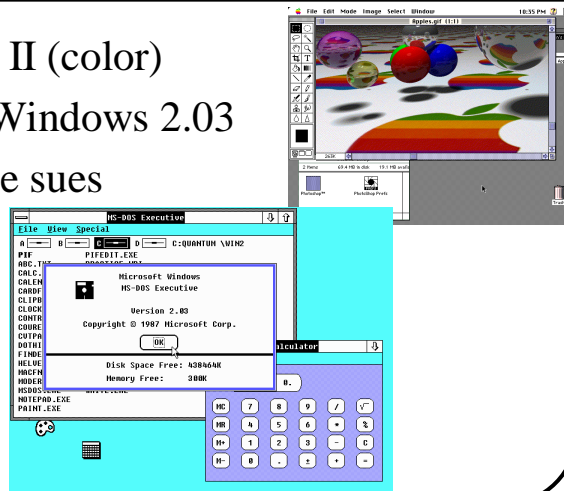
10

- Windows can be tiled, not overlapped
- Iconized programs on the bottom



11

- Apple Mac II (color)
- Microsoft Windows 2.03
- 1988: Apple sues Microsoft and HP



12

- Today: faster, cheaper, higher-resolution, so cool you “want to lick it.”
- Same WIMPy setup
- (Amazing revolution in 3D graphics HW)

- Design for what the user knows
 - artists, businessmen, kids

```

*** STOP: 0x0000001F (0xC0000005,0x8016A950,0x00000001,0x00000086)
KMODE_EXCEPTION_NOT_HANDLED*** Address 8016a950 has base at 80100000 - ntoskrnl.exe

CPUID:AuthenticAMD 5.6.2 irql:1f SYSVER 0xf0000565

Dll Base DateStmp - Name                Dll Base DateStmp - Name
80100000 337546bf - ntoskrnl.exe          80010000 33247f88 - hal.dll
80001000 334d3a53 - atapi.sys              80007000 33248043 - SCSIPT.SYS
801d7000 336016a2 - Disk.sys               801db000 336015af - CLASS2.SYS
801df000 3356d637 - Ntfs.sys               80237000 344eeb44 - Sivvid.sys
8056e000 344eebdc - NTlce.sys              f1f48000 31ec6c8d - Floppy.SYS
f1f58000 31ec6ca1 - Cdrom.SYS              f228c000 31ec6c99 - Null.SYS
f208c000 31ed868b - KSecDD.SYS             f2290000 335e60cf - Beep.SYS
a0000000 336157ac - win32k.sys              fe0c2000 349a9cdd - mga64.dll
f1ce0000 332483b0 - Cdfs.SYS                fdca2000 31ec6e6c - TDI.SYS
fdc59000 31ed0754 - nbfs.sys                fdc35000 337390ef - tcpip.sys
fdc18000 3362a53a - netbt.sys              f1f68000 33644efb - ibmfent.sys
f1d70000 334d3add - afd.sys                 f2008000 33248371 - netbios.sys
f207c000 31ec6c9b - Parport.SYS            fdc14000 31ec6c9b - Parallel.SYS
f2136000 31ec6c9d - ParVdm.SYS             f1dd0000 332480ab - Serial.SYS
fdbaf000 3339777c - rdr.sys                 fdb9e000 332483b5 - mup.sys
fdaec000 3360f103 - srv.sys

Address dword dump Build [1381] - Name
f206fba4 8016a950 8016a950 00000001 00000086 00000086 00000086 - ntoskrnl.exe
f206fbd0 80115d86 80115d86 00000000 ff87a400 ff87a3f0 ff810408 - ntoskrnl.exe
f206fbc 8019d98f 8019d98f ffffffff 80139a54 80143378 00000000 - ntoskrnl.exe
f206fbf4 80139a54 80139a54 80143378 00000000 230edb30 3c8ca3b0 - ntoskrnl.exe
f206fbf8 80143378 80143378 00000000 230edb30 3c8ca3b0 26448761 - ntoskrnl.exe
f206fc10 8011bd6a 8011bd6a ff676980 ffffffff 34f9ad10 00000000 - ntoskrnl.exe

```

EECS 487

Ideas for good GUI design

GUIs

- Design for what the user knows
 - artists, businessmen, kids
- Avoid too many features at the top level
 - VCRs 1985/2001
- Distinguish beginner/power user, support both:
 - mouse menus for novice
 - keyboard, rapid data input for power user

- Study the user - a human
 - people learn more easily by recognition
 - list of data values rather than prompt for a number
- Different perspectives
 - use mnemonic
 - “of or helping the memory”
 - do not assume metaphor
 - “one thing is spoken of as if it were another”

17


- Metaphor:




- Mnemonic:
 - small
 - not irritating to anyone



18

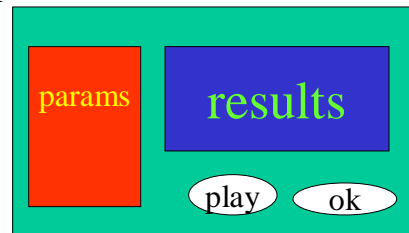
EECS 487	Mnemonics	GUIs
		
19		

EECS 487	GUI	GUIs
<ul style="list-style-type: none">• Be Consistent (example from Windows...)• Visual feedback (how often? 7-10 seconds)<ul style="list-style-type: none">– progress indicator that really works• Audio feedback<ul style="list-style-type: none">– use sparingly, e.g. warning for serious problems		
20		

- Very important for some power users:
ability to customize
 - Emacs
 - VC++ ?
- Some power users like mouse
 - need both

21

- Employ technical writers to do text
- Presentation model
 - again:
 - **be consistent**



22

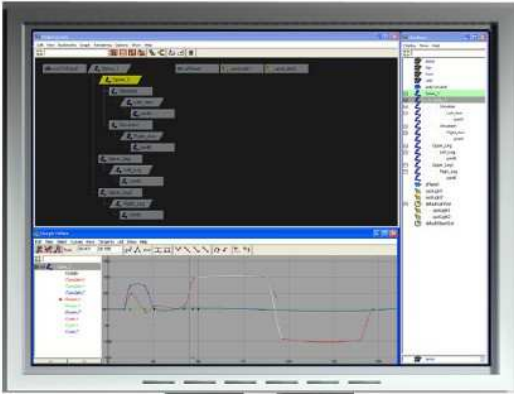
- Modal dialog
 - finite task
 - file open, save as dialogs
 - okay people handle one window at a time
- Modeless dialog
 - no fixed duration
 - search, history list
- Application window
 - data, multiple views, comparison

23

- Visual elements that user interacts with
 - Menu bar
 - max 10 items
 - Pull-down menu
 - max 12 items
 - Check Box
 - max 12 per group box
 - Radio Button
 - max 6 per group box
 - No more than three modeless windows at one time

24

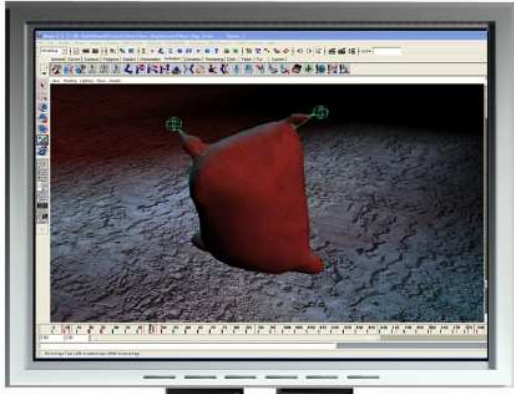
EECS 487 **3D Modeling** **GUIs**



The monitor displays a software interface. On the left side, there is a hierarchical tree structure with several levels of folders and items. The central area shows a 3D view of a scene. At the bottom of the window, there is a graph with multiple colored lines (red, green, blue) plotted against a time axis. The interface includes various toolbars and panels typical of a professional software application.

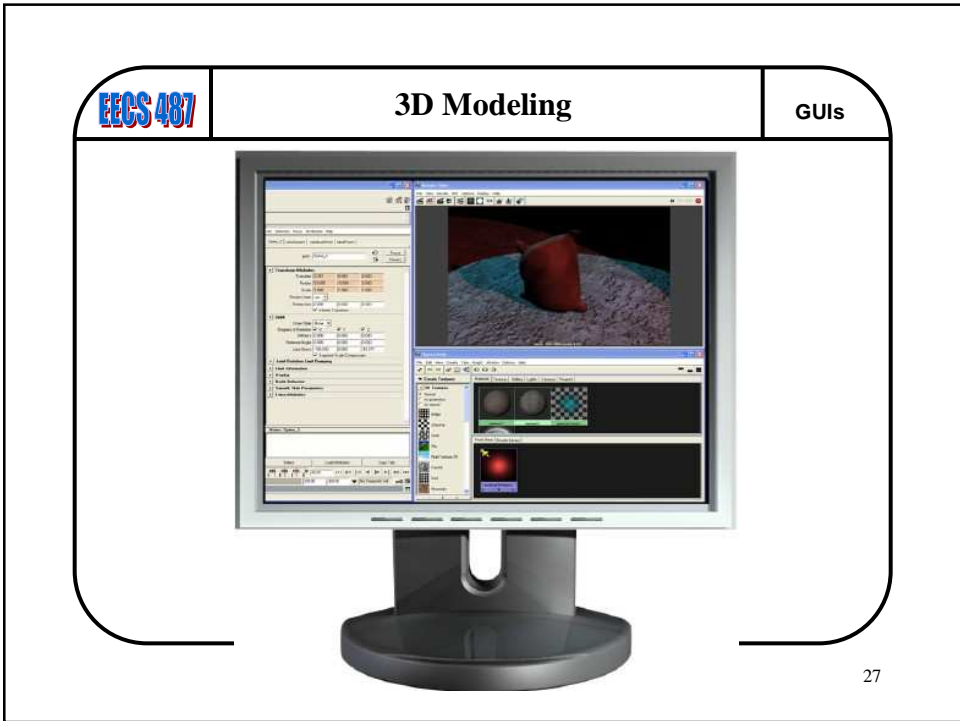
25

EECS 487 **3D Modeling** **GUIs**

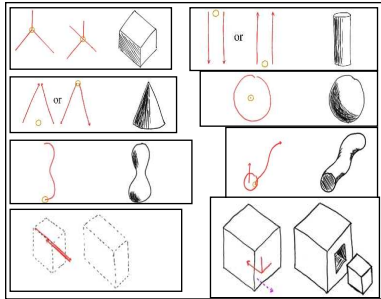
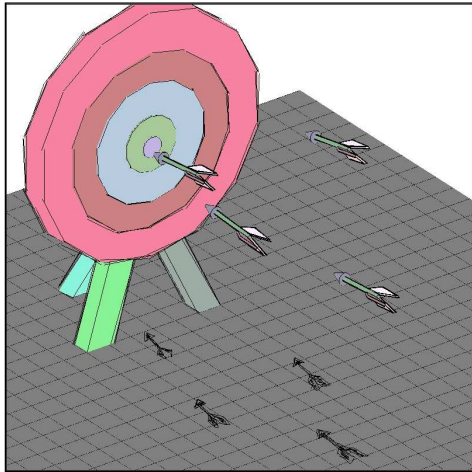


The monitor displays a 3D modeling software interface. The central view shows a red cube on a textured, grey ground plane. The interface includes a top toolbar with various icons for editing and viewing, and a bottom toolbar with more icons. The overall layout is clean and professional, typical of a 3D modeling application.

26



SKETCH: An Interface for Sketching 3D Scenes.
 Zeleznik, Herndon & Hughes. SIGGRAPH 1996.



- Teddy: A Sketching Interface for 3D Freeform Design. Igarashi, Matsuoka & Tanaka. SIGGRAPH 1999.

