Overview of Graphics Systems

• Graphics Hardware
  – Output / Display device
  – Input device
• Graphics Software
  – OpenGL
  – FLTK / GLUT

Output/Display Device

• Color Cathode-ray-tube (CRT) monitors
• Liquid Crystal Displays (LCD)
• Plasma Display Flat Panels.
• Virtual-Reality Systems.
• Color Printers.

Color CRT Monitors

Liquid Crystal Displays (LCD)
Plasma Display Panels

Virtual Reality Systems

Virtual Reality
- Real time graphics
  - Immersion
  - Interaction
  - Other perceptive feedback
    (touch, sound, smell...)

Virtual Reality Systems

Input Devices

- Keyboards
- Mouse
- Trackball
- Joystick
- Touch pad
- Image Scanners
- 3D laser range scanner.
Digital Fringe Projector

OpenGL
- Most widely used 3D graphics Application Program Interface (API).
- Truly open, independent of system platforms.
- Reliable, easy to use and well-documented.
- Default language is C/C++.

OpenGl
- The GL library is the core OpenGL system:
  - modeling, viewing, lighting, clipping
- The GLU library (GL Utility) simplifies common tasks:
  - creation of common objects (e.g. spheres, quadrics)
  - specification of standard views (e.g. perspective, orthographic)
- The GLUT library (GL Utility Toolkit) provides the interface with the window system.
  - window management, menus, mouse interaction

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FLTK
- Fast Light Tool Kit (FLTK)
- www.fltk.org
- C++ oriented
  - A set of UI classes such as Window, box, etc.
- Can mix use with GLUT
- FLUID: fast light UI Designer
  - Fast creation of GUI
  - Automatically writes parts of GUI code from a graphical spec
  - Good for elaborate interfaces

Comments on Programming
- OpenGL plus Glut
  - Simple, easy to program, limitations
- OpenGL plus FLTK
  - Cross platform, more powerful
- OpenGL plus Visual C++
  - Super!
  - Only run under windows system
Case Study
(chalk talk)