CMPS 160  Day 1  Thursday Week 1  9/22/11

- Textbook at Bookstore (expensive)
- Website on Sce
  Piazza → click on enroll as student

- you can go to any session you want

there are 4 standard labs every 2 weeks due
  Lab 3 you choose what interests you

grades 2 midterms, 5 labs. No Final?

Other points are special points
  those can be spent on delaying due dates and things like that.

Coding in Open GL

Lab 1 looks like a painting

Labs may be submitted 3 times
  before due date to earn higher grade
  they must meet minimum to get feedback or "early points"

the basic is a B
  the above & beyond is an A / extra points

Lab 2 - geometric creature...
History of art

Realistic paintings then pictures came now we paint abstract

- (geometry)
- (amazingly real... still very clean)
- (efficiency)

Rendering is what we're mostly doing in this class

Graphical representations of people (moving) still has a way to go.

Hair is finally close

There are still a lot of challenges in nature we have trouble representing.

However, now the question is how do we get it efficiently.

The best way to do ppl involves scanning their motions.

Glu is easy search it online and download
Day 2

Displays/IMAGES

get stuff in path (put in executable dir) for glut & openGl to work

Displays (underlying technology of screen)

Frame Buffer

each pixel has color, color is R-G-B

lab 1 is turning on & off each pixel
(in 3D pixels also have depth)

Color depth is standard 24 (8 for each red green blue)

Cathode ray tube - first widely used electronic display

C.T.R. - does lines, now its all pixels

Phosphorus is what being drawn on, it decays to black over time, that time must be perfect

Interlacing & progressive scan

they couldn’t dump enough info over lines at one time, so they did every other line

fow of the laser was what determined how good the TV was

new computers & tv’s like progressive, problem is

DVs & things like interlaced. Some DVD players are progressive so that means they take the interlaced disk & fix it for the progressive TV.

Vector displays your program controls the laser gun directly.

this could be faster for certain things, & you can get more brightness
**LCD** flat panel or projection display

light goes through polarizer then goes through block which twists polarization if necessary. Different polarization means different colors.

Color R G B (addition for computers, cyan rather than subtraction (paints))

Every pixel has a red / green / blue

Traditional Mask Trinitron

**DLP** chip w/ grid of little mirrors.
mirrors move around & which way light reflects determine colors.

Each mirror is a separate pixel

How do you control intensity?

Amount of time mirrors are open

When you move in front of DLP projector quickly there will be a little rainbow shadow to your motions

Problem w/ pixels:

How make it less blocky?

Make some greyer, some pixels around slightly manipulated, you can get boss fonts.

E-ink Paper Display while is black, voltage effects how much of each comes up. Pixels are underneath, then the bead medium makes it look less perfect
Lab 1

due next Friday (check schedule)

load the image. Store in buffer of memory.  
create window, read pixel out of image whenever mouse is.

OpenGL is library. GLUT is the window system

there is starter code on web.

Intro to OpenGL/GLUT

OpenGL is interface to graphics hardware
- Window/Operating system is independent
OpenGL renders primitive images

GLUT is OpenGL toolkit

Sample Code

```c
#include <GL/glut.h>
#include <GL/glu.h>

void main (char **argc, int argv) {
    glutDisplayFunc(display);  // These are callback functions, not variables.
    init();
    glutMainLoop();

    glFlush(); says flush all buffers, make sure you have or might only display on some machines.
    mouse function determines clicks.
}
```

Event Driver
gl Vertex 3 f v

- There's a callback to mouse motion
- Keyboard commands (quit, save, etc.)

- ppm has load/save canvas info