

# Handouts: Raster Graphics Hardware

## OpenGL Basics

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- OpenGL structure
- More basic graphics information
- Assignment #1

## OpenGL

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- 3D graphics library
  - Output only: render graphics
    - Only knows about "graphics contexts"
- Platform independent: No support for
  - Window creation
    - GLX
    - GLW
  - Input

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## OpenGL is an "Immediate-mode" 3D Library

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- Immediate vs. retained
  - command/primitive sequence vs. models
  - ie. OpenGL vs. OpenInventor
  
- Primitives
  - lines, points, polygons
  
- Commands
  - transformations, color, line style, etc.

## The Screen Buffers

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- Pixels
  
- Bitplanes
  
- Framebuffer
  - Color
  - Depth
  - ...

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## Data Types

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- Platform independent types
  - GLbyte (8b, signed char)
  - GLshort (16b, short)
  - GLint, GLsizei (32b, int or long)
  - GLfloat, GLclampf (32bf, float)
  - GLdouble, GLclampd (64bf, double)
  - GLubyte, GLboolean, GLushort, GLuint, GLenum, GLbitfield

## OpenGL Pipeline (p. 11)

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## Initialization: Coordinate Systems

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- `gluOrtho2D ( l, r, b, t);`

## Miscellaneous initialization

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- `glClearColor (r, g, b, a);`
- `glMatrixMode( m );`
  - `GL_PROJECTION`
  - `GL_MODELVIEW`
- `glLoadIdentity ();`

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## Display Functions

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- `glClear (buffer)`
- `glIndexi (i)`
- `glutSwapBuffers ();`

## Creating fragments

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- `glBegin (type)`
  - `GL_LINES, GL_POINTS, GL_TRIANGLES, GL_QUADS, GL_POLYGON, ... (p.43)`
- `glEnd ();`

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## Specifying points

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- `glVertex{234}{sifd}(TYPE coords);` (p.41)

## Moving on ...

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- Assignment #1
  - Due Friday Sept. 3rd
  - Purpose:
    - learn how to write GLUT/OpenGL programs
- Read sections on Syllabus