

# Handouts: Raster Graphics Hardware

## OpenGL Basics



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

## OpenGL



- 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



- 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



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

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## Data Types

- Platform independent types
  - | GLbyte (8b, byte)
  - | GLshort (16b, short)
  - | GLint, GLsizei (32b, int)
  - | GLfloat, GLclampf (32bf, float)
  - | GLdouble, GLclampd (64bf, double)
  - | GLubyte, GLboolean, GLushort, GLuint

## OpenGL Pipeline (p. 11)

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## Initialization: Coordinate Systems

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



## Miscellaneous initialization

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



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## Display Functions

- `glClear (buffer)`
- `glColor3f (r, g, b);`
- `glIndexi (i)`



## Creating fragments

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



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## Specifying points

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



## Moving on ...

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

