Introduction to Computer Graphics with WebGL
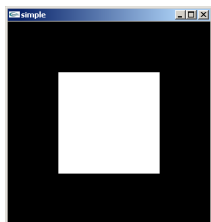
Ed Angel
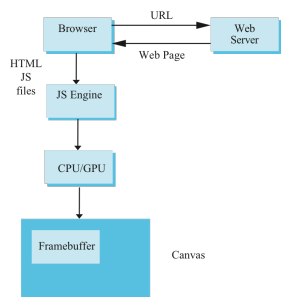
Square Program
Part 1

1

A OpenGL Simple Program

Generate a square on a solid background

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Execution in Browser

URL

Browser → Web Server

Web Page

HTML JS files

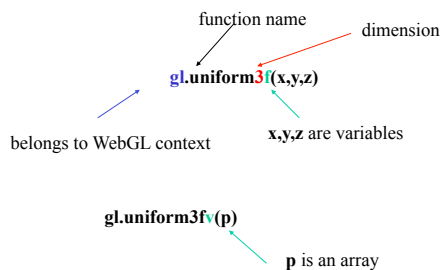JS Engine

CPU/GPU

Framebuffer

Canvas

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Event Loop

- Remember that the sample program specifies a render function which is an *event listener* or *callback* function
  - Every program should have a render function
  - For a static application we need only execute the render function once
  - In a dynamic application, the render function can call itself recursively but each redrawing of the display must be triggered by an event
  - other callbacks will allow us to get input from the mouse and keyboard and work with menus, sliders, buttons and other types of input

Lack of Object Orientation

- All versions of OpenGL are not object oriented so that there are multiple functions for a given logical function
- Example: sending values to shaders
  - `gl.uniform3f`
  - `gl.uniform2i`
  - `gl.uniform3dv`
- Underlying storage mode is the same

WebGL function format

function name

dimension

gl.uniform3f(x,y,z)

belongs to WebGL context

x,y,z are variables

gl.uniform3fv(p)

p is an array

WebGL constants

- Most constants are defined in the WebGL context
  - In desktop OpenGL, they were in #include files such as gl.h
- Examples
  - desktop OpenGL
    - glEnable(GL_DEPTH_TEST);
  - WebGL
    - gl.enable(gl.DEPTH_TEST)
    - gl.clear(gl.COLOR_BUFFER_BIT)

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