Spring ’11 CIS 441/541 Final Review

You may bring one page of notes, front and back.

You may bring a calculator but shouldn’t need one.

Questions will be in short-answer format with partial credit for partial answers.

Questions will require you to read GLSL code and write GLSL pseudocode.

Topics:

- All midterm topics, though emphasis will be on topics covered since the midterm
- Texture mapping: 1D, 2D, 3D texture coordinates, textures, filtering
- Compositing and blending: linear blending of source, destination colors, fog
- Programmable pipelines: Vertex and fragment shaders, uniform, attribute, varying parameters
- GLSL types: mat3, mat4, vec3, vec4, float, overloaded +, -, *, /
- GLSL matrices: gl_ModelViewProjectionMatrix, gl_ModelViewMatrix, gl_NormalMatrix
- GLSL vertex: gl_Vertex, gl_Normal, gl_Color, gl_Position, gl_FrontColor
- GLSL fragment: gl_Color, gl_FragColor
- GLSL lights: gl_LightSource[0].position
- GLSL materials: gl_FrontLightProduct[0].{diffuse, specular, ambient}, gl_FrontMaterial.shininess
- GLSL functions: max(), dot(), cross(), pow(), reflect(), length(), normalize(), inverse()
- Interpolated, Bezier curves: properties (e.g., draw approximation) geometry matrices, evaluating

Sample questions:

1. [20] Write pseudocode for a vertex shader which scales the vertex anisotropically by a factor of (2.0, 1.0, 1.0) in object space, projects the vertex into clip coordinates, and preserves the vertex color:

2. [5] Draw an approximation of the Bezier curve which results from the control points (-1.0, 0.0), (-1.0, 1.0), (1.0, 1.0), (1.0, 0.0):