Geometric Morphing with the Vertex Shader

Morphing a Sphere into a Circle

Blend = 0.00  Blend = 0.25  Blend = 0.50

Blend = 0.75  Blend = 1.00
out vec2 vST;
out float vLightIntensity;
out vec4 vColor;
const float TWOPI = 2. * 3.14159265;

// original model coords (sphere):
vec4 vertex0 = aVertex;
vec3 norm0 = aNormal;

// circle coords:
vST = aTexCoord0.st;
float radius = 1. - vST.t;
float theta = TWOPI * vST.s;
vec4 circle = vec4(radius*cos(theta), radius*sin(theta), 0., 1.);
vec3 circlenorm = vec3(0., 0., 1.);

vST += vec2( OffsetS, OffsetT);

// blend:
vec4 theVertex = mix(vertex0, circle, Blend);
vec3 theNormal = normalize(mix(norm0, circlenorm, Blend));

// do the lighting:
vec3 tnorm = normalize(vec3(uNormalMatrix * theNormal));
vec3 LightPos = vec3(5., 10., 10.);
vec3 ECposition = vec3(uModelViewMatrix * theVertex);
vLightIntensity = abs(dot(normalize(LightPos - ECposition), tnorm));
if (vLightIntensity < 0.2)
  vLightIntensity = 0.2;

vColor = aColor;
gl_Position = uModelViewProjectionMatrix * theVertex;

A possible vis application ?

Original texture map
Mapped onto a Sphere
Morphed into a Circle
Morphing a Cow into a Sphere

const float SIDE = 2.;
vec4 vertex = aVertex;
vertex.xyz *= 4. / length(vertex.xyz);
vertex.xyz = clamp( vertex.xyz, -SIDE, SIDE );

Note: the “face” in the cube cow is there because the normals were not morphed into cube normals – they were left as cow normals.