Assignment 3: Texture Mapping

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1. Environment:

a. OS: Mac OS
b. CPU :intel i7 4 core
c. GPU:Intel Iris Plus Graphics 655 1536 MB
d. RAM:8G

2. Implementation

a. Bind texture: accordint to hint to implement process of binding texture;

```
// [TODO] Bind the image to texture
// Hint: glGenTextures, glBindTexture, glTexImage2D, glGenerateMipmap
glGenTextures(1, &tex);
glBindTexture(GL_TEXTURE_2D, tex);
glTexImage2D(GL_TEXTURE_2D, 0, GL_RGBA, width, height, 0, GL_RGBA, GL_UNSIGNED_BYTE, data);
glGenerateMipmap(GL_TEXTURE_2D);
```

b. Pass unifrom “tex” to shader;

```
// [TODO] Get uniform location of texture
iLocTex = glGetUniformLocation(program, "tex");
```

c. Active Texture;

```
glActiveTexture(GL_TEXTURE0);
glBindTexture(GL_TEXTURE_2D, models[cur_idx].shapes[i].material.diffuseTexture);
  cout<<"diffuseTexture ["<<i<<"]: "<< models[cur_idx].shapes[i].material.diffuseTexture<<endl;
switchTexParameter();
```

d. Switch parameters;

```
void switchTexParameter(){
    if (mag_linear){
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MAG_FILTER, GL_LINEAR);
    }
    else{
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MAG_FILTER, GL_NEAREST);
    }

    if (min_linear){
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MIN_FILTER, GL_LINEAR_MIPMAP_LINEAR);
    }
    else{
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MIN_FILTER, GL_NEAREST_MIPMAP_NEAREST);
    }
    if (warp_clamp){
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_WRAP_S, GL_MIRRORED_REPEAT);
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_WRAP_T, GL_MIRRORED_REPEAT);
    }
    else{
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_WRAP_S, GL_REPEAT);
        glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_WRAP_T, GL_REPEAT);
    }
}
```

3. Control

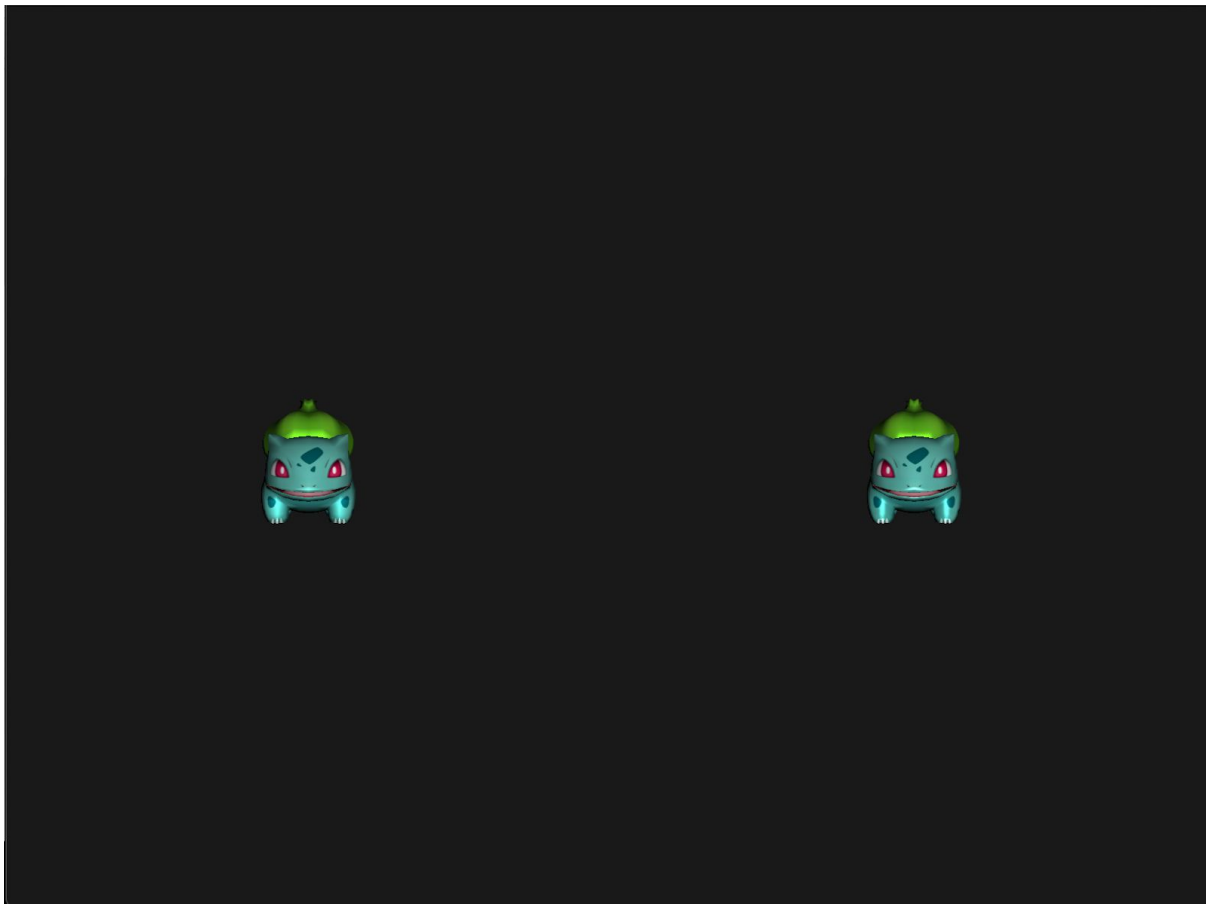
a.

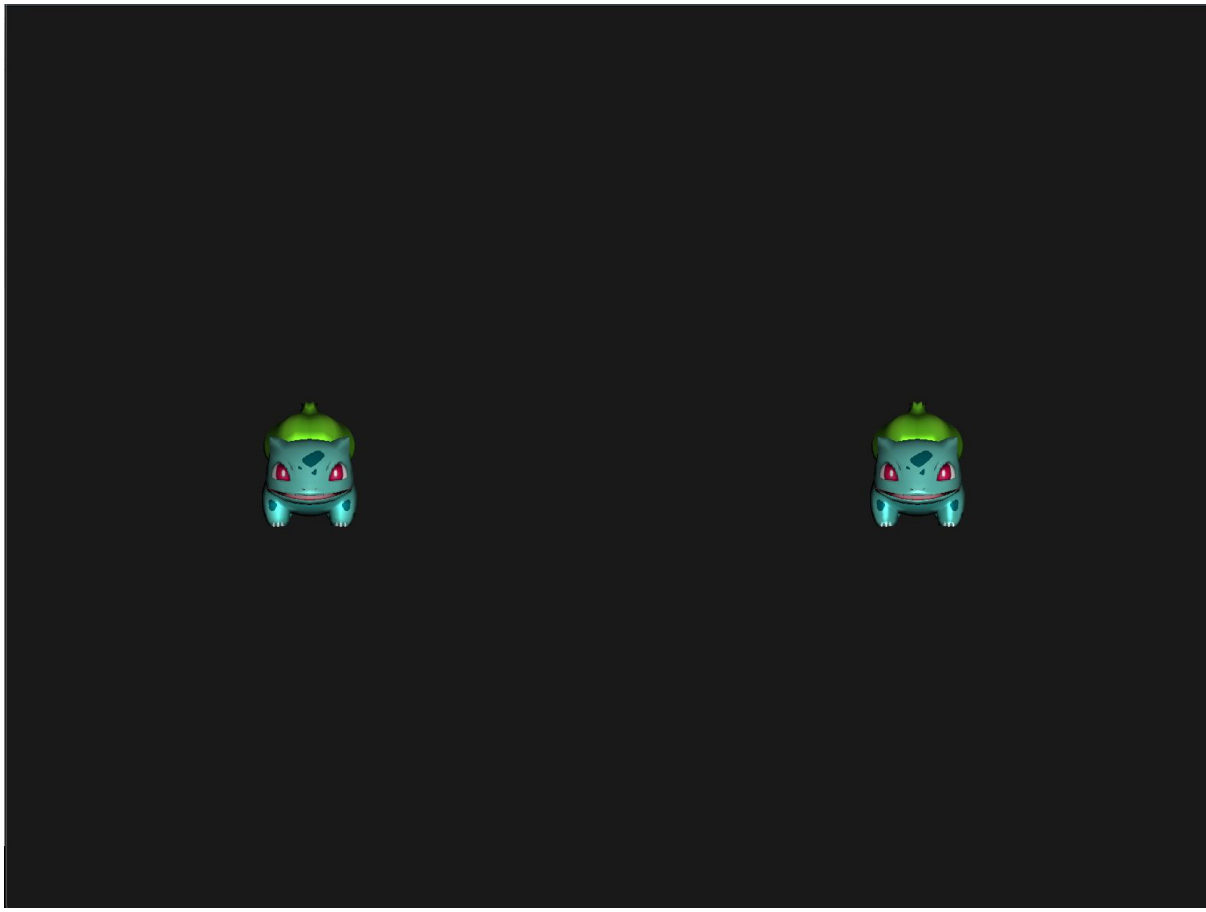
```
-------------------------------------------------
Using manual :
    z : move to previous model
    x : move to next model
    o : switch to Orthogonal
    p : switch to Perspective
    s : GeoScaling
    t : GeoTranslation
    r : GeoRotation
    e : ViewEye
    c : ViewCenter
    u : ViewUp
    i : Control Information
    j : Shininess
    k : Light Editing mode
    l : Light mode
    g : Magnification mode
    v : Minification mode
    b : Texture Coordinate Addressing mode
-------------------------------------------------
```

4. Demo

a. Magnification

b. Minification





c. Texture Coordinate Addressing