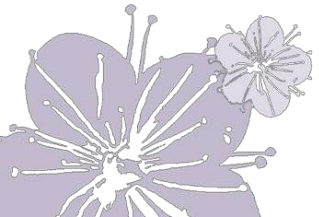
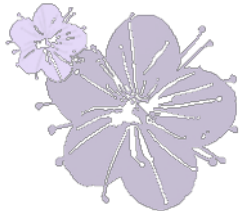
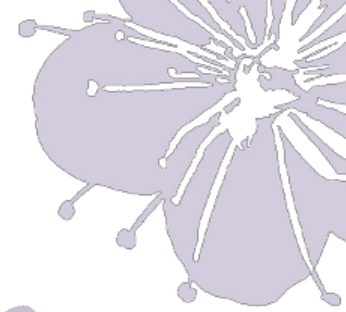


Homework 1

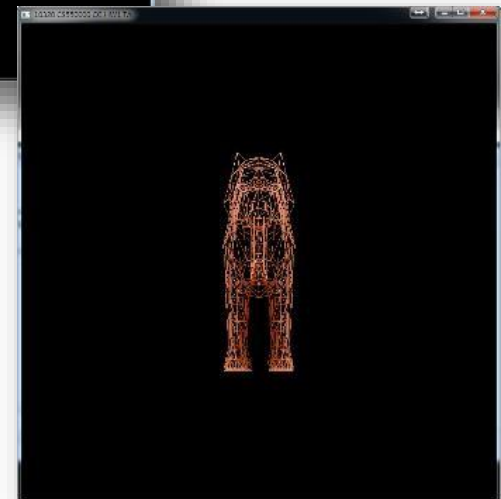
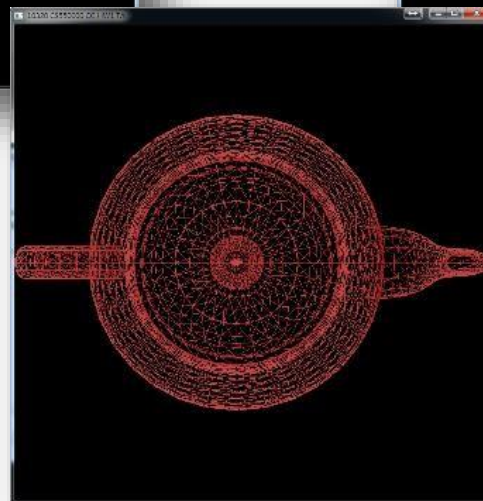
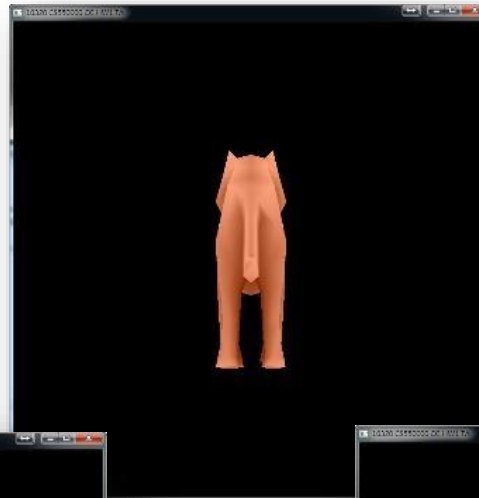
Remarks

CS 550000 Computer Graphics
March 8, 2017
CGVLab, NTHUCS



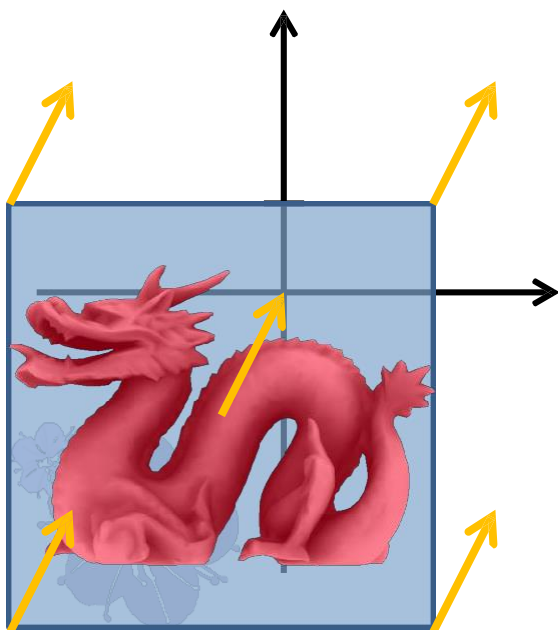
Goal

- Render a 3D model properly on the screen.

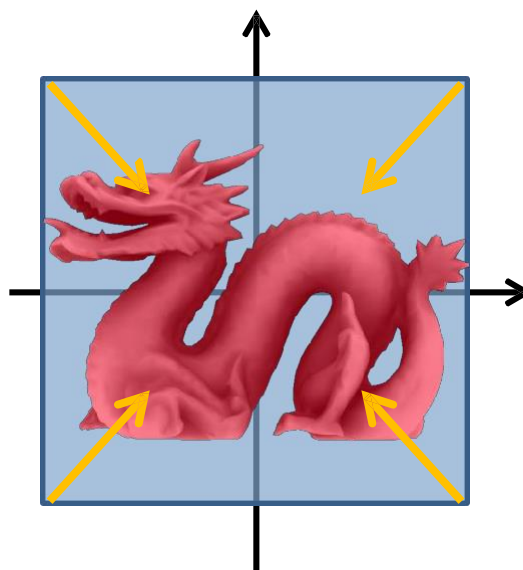


Normalization

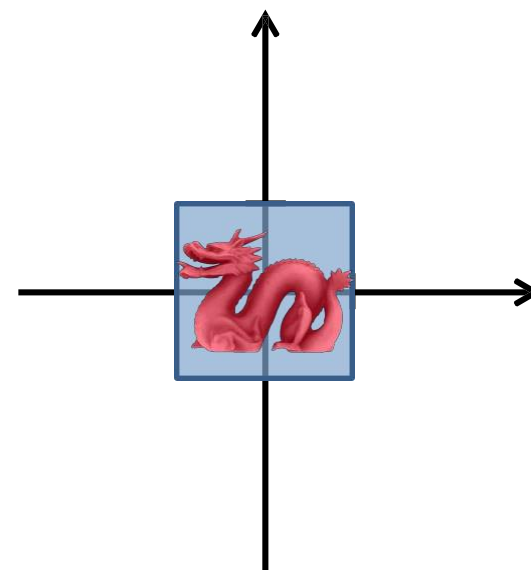
1. Translation



2. Scaling

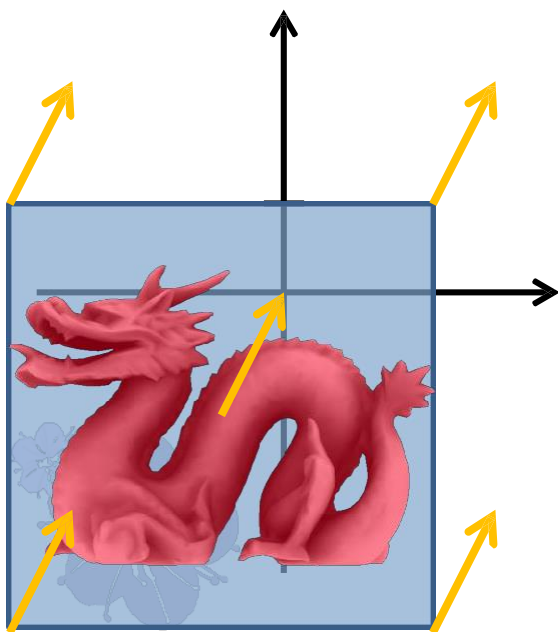


Normalized!

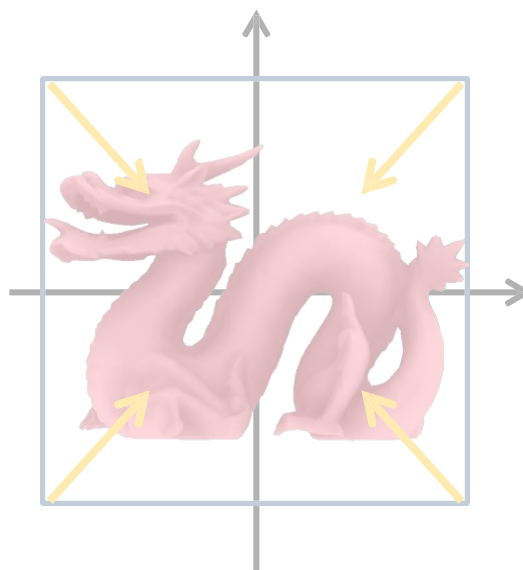


Normalization

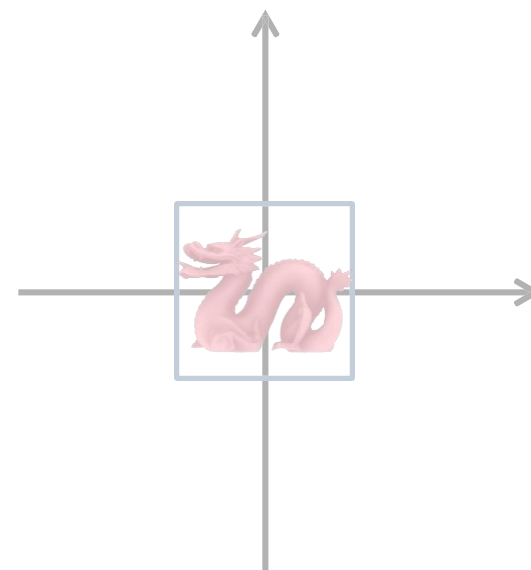
1. Translation



2. Scaling

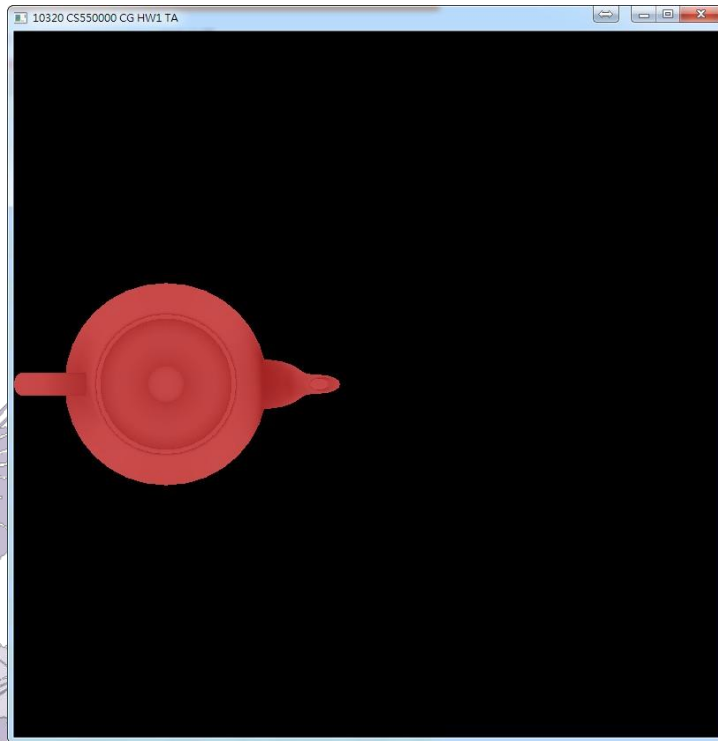


Normalized!



Translation

- Not Located at Origin (0, 0, 0)
 - center of model \neq center of mass
 - DO NOT set initial value of (max, min) as (0, 0) or (-100, 100)



$x \in [-263.80969, -146.79413]$

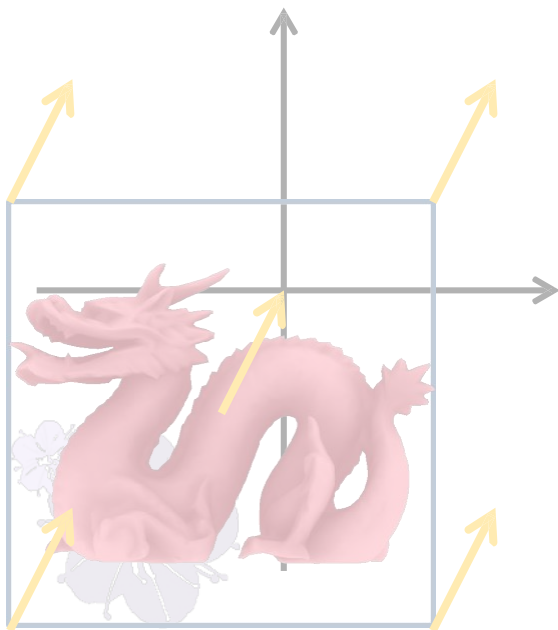
$y \in [-36.36507, 36.39270]$

$z \in [53.82454, 111.12128]$

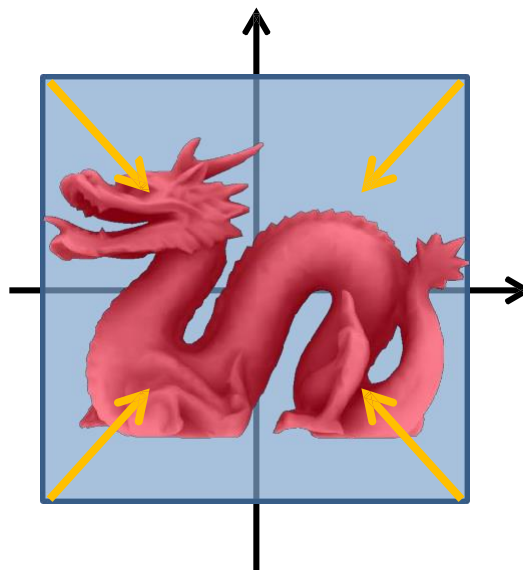


Normalization

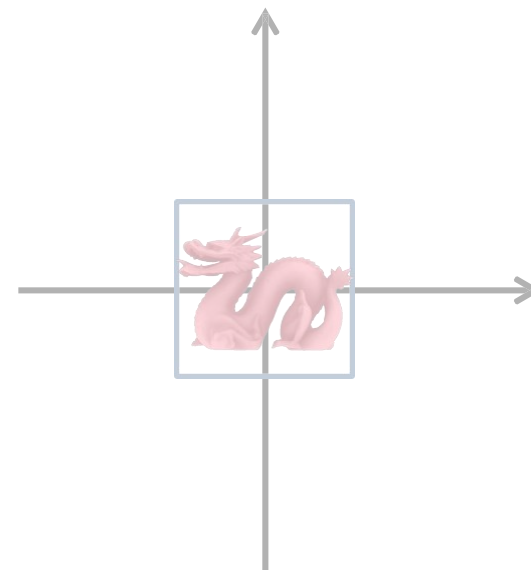
1. Translation



2. Scaling

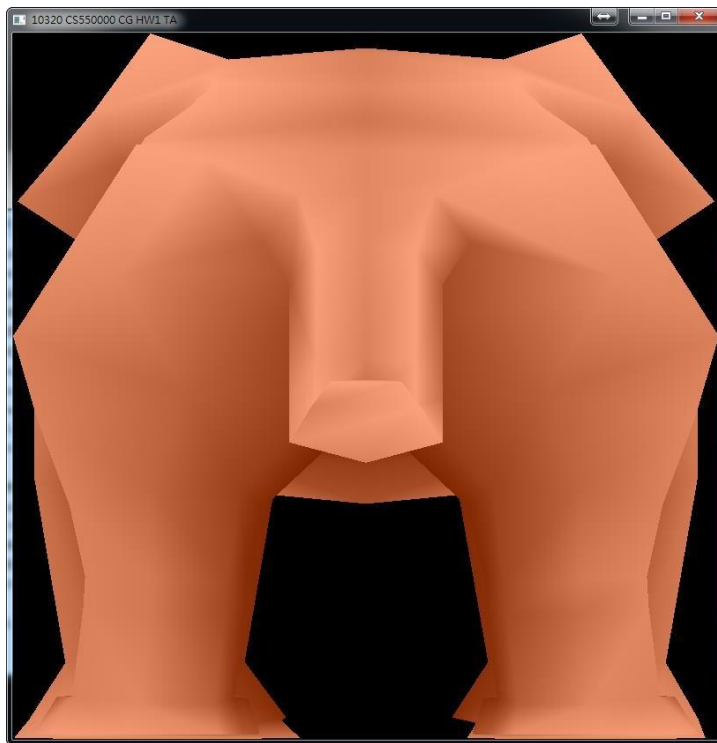


Normalized!



Scaling

- Non-Uniform Scaling
 - Set different scaling factor of x , y , z .
 - Model will deform.

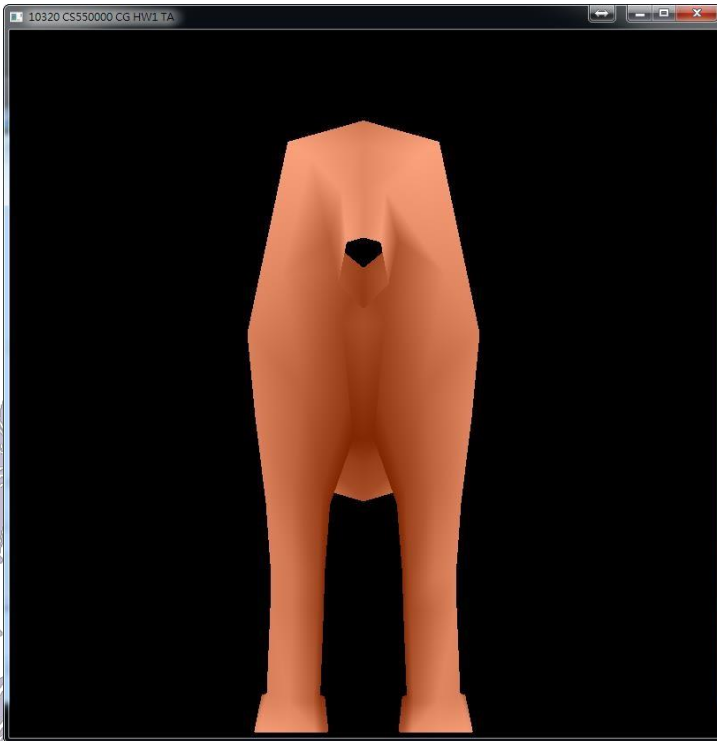


Scaling

- Not Considering Z-Axis

- Vertices may not fit the bounding box of $\{(x, y, z) \mid x, y, z \in [-1, 1]\}$

Clipped z within [-1, 1]

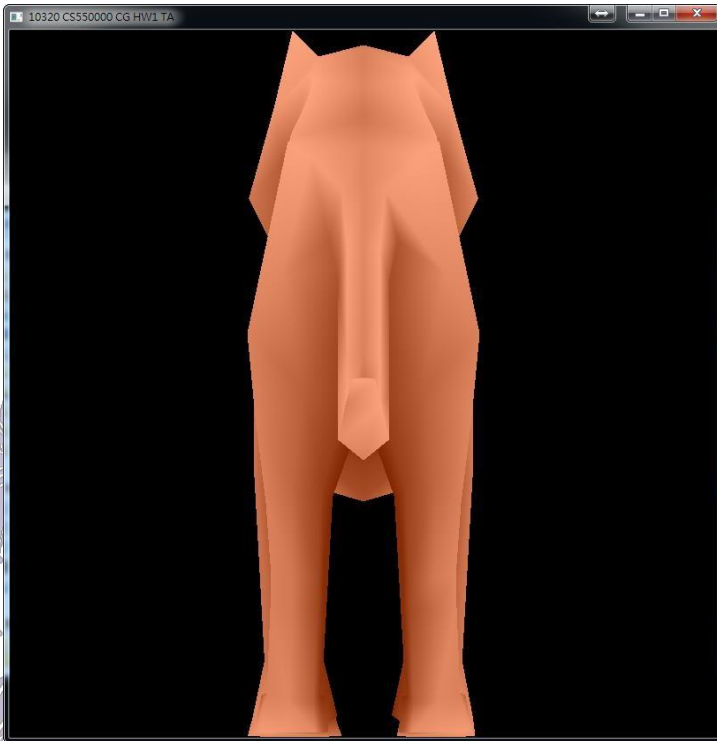


```
1 attribute vec4 av4position;
2 attribute vec3 av3color;
3
4 varying vec3 vv3color;
5
6 void main() {
7     // NOTE!! column major
8     mat4 mvp = mat4(
9         vec4(1, 0, 0, 0),
10        vec4(0, 1, 0, 0),
11        vec4(0, 0, -1, 0),
12        vec4(0, 0, 0, 1)
13    );
14    vv3color = av3color;
15    gl_Position = mvp * av4position;
16 }
17
```


Scaling

- Not Considering Z-Axis

- Vertices may not fit the bounding box of $\{(x, y, z) \mid x, y, z \in [-1, 1]\}$



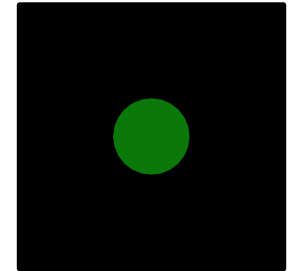
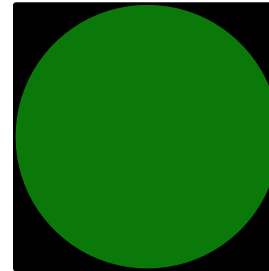
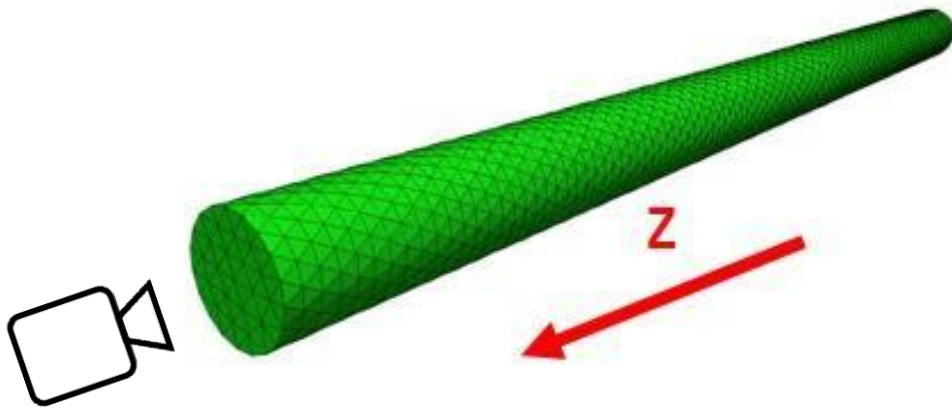
Clipped z within [-10, 10]

```
1 attribute vec4 av4position;
2 attribute vec3 av3color;
3
4 varying vec3 vv3color;
5
6 void main() {
7     // NOTE!! column major
8     mat4 mvp = mat4(
9         vec4(1, 0, 0, 0),
10        vec4(0, 1, 0, 0),
11        vec4(0, 0, -0.1, 0),
12        vec4(0, 0, 0, 1)
13    );
14    vv3color = av3color;
15    gl_Position = mvp * av4position;
16 }
17
```

Scaling

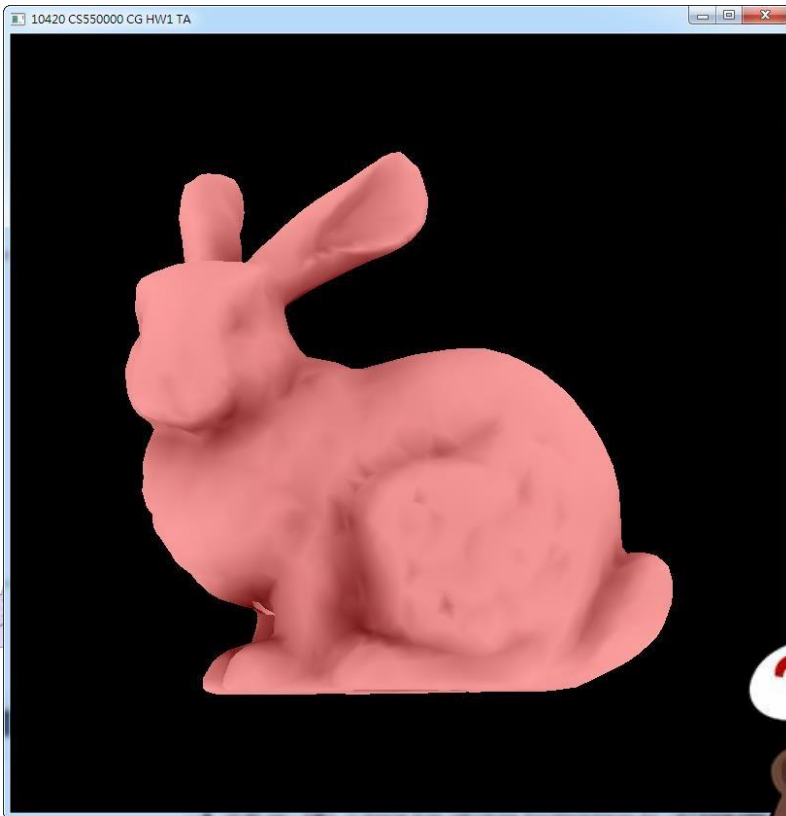
- Not Considering Z-Axis

- Vertices may not fit the bounding box of $\{(x, y, z) \mid x, y, z \in [-1, 1]\}$
- Think of a long z-orientation cylinder.

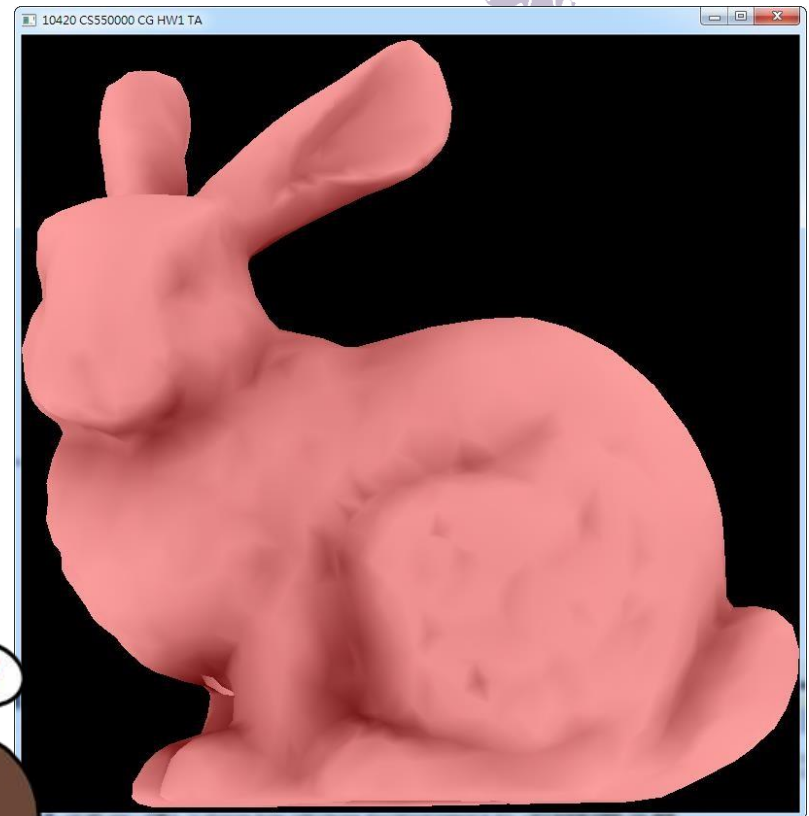


Scaling

- Absolute value?



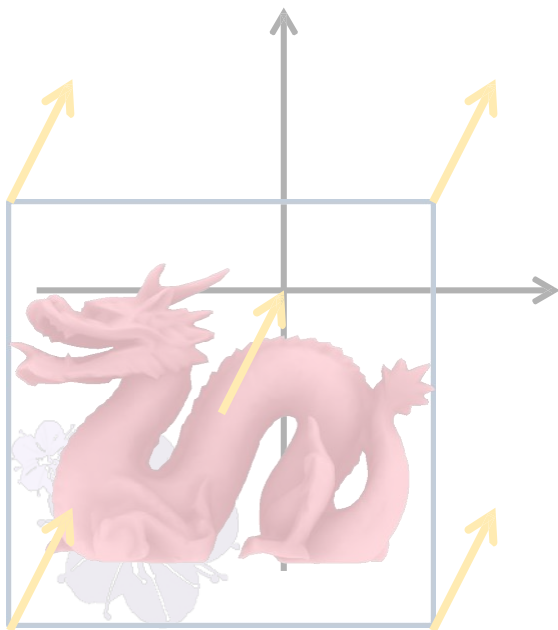
```
width  = abs(maxX) + abs(minX)
height = abs(maxY) + abs(minY)
depth  = abs(maxZ) + abs(minZ)
```



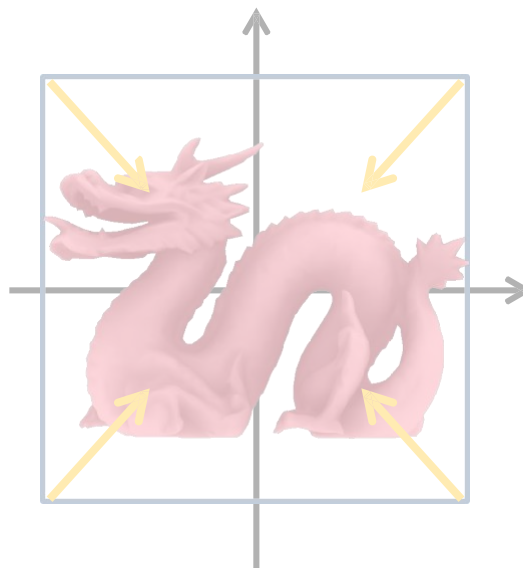
```
width  = maxX - minX
height = maxY - minY
depth  = maxZ - minZ
```

Normalization

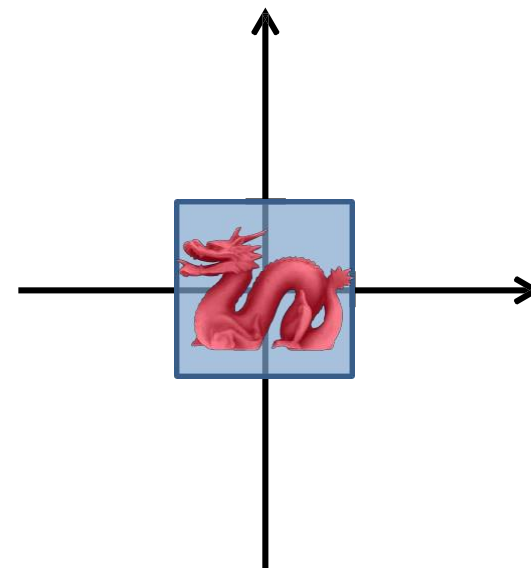
1. Translation



2. Scaling



Normalized!



Some USEFUL OpenGL API

```
void glDrawArrays(   GLenum mode,  
                    GLint  first,  
                    GLsizei count);    = number of vertices to draw
```

<https://www.opengl.org/sdk/docs/man/html/glDrawArrays.xhtml>

```
void glPolygonMode( GLenum face,  
                   GLenum mode);
```

<https://www.opengl.org/sdk/docs/man/html/glPolygonMode.xhtml>



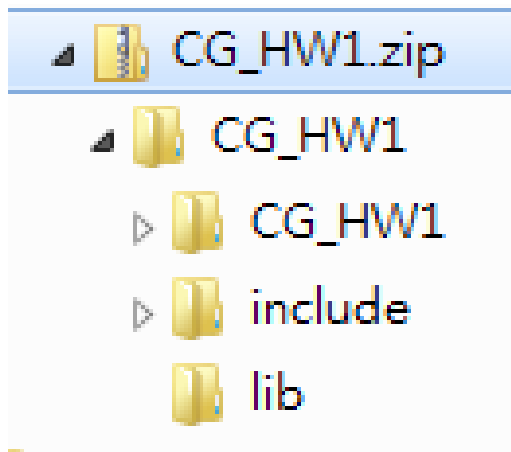
Submission

- Due date: **April 6th, 2016**
- Submit your project to **iLMS**.
- Filename: **HW1_XXXXXXXXX.zip**
- Put both “**lib**” and “**include**” folder in your zip file



位置: 計算機圖學Computer Graphics > 作業 ✓ 新增 | 複製

項次	標題	分組作業	已評分 / 繳交	期限	動作
1	HW1: Draw Some Geometry Models		0 / 0	04-06 23:59	編輯 刪除



名稱	大小	類型
CG_HW1.sdf	31,700 KB	SQL Server Compact ...
CG_HW1.suo	44 KB	Visual Studio Solutio...
CG_HW1.sln	1 KB	Microsoft Visual Stud...
CG_HW1.opensdf	0 KB	OPENSDF 檔案
CG_HW1		檔案資料夾
Debug		檔案資料夾
ipch		檔案資料夾

建立日期: 2015/3/17 下午 08:09
大小: 24.0 MB
資料夾: cg_hw1-f20be826

***** Remove “ipch” folder and “.sdf” file. *****



Reminders

- Late submission is accepted. (-10/week)
- Ask and share information through iLMS



1032 (2015-02-01~2015-07-31)

課程: [計算機圖學Computer Graph](#) ▼

課程資訊 [\[報表\]](#)

訪客: 5518

文章: 269

討論: 190


容量: 剩餘 401.5 MB (2.9 GB)


老師: 李潤容 ☒

助教: 羅逸翔 ☒, 阮維廷 ☒, 蔡繪琦 ☒


閱讀權限: 不開放旁聽 (僅成員可以閱讀)

課程功能 [\[管理\]](#)

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 [課程說明](#)

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 [討論區 \(190\)](#)

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