



# Interactive Computer Graphics

## CS 418 – Spring 2011

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# Agenda for today

- Communication Channels & Resources
- **Set up Programming Environment!**
- Mesh

# Newsgroup

- Post questions that might be beneficial to everyone
- <http://groups.google.com/group/cs418sp10uiuc>
  - You need to provide your netid so I can figure you are not a spammer.
- Don't wait until the night before the MP/HW is due
  - Send your questions and ask for help soon!

# Email

- gchen10 at illinois.edu
- Put CS418 in the subject
- Try the newsgroup first  
(unless it is a personal matter)

# Resources

- Tutorials
  - <http://nehe.gamedev.net/>
  - <http://www.lighthouse3d.com/opengl/>
  - <http://www.xmission.com/~nate/opengl.html>
- Books
  - OpenGL Programming Guide (OpenGL Red Book)
- Libraries:
  - DevIL (OpenIL): <http://openil.sourceforge.net/>
  - CXImage: <http://www.codeproject.com/KB/graphics/cximage.aspx>

# Student Graphics @ Illinois

- UIUC Student Chapter of ACM SIGGRAPH
  - <http://www.acm.uiuc.edu/siggraph/>
  - Short Films, Video Games, Graphics Research
- GameBuilders
  - <http://www.acm.uiuc.edu/gamebuilders/>
  - Video Games

# Compile on Windows

- Microsoft Visual Studio (2008 and later)
- OpenGL (already provided)
- GLUT: <http://www.opengl.org/resources/libraries/glut/>
  - Put files in the default search path **OR**
  - Link through the project settings
- Use the DemoOpenGL code on agora page (**Strongly Recommended**)
  - <https://wiki.engr.illinois.edu/display/cs418sp12/Home>
- <http://nehe.gamedev.net/data/lessons/lesson.asp?lesson=01> **OR**
- <http://saurabhinhyd.wordpress.com/2006/11/30/opengl-and-visual-c-2005-express/>

# GLUT

- Idea: put the files in the default path for VS
- Copy
  - glut32.dll -> C:\Windows\System32\glut32.dll
    - This may not work for VS2010. Put glut32.dll directly in the debug folder with the exe file
  - glut32.lib ->
    - C:\Program Files\\VC\lib\GL\glut32.lib **OR**
    - C:\Program Files\\VC\PlatformSDK\GL\glut32.lib
  - glut.h ->
    - C:\Program Files\\VC\include\GL\glut.h **OR**
    - C:\Program Files\\VC\PlatformSDK\include\GL\glut.h



# Troubleshooting

- Check if you use the default `stdafx.h` precompiled header option in your project, and forget to include "**`stdafx.h`**" or "**`stdlib.h`**" in your code.
- Check if the compiler is complaining about linking error. Try to add **`glut32.lib`**, **`glu32.lib`**, and **`opengl32.lib`** in your link dependency.

# Compile on Linux

- Get the developer packages
  - OpenGL
    - Nvidia or Mesa version etc.
  - Glut
    - freeGlut
- Ensure that install directories are in your compiler path
- Compile with the appropriate flags (-lglut)
  - [http://www.videotutorialsrock.com/opengl\\_tutorial/get\\_opengl\\_setup\\_linux/video.php](http://www.videotutorialsrock.com/opengl_tutorial/get_opengl_setup_linux/video.php)

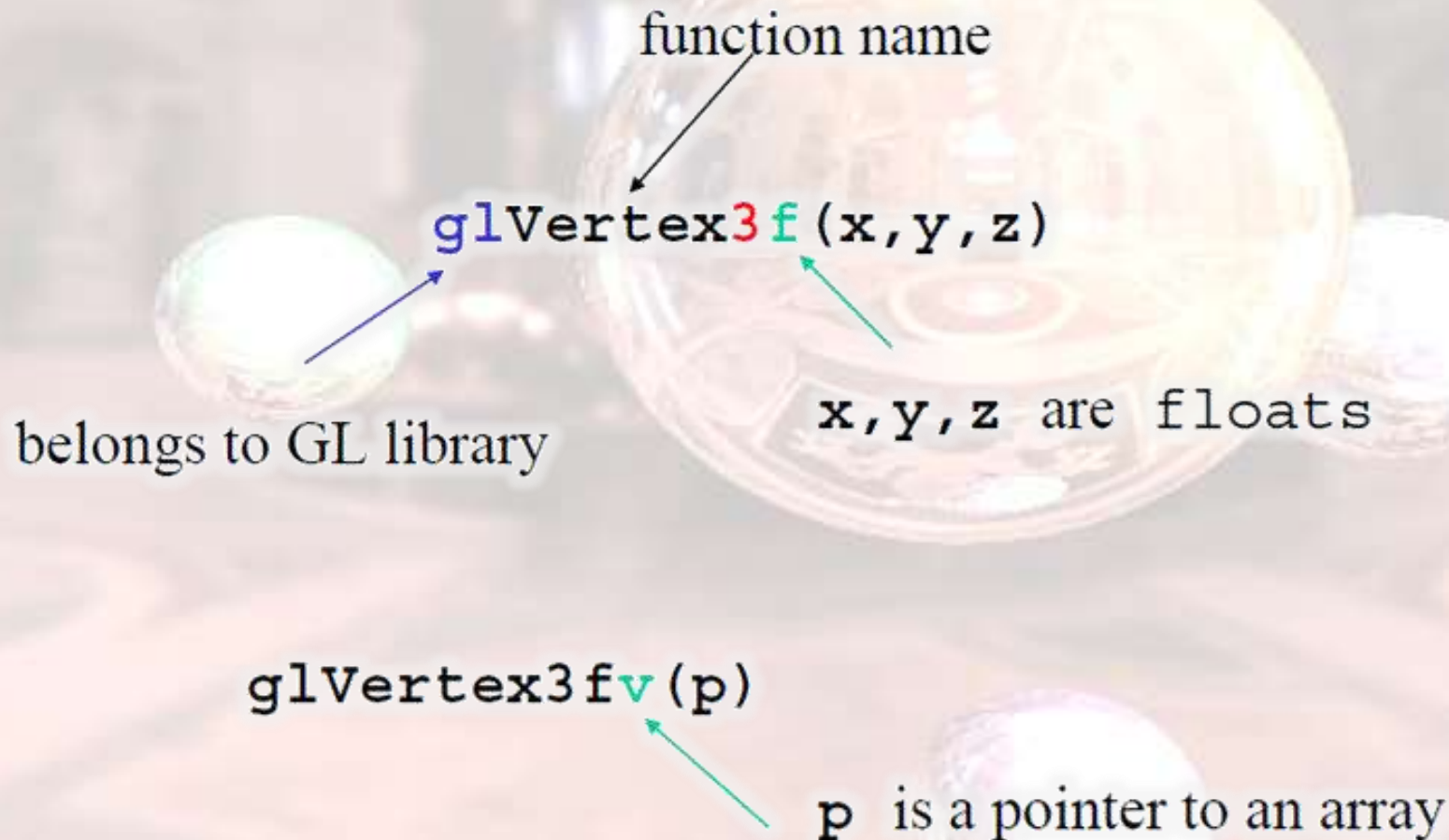
# Compile on OSX

- See the agora class page.
- Also:
  - <http://blog.onesadcookie.com/2007/12/xcodeglut-tutorial.html>
  - [http://nehe.gamedev.net/data/lessons/lesson.asp?lesson=Mac\\_OS](http://nehe.gamedev.net/data/lessons/lesson.asp?lesson=Mac_OS)
  - [http://nehe.gamedev.net/data/lessons/lesson.asp?lesson=Mac\\_OS\\_X](http://nehe.gamedev.net/data/lessons/lesson.asp?lesson=Mac_OS_X)

# Tips for success

- Start Early
- Compile/Debug often
- Use a debugger (<http://www.gremedy.com/>)
- Ask questions early
- Use **libgfx** by Michael Garland:  
<http://mgarland.org/software/libgfx.html>
- Start Early
- **Start Early**

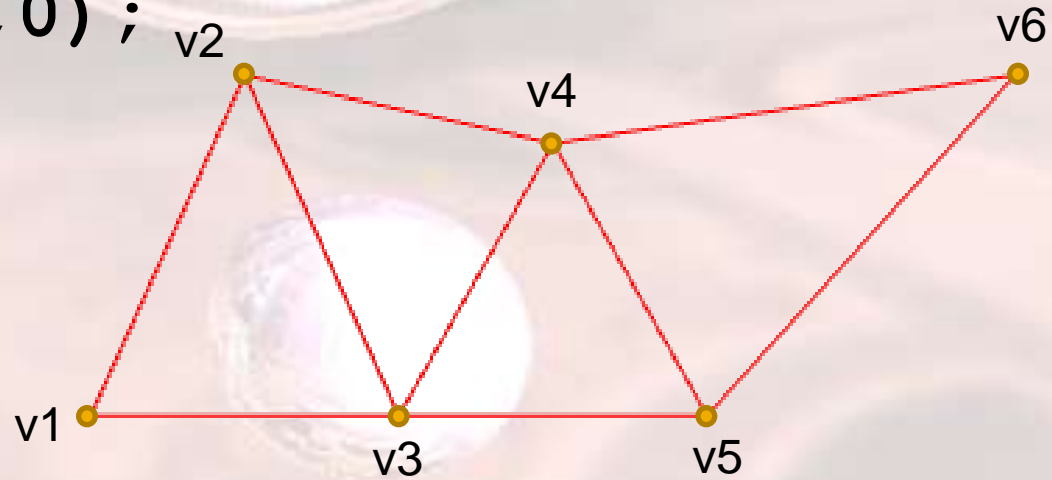
# OpenGL Function Format



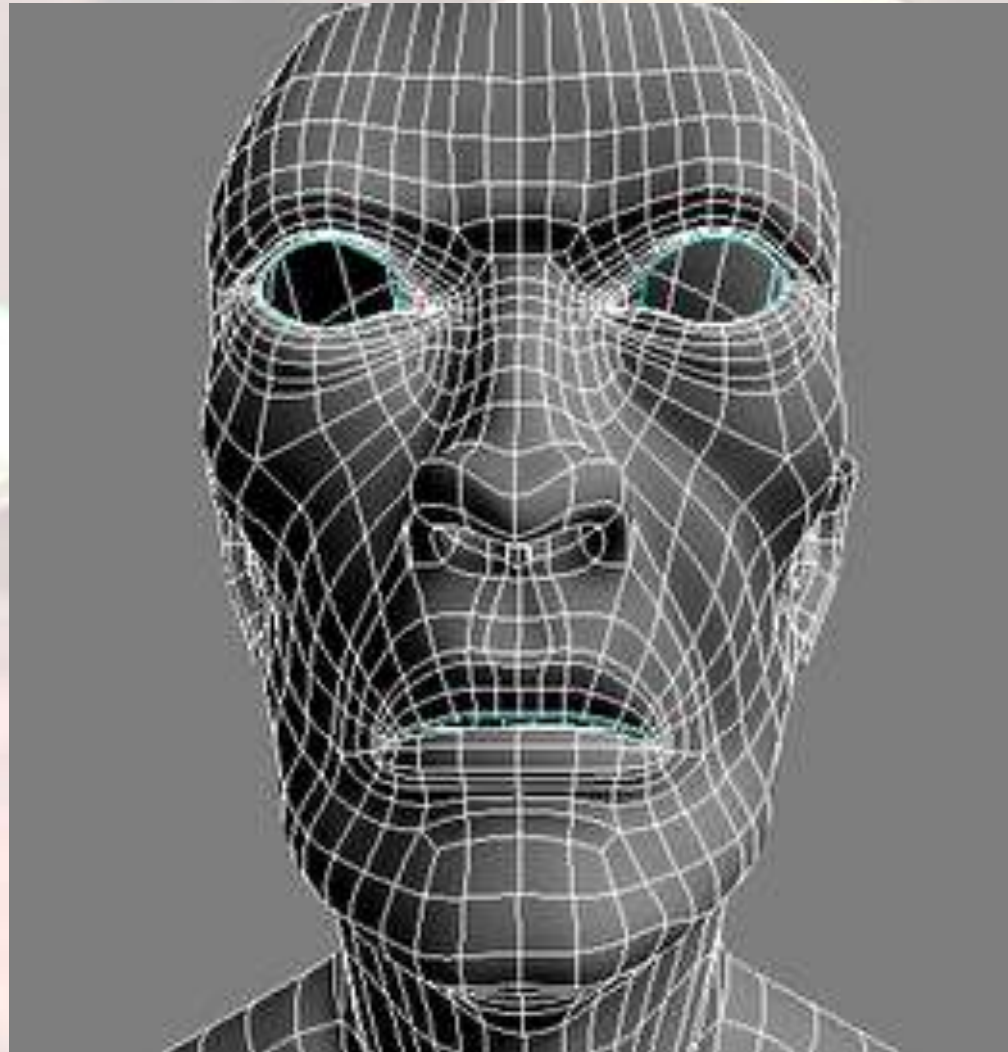
# Drawing Polygons (Class example)

```
glBegin(GL_TRIANGLE_STRIP);  
  glVertex3f(0,0,0);  
  glVertex3f(.5,1,0);  
  glVertex3f(1,0,0);  
  glVertex3f(1.5,.8,0);  
  glVertex3f(2,0,0);  
  glVertex3f(3,1,0);  
glEnd();
```

[Demo Code](#)



# Meshes



# Mesh Types

- Explicit mesh description
  - List of polygonal faces (w/ duplicates)
  - “Polygon soup”
- Indexed Mesh Description
  - List of vertices
  - List of polygons
  - Space efficient



# Mesh Formats

- VRML
- COLLADA
- MODL
- SKN
- Egg (Panda3D)

# Mesh Formats

- Obj (we use in this class)
  - Contains definitions of 1 or more named 3D objects
  - ASCII
  - No compression
- MTL
- A Simple Obj Viewer Can be used to check how the given mesh looks like:  
<http://meshlab.sourceforge.net/>