



# **Computer Graphics (under)**

**Feb., 2014**

# Basic information

- **Instructor**

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- **TA**

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- **Focus**

- **3D graphics: theory and practice**

- **Intro to 3D game and animation technologies**

- **Web pages**

- [cggmwww.csie.nctu.edu.tw](http://cggmwww.csie.nctu.edu.tw) for course materials

- **e3 for discussion**

# Course outline

- **Fixed pipelined graphics**
- **Programmable pipelined graphics**
- **Global illumination**

# Fixed pipelined graphics

- **Rendering pipeline**

- **Input**

- **object mesh, parameters for lighting and viewing, materials (texture maps)**

- **Vertex lighting**

- **View transform**

- **View-volume/back-face culling**

- **Rasterization – polygon shading**

- **Texture mapping**

- **Hidden surface removal by Z-buffer**

- **Write to frame buffer**

# Programmable pipelined graphics

- **GPU**
  - **Pixel shader**
  - **Vertex shader**
  - **Geometry shader**
- **Shader programming**
- **General Purpose GPU (GPGPU)**

# Grading

- **Participation (roll calls will be made)**
  - **No bonus (if there is one) will be given at end if missing more than 3 classes.**
- **Two exam: midterm (18%), final (18%)**
- **Quiz (14%)**
  - **The lowest grade will be dropped (缺考不納入)**
- **Programming assignments (50%)**
  - **3 programs (15+15+20)%**
    - **Possible rendering contest for the 3<sup>rd</sup> assignment**
  - **Policy for late submission**
    - **5% off each day**

# Reference books

## References

- **Interactive computer graphics, Fifth ed., by Edward Angel, Addison Wesley**
- **Fundamentals of Computer Graphics, 2nd ed., By P. Shirley et al., A K Peters**
- **Computer Graphics with OpenGL, 3rd ed, by D. Hearn and M.P. Baker, Prentice Hall, 2004.**
- **OpenGL Programming Guide, 6th ed., by D. Shreiner, M. Woo, J. Neider, and T. Davis, Addison-Wesley**