

# CT 5706701 電腦繪圖與視覺模擬

## Computer Graphics and Visualization

### Time and Place:

Thursday 13:20-16:20 (R6, R7, R8), in IB-602-1/E2-412

### Instructor:

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### Course Website:

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### Course Description:

The computer-based visualization has been a useful tool for engineers in design examination and simulation results presentation. This course focuses on the principles of computer graphics and interactive graphical methods to provide students with basic knowledge of, and practical experience with, the fundamental mathematics, algorithms and representations that are needed to develop interactive computer graphics applications. The programming with advanced graphics packages/interfaces will also be discussed and practiced.

### Topics:

- Display and graphics systems; Color; 2D clipping; Interactive techniques; 3D rendering; 3D clipping and viewing transformation; Perspective projection; GL Pipeline; Hidden line and surface removal; Illumination models; Shading methods; Ray tracing; Computational geometry; Curves and surface; Solid modeling.
- Graphics programming packages/interfaces: **OpenGL, Three.js (WebGL)**.
- State-of-the-art technologies or applications related to computer graphics and visualization (as the selected topics of independent study project).

### References:

No required textbook. Class notes, programming examples, selected articles and handouts will be provided.

JavaScript reference book: (1) Eloquent JavaScript

(2) Secrets of the JavaScript Ninja

OpenGL reference book: OpenGL SUPERBIBLE.

<http://www.starstonesoftware.com/OpenGL/>

### Course Requirements:

1. Programming Project (50%): There will be a final project using the programming packages/interfaces taught in this class. A final demo presentation on your project is required to fulfill the project.
2. Independent Study Project (50%): There will be an independent study project on a selected topic related to computer visualization. A report and a final presentation to present the results of your study are required.