COMP3271

Computer Graphics

First Semester 2019-20

Course Format

- Lectures
  - Time: Tuesdays 9:30am-10:20am
    Fridays 9:30am-11:20am
  - Venue: CB-C
- Tutorials
  - e.g., on OpenGL, assignments

Teaching Team

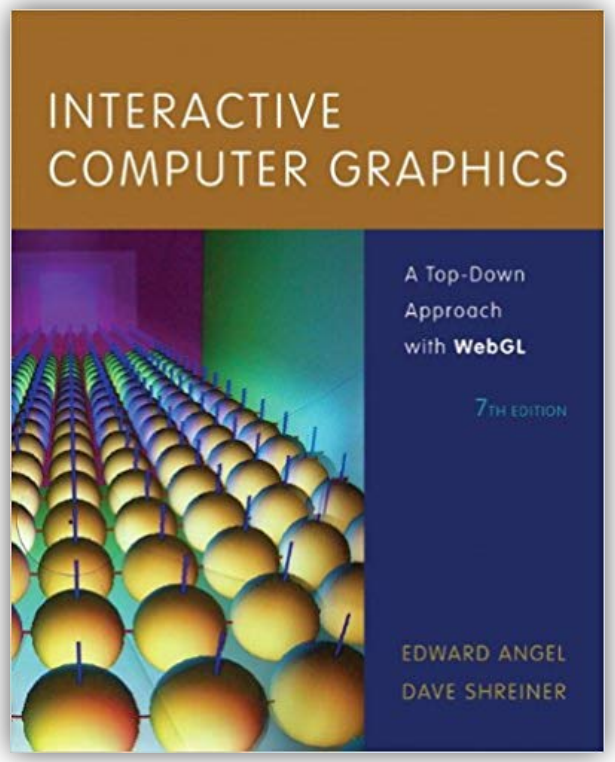
- Instructor
  - **Loretta CHOI Yi-King** (ykchoi@cs.hku.hk, CB322)
    Office Hours: Tuesdays 10:30am-11:30am

- Teaching Assistant
  - **Miss Zhang Wenhua** (whzhang@cs.hku.hk, CB401)
    Consultation Hours: Fridays 10am-12pm

Materials

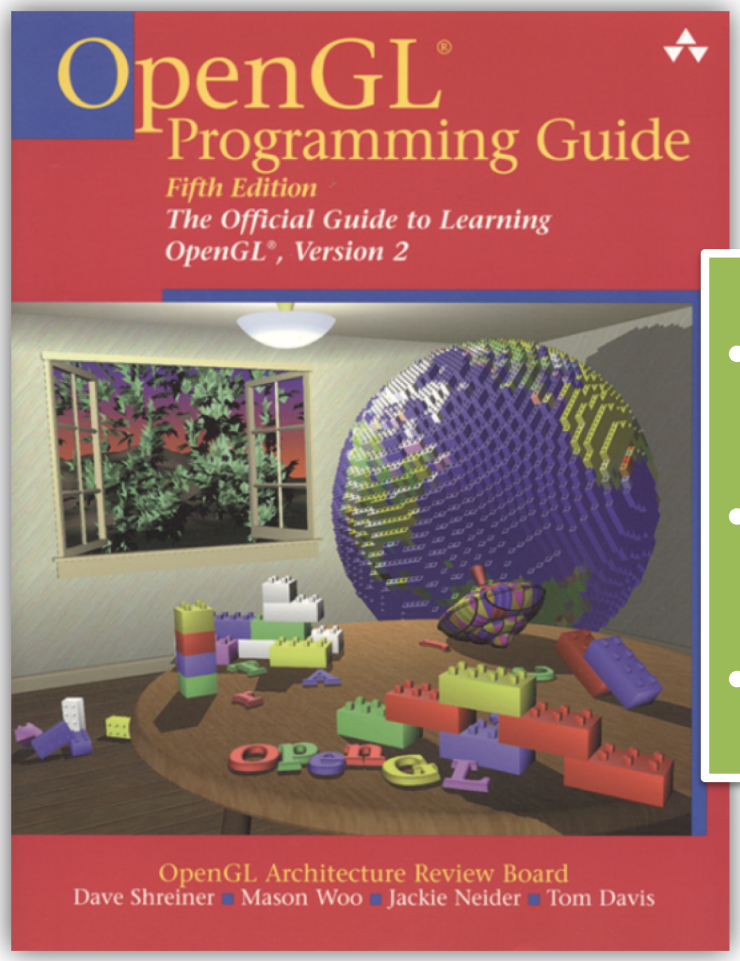
- Lecture Notes
  - Posted on Moodle before the lecture
  - Adapted from notes from Prof. Yu Yizhou's and Prof. Wenping Wang's previous runs of the same course

- Recommended Textbook
  - Interactive Computer Graphics: A Top-Down Approach Using OpenGL/WebGL (6^{th} / 7^{th} Edition)



Materials

- Optional but highly recommended reference
  - OpenGL Programming Guide



- Will use OpenGL in all projects.
- This has a wealth of OpenGL information.
- You will find it very helpful.

Other Resources (Tutorials/Guides)

- OpenGL
  - www.opengl-tutorial.org
  - open.gl
  - learnopengl.com
  - www.opengl.org
- WebGL
  - developer.mozilla.org/en-US/docs/Web/API/WebGL_API

Pre-requisite

- Linear Algebra
  - Euclidean space (vectors)
  - Geometric interpretation (dot product, cross product)
  - Matrics (operations: e.g., addition, multiplication, determinant, inverse)

- Reference:
  - online appendices: “Linear Algebra & Trigonometry” from the book “ Real-Time Rendering” (http://realtimerendering.com)
  - First task: Read Sections A.1, A.2, A.3

Communication Channels

- Discussion Forum (Moodle)
  - Questions regarding lectures, assignments
  - Peer discussions are encouraged
- Email
  - For individual questions or problems that you don't like to discuss in the forum
- Face-to-Face Meeting
  - Talk to the instructor or TA during the consultation hours
  - Make appointment by email for other time slots

Learning Outcome

- **[Computer graphics concepts]** Be able to understand the basic concepts and apply them in analyzing and solving problems.
- **[Computer graphics models]** Be able to understand the meaning and purpose of mathematical models in computer graphics, derive parameters for such models, implement such models in software systems, and apply such models to explain real-world phenomena.
- **[Computer graphics algorithms]** Be able to disseminate and implement computer graphics algorithms, and understand their computing requirements.
- **[Computer graphics tools]** Be able to use 2D and 3D graphics libraries, such as OpenGL, in software development.

Course Outline

- Drawing fractal sets
- 2D primitive drawing algorithms
- Windowing and clipping
- Transformations
- Curves and surfaces
- 3D viewing pipeline
- Hidden surface removal
- Color models
- Surface shading
- Illumination and raytracing

Assessment

- In course assessment [50%]
  - 3 written assignments (10%)
  - 3 programming assignments (40%)
- Final Examination [50%]

- Programming Assignments
  - Interactive Display of 2D Primitives
  - Modeling and Interactive Rendering of 3D Scenes
  - Ray-tracing

Assignments

- Each assignment will take about 2 to 4 weeks to complete. Independent work is expected. Any reuse of code/work by others in your programming assignment must be properly acknowledged. Plagiarism or academic dishonesty will result in disciplinary actions according to departmental policies.
- All assignments must be handed in by the deadlines. Late Policy: 50% deduction if submitting within 24 hours after the deadline; no mark for more than 24 hours late.
- The demonstration of an assignment, if needed, is usually scheduled in the week following the deadline. The TAs will try to finish marking assignments within two weeks after demonstration or hand-in.

Plagiarism Policy

- What is plagiarism?
  - https://tl.hku.hk/plagiarism/
- Departmental policy on handling plagiarism:
  - First Attempt:
    - Students who admit committing plagiarism for the first time shall be warned in writing and receive a zero mark for the component concerned. For those who do not confess, the case would be referred to the Programme Director for consideration.
  - Subsequent Attempt:
    - If students commit plagiarism more than once during the course of studies, the case shall be referred to the Programme Director for consideration. The Programme Director will investigate the case and consider referring it to the University Disciplinary Committee, which may impose any of the following penalties: a published reprimand, suspension of study for a period of time, fine, or expulsion from the University.