Syllabus

COEN 148/290 Computer Graphics
Department of Computer Engineering
Santa Clara University

Dr. Ming-Hwa Wang — Fall Quarter 2007
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Course website: http://www.cse.scu.edu/~mwang2/graphics
Office Hours: Tuesday & Thursday 7:00-7:30pm

Course Description

Raster and vector graphics image generation and representation. Graphics primitives, line and shape generation. Scan conversion anti-aliasing algorithms. Simple transformation, windowing and hierarchical modeling. Interactive input techniques. 3D transformations and viewing, hidden surface removal. Introduction to surface definition with B-spline and Bezier techniques. Surface display with color graphics.

Prerequisites

Abstract Data Types and Data Structures (COEN012). Linear Algebra (MATH245), etc.

Required Textbooks

"Computer Graphics Using Java 2D and 3D", by Y. Daniel Liang and Hong Zhang, Prentice Hall, 2007

References

1. “Introduction to Google SketchUp”, by Aidan Chopra, Laura Town, John Wiley & Sons, 2007
2. “Computer Graphics for Java Programmers, 2nd Edition”, by Leen Ammeraal, Kang Zhang, John Wiley & Sons, 2007
3. "Complete Maya Programming Volume II, An In-depth Guide to 3D Fundamentals, Geometry, and Modeling", by David A. D. Gould, Morgan Kaufmann, 2005
4. "GPU Gems 2: Programming Techniques for High-Performance Graphics and General-Purpose Computation", by Matt Pharr, Randima Fernando, Addison-Wesley, 2005
5. "OpenGL, A Primer, 2nd Edition", by Edward Angel, Addison-Wesley, 2005
6. "Interactive Computer Graphics, A Top-Down Approach Using OpenGL, 4th Edition", by Edward Angel, Addison-Wesley, 2005
7. "OpenGL Programming Guide, The Official Guide to Learning OpenGL, Version 2, 5th Edition", by Dave Shreiner, Mason Woo, Jackie Neider, Tom Davis, Addison-Wesley, 2005
8. “Computer Graphics with OpenGL, 3rd Edition”, by Donald Hearn, M. Pauline Baker, Prentice Hall, 2004
9. "GPU Gems: Programming Techniques, Tips and Tricks for Real-Time Graphics", by Randima Fernando, Addison-Wesley, 2004
10. "OpenGL Reference Manual: The Official Reference Document to OpenGL, Version 1.4, 4th Edition", by Dave Shreiner, Addison-Wesley, 2004
11. "OpenGL Shading Language", by Randi J. Rost, Addison-Wesley, 2004
12. "The Art of 3D Computer Animation and Effects, 3rd Edition", by Isaac V. Kerlow, Wiley, 2004
13. "Tricks of the 3D Game Programming Gurus, Advanced 3D Graphics and Rasterization", by Andre LaMothe, SAMS, 2003
14. "Complete Maya Programming, An Extensive Guide to MEL and C++ API", by David A. D. Gould, ISBN: 1-55860-835-4, Morgan Kaufmann, 2002"Non-Photorealistic Computer Graphics: Modeling, Rendering and Animation", by Thomas Strothotte, Stefan Schlechtweg, Morgan Kaufmann, 2002
15. "Curves and Surfaces for CAGD: A Practical Guide, 5th Edition", by Gerald Farin, Morgan Kaufmann, 2001
16. "Compressed Image File Formats: JPEG, PNG, GIF, XBM, BMP", by John Miano, Addison-Wesley, 1999
17. "Introduction to Computer Graphics", by James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, Richard L. Philips, Addison-Wesley, 1997
18. "The Way Computer Graphics Works", by Olin Lathrop, Wiley, 1997
19. "Computer Graphics, Principles and Practice, 2nd Edition in C", by James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, Addison-Wesley, 1996

Grading Policy

Course grade is determined based on the total score (maximum 950 points + 250 optional bonus points for extra work) from:

- Midterm and Final exams of 200 points each (close book with one A4 note and a calculator.) Makeup exams (must have a very good reason for makeup) are much difficult than normal exams.
- Five programming assignments of 50 points each (late penalty: 10 points/day.) Makeups are more difficult too.
- A group (prefer 2-3 people in a team) programming term project of 300 points (late penalty: 60 points/day.) No makeup is allowed.
- 18 Bonus assignments will be assigned at each lecture with 10 points each. Due before next lecture begin. The solution for bonus assignments will be posted on my protected web page after due. No late work accepted for bonus assignment. 75-80% of exam questions are similar to bonus and/or programming assignments.
- 40 points for class attendance/attitude, and 30 points for lab attendance/attitude, totally subjective.
- Class average targeted at B-.

Table 1: Grade-score table

Score	1000-1200	950-999	900-949	850-899	800-849	750-799	700-749	650-699	0-649
Grade	A	A-	B+	B	B-	C+	C	C-	F

Course Schedule (Tuesday & Thursday 5:15-7:00pm)

Table 2: Course Schedule

#	week	Readings	Remarks
1	9/18 9/20	introduction	Submit due 9/20
2	9/25 9/27	Java	program#1 due 9/25
3	10/2 10/4	event handling	program #2 due 10/2
4	10/9 10/11	math	program #3 due 10/9
5	10/16 10/18	2D/3D	program #4 due 10/16
6	10/23 10/25	geometry	program #5 due 10/23 problem due 10/23 midterm 10/23 group & topic due 10/25
7	10/30 11/1	lighting	paper presentation 10/30 11/1
8	11/6 11/8	texture mapping	proposal due 11/6
9	11/13 11/15	shading	
10	11/19-11/23		academic holidays
11	11/27 11/29	animation	final exam 11/29
12	12/4		project defense 12/4

Reminder

- No cheating, and no register complaint without talking to me first.
- No incomplete. Due date for withdraw is November 30.
- No sit-in or audit the class except formally registered.
- Read files under /home/mwang2/tips for help.
- Handouts, assignments, and solutions will be posted on the web. You should check the class web site at least once a week. You are responsible for printing and bring the handout to the class.
- Put a cover page posted my website on top of each of your submitted written/hardcopy assignment.
- Office hours: Tuesday & Thursday 7:00pm-7:30pm.

Honor Code

All students taking course in the school of engineering agree, individually and collectively, they will neither give nor receive unpermitted aid in examinations or other course work that is to be used by the instructor as a basis of grading.

Disability Accommodation Policy

To request academic accommodations for a disability, students must contact Disability Resources located in The Drahmann Center in Benson, room 214, (408) 554-4111; TTY (408) 554-5445. Students must provide documentation of a disability to Disability Resources prior to receiving accommodations.