Scientific Visualization - Syllabus

General Information:
Course: CS 6/79995, Fall 2008
Time: Tuesday, Thursday 2:15 pm - 3:30 pm  Room: MSB 276

Instructor:
Ye Zhao, Assistant Professor  Office: MSB 220 Email: zhao@cs.kent.edu
Office Hours: Tuesday, Thursday 1:15 pm - 2:15 pm

Goal:
The course discusses the visualization techniques of scientific, medical, and information data sets. We will show how the important human factor will play a significant role in many science, business, health and industry areas.
Topics include: data acquisition of computed, sampled or synthetic data, visual perception, basic graphics and imaging concepts, volume and surface visualization, and information visualization. This course presents introductory as well as some advanced topics on visualization, and students will have the opportunity to further explore an interested topic in a final programming project.

Prerequisite:
Programming skills in C, C++ or java are required. Knowledge of OpenGL is preferred.

Course Syllabus:
Topics covered will include (may be changed):
Introduction to visualization
Graphics and visualization system
  Structure and pipeline
  Programming language
  Graphics hardware and software model
Visual perception
  Eye model and basic perception concept
  Color system
Data model
  1D, 2D and 3D data
  Scalar and vector field
  Data acquisition techniques
2D image data
  Histogram
  Image processing basics
Sampling theory and anti-aliasing
3D volume data
  Spatial transformation
  Ray-casting
  Transfer function
  Illumination and shading
  Isovalue, isosurfaces and surface visualization
Information visualization techniques
  Multiple variant database visualization
  Parallel Coordinates
  Time-varied data set
No single textbook covers all the material of this course. We will make class notes and papers available instead.

We recommend the textbooks below:

Helen Wright, *Introduction to Scientific Visualization*, Springer, 2006


Colin Ware, *Information Visualization: Perception for Design*, Morgan-Kaufman, 1999

Assessment:
No paper examinations for the course.
Grading: Home works: 40%; Programming projects: 40%; Final project and presentation: 20%

Submission:
All programs should conform to the submission standards given in URL
http://www.cs.kent.edu/~zhao/vis08/submission.htm

Notes:
Home works and project submission deadlines are firm. There will be a penalty for late submission. This syllabus and most subsequent information on the course will be available using the WWW. The home page for the course is: www.cs.kent.edu/~zhao/vis08/index.htm

Academic Integrity:
All programs submitted must be your own work, and you are expected to develop your programs independently. You may receive as much help as you wish on the use of the operating system, text editors, debuggers, file transfer protocols and so on. You may consult with other members of the class about interpreting the projects, and you may get help in finding bugs, but not fixing bugs, but you are not allowed to look at or copy another person's code or discuss design decisions with others, and you cannot show your code to others. Students found to be in violation of these guidelines will fail the project, and will be reported to the dean.

Students with Disabilities:
University Policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

Registration Requirement: The official registration deadline for this course is September 7, 2008. University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashFast) prior to the deadline indicated. Registration errors must be corrected prior to the deadline.
Excerpt from the University’s
Administrative policy and procedures regarding student cheating and plagiarism.
Excerpted from University Policy Register #3342-3-07

Cheating and plagiarism constitute fraudulent misrepresentation for which no credit can be given and for which appropriate sanctions are warranted and will be applied.

"Cheat" means intentionally to misrepresent the source, nature, or other conditions of academic work so as to accrue undeserved credit, or to cooperate with someone else in such misrepresentation. Such misrepresentations may, but need not necessarily, involve the work of others. As defined, cheating includes, but is not limited to:

- Obtaining or retaining partial or whole copies of examination, tests or quizzes before these are distributed for student use;
- Using notes, textbooks or other information in examinations, tests and quizzes, except as expressly permitted;
- Obtaining confidential information about examinations, tests or quizzes other than that released by the instructor;
- Securing, giving or exchanging information during examinations;
- Presenting data or other material gathered by another person or group as one's own;
- Falsifying experimental data or information;
- Having another person take one's place for any academic performance without the specific knowledge and permission of the instructor;
- Cooperating with another to do one or more of the above; and
- Using a substantial portion of a piece of work previously submitted for another course or program to meet the requirements of the present course or program without notifying the instructor to whom the work is presented.

Presenting falsified information in order to postpone or avoid examinations, tests, quizzes, or other academic work.

"Plagiarize" means to take and present as one's own a material portion of the ideas or words of another or to present as one's own an idea or work derived from an existing source without full and proper credit to the source of the ideas, words, or works. As defined, plagiarize includes, but is not limited to:

(a) The copying of words, sentences and paragraphs directly from the work of another without proper credit;
(b) The copying of illustrations, figures, photographs, drawings, models, or other visual and nonverbal materials, including recordings, of another without proper credit; and
(c) The presentation of work prepared by another in final or draft form as one's own without citing the source, such as the use of purchased research papers.
ADMINISTRATIVE POLICY AND PROCEDURES REGARDING STUDENT CHEATING AND PLAGIARISM

Condensed Version

For complete policy and procedure go to www.kent.edu/policyregister 3342-3-01.8.

Cheating and plagiarism constitute fraudulent misrepresentation for which no credit can be given and for which appropriate sanctions are warranted and will be applied.

The university affirms that acts of cheating and plagiarism by students constitute a subversion of the goals of the institution, have no place in the university and are serious offenses to academic goals and objectives, as well as to the rights of fellow students.

"Cheat" means to intentionally misrepresent the source, nature, or other conditions of academic work so as to accrue undeserved credit, or to cooperate with someone else in such misrepresentation. Cheating includes, but is not limited to:

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4. Securing, giving or exchanging information during examinations;
5. Presenting data or other material gathered by another person or group as one's own;
6. Falsifying experimental data or information;
7. Having another person take one's place for any academic performance without the specific knowledge and permission of the instructor;
8. Cooperating with another to do one or more of the above;
9. Using a substantial portion of a piece of work previously submitted for another course or program to meet the requirements of the present course or program without notifying the instructor to whom the work is presented; and
10. Presenting falsified information in order to postpone or avoid examinations, tests, quizzes, or other academic work.

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c. The presentation of work prepared by another in final or draft form as one's own without citing the source, such as the use of purchased research papers.

**Academic Sanctions**

The following academic sanctions are provided by this rule for offenses of cheating or plagiarism. Kent campus instructors shall notify the department chairperson and the student conduct office each time a sanction is imposed. Regional campus instructors shall notify the regional campus dean and the student conduct officer each time a sanction is imposed. Regional campus student conduct officer shall notify the Kent student conduct office each time a sanction is imposed by a regional campus instructor. The following academic sanctions are provided by this rule for offenses of cheating or plagiarism. In those cases the instructor may:

1. Refuse to accept the work for credit; or

2. Assign a grade of "F" or zero for the project, test, paper, examination or other work in which the cheating or plagiarism took place; or

3. Assign a grade of "F" for the course in which the cheating or plagiarism took place; and/or;

4. Recommend to the department chair or regional campus dean that further action specified in the rule be taken. The department chairperson or regional campus dean shall determine whether or not to forward to the academic dean or to the vice president for the extended university a recommendation for further sanction under this rule.

**Academic Appeals**

The general principle that applies to the following procedures is that an appeal is directed to the administrative level immediately above the unit from which the appeal emanates.

Appeals are limited to the following reasons:

a. The decision is arbitrary or unreasonable,

b. The decision resulted from a procedural error,

c. The decision is not in accordance with the facts presented,

d. New information is available which may suggest modification of the decision.

For complete policy and procedure go to [www.kent.edu/policyregister 3342-3-01.8](http://www.kent.edu/policyregister 3342-3-01.8).

[http://www.kent.edu/policyreg/chap3/upload/3342.3.01.8.pdf](http://www.kent.edu/policyreg/chap3/upload/3342.3.01.8.pdf)