Course Number: 3460:658
Course Name: Visualization
Course Credits: 3
Schedule: Spring (last offered Spring 2007)

Syllabus Date: October 28, 2007
Prepared By: Dr. Yingcai Xiao

Prerequisites: Completion of 457/557 Introduction to Computer Graphics or permission.

Text:

Bulletin Description:
Visualization pipeline, data representation in visualization, visualization algorithms, object-oriented visualization, scientific visualization, volume visualization, visualization application and research topics.

Detailed Description:
This course covers a wide spectrum of topics in visualization, from basic concepts and algorithms (isosurface and Marching Cubes) to advanced research topics (scattered data visualization and rule-based visualization). Students will learn how to use VKT (the Visualization Toolkit) to write visualization programs.

Course Goals:
After the completion of this course, the student should know the basic concepts and algorithms of visualization, should be able to use a typical visualization library to solve application problems, should have explored the latest advancements in visualization.

Topics (in weeks):
1. Overview (0.5)
2. Graphics Primer (1)
3. Visualization Data Representation (1.5)
4. Visualization Algorithms (2.5)
5. Volume Rendering (1)
6. Advanced Visualization Algorithms (2)
7. Web-based Visualization (1)
8. Scattered Data Visualization (1)
9. Error Analysis in Visualization (1)
10. Rule-based Visualization (1)
11. Information Visualization (1)

Computer Usage:
Five programming assignments and a research-oriented term project.
References:
- Visualization in Biomedical Microscopies, Andres Kriete ed., VCH.
- Data Visualization in Molecular Science: Tools for Insight and Innovation, Jack E. Bowie, editor, and Arthur J. Olson, consulting editor.