CS 419 - Production Computer Graphics

Instructors:

The class is taught by Professor David Forsyth, who is a well known figure in the field of computer vision.

Prerequisites:

The official prerequisite for the course is CS 418, which should be taken prior to taking this class. As with CS 418, it is important to know the basics of Linear Algebra (matrix and vector math); it is also recommended to have a good general understanding of calculus and statistics.

When to Take It:

The class is usually offered only in the spring semester. It is recommended to plan ahead and take CS 418 sometime before taking this. Since this class is the most advanced graphics class offered at the undergraduate level, it is recommended to take this class during the junior or senior year of the undergraduate curriculum.

Class Content:

The topics covered in CS 419 are very different from those covered in CS 418. Whereas CS 418 focuses more on real-time rendering using OpenGL, CS 419 covers topics such as ray tracing, texture synthesis, image analogies, hole filling, 3D reconstruction from multiple images, modeling, and animation. A lot of emphasis is put on ray tracing and related techniques which requires students to understand the concept of integration and statistical sampling. However, students are not required work out any explicit mathematical solutions. Later topics are rather brief overviews of many different areas of graphics research. These topics are largely based on published graphics papers, so this class helps if you are planning to go into computer graphics for graduate school.

Work:

The class does not usually have a midterm exam, but it does have a final. There are 6 MP's throughout the semester. The MP's can all be done in groups except for the first one. The first three MP's require you to build a ray tracer which outputs an image of a scene, and add features to the ray tracer you have built. The fourth MP requires you to pick one of three graphics papers covered in the class and implement a working program using the algorithm presented in the paper. The fifth MP is not really an MP since you just need to use an existing software to insert a virtual object into a video. In the final MP, you also get a choice between 5 different topics covered in the later parts of the class. The MP's are not too bad if you have decent programming experiences and have understood the lectures, but it can get somewhat time consuming to debug due to the time it takes to render your images. Even though you can use any language to implement your MP, it is recommended to use a language with fast execution time (like C++), because more time may be spent waiting for your image to render rather than you writing code.

Life After:

This class is geared towards people who are serious about getting a career in a field related to computer graphics. It teaches you more advanced topics in graphics in case you wanted to go to graduate school or work as a graphics engineer.