CDA 6530: Performance Models of Computers and Networks

Fall 2012

Instructor: Dr. Cliff Zou (HEC 243), 407-823-5015, czou@cs.ucf.edu

Course Time: TuTh 1:30PM - 2:45PM, HEC 110

Office Hour: TuTh 12PM – 1:30PM

Course Webpage: http://www.cs.ucf.edu/~czou/CDA6530/

Prerequisite: Senior standing or graduate student. Knowledge on probability or statistics. Knowledge on a senior-level basic computer networking course. Knowledge on computer programming (C or java).

Description:

This course provides an introduction to the techniques and tools needed to construct and analyze performance models of computer systems and communication networks. Such skills are indispensable for research-related careers. After finishing this course, a student will: (1). Obtain the fundamental theoretical analysis techniques including probability, stochastic and queuing network techniques; (2). Be able to use several useful simulation and modeling tools, such as Matlab and NS2, to conduct basic performance modeling and network simulation tasks; and (3). Understand how to conduct their own performance analysis in the future by learning many classic examples of performance analysis in real-world computer and networking applications.

In order to let students truly learn through this course useful knowledge and techniques in the long term, this course emphasizes on student involvement by focusing on experiments and programming projects. In order not to put heavy workload on students, the course will assign fewer handwritten homework, has no final exam (replaced by term project on experiment and programming), and let 2 students form as one group in most projects.

The tentative outline of this course is:

1. Review of probability and stochastic theory.
2. Basic queuing theory.
3. Performance simulation and modeling tools (such as NS2 and Matlab).
4. Discrete-time and continous-time simulation techniques.
5. Case study of performance evaluation of some real-world applications (such as BitTorrent simulation and evaluation, Internet worm modeling and simulation).

Online Video Streaming:

We will use UCF Tegrity system. Each lecture's video will be posted online about two hours after the corresponding lecture time.

Reference textbooks:

1. Introduction to Probability Models, Ninth Edition by Sheldon M. Ross.
2. Simulation, fouth edition by Sheldon M. Ross.

Grading Policy:

The final grade will use +/- policy, i.e., you may get A, A-, B+, B, B- … grade.

Coursework	Approximate amount	approximate percentage
written homework	2	20%
Programming projects	5	60%
midterm exam	1	20%