CSCI 678: Statistical Analysis of Simulation Models

Spring, 2014
TR 11:00 - 12:20 Jones 307

Instructor: Larry Leemis
Office: Jones 116
Office hours: TR 3:30-5:00, or by appointment

Purpose:

This course introduces students to techniques used in the analysis of simulation models. The first half of the course will be spent on determining appropriate input to a simulation model, and the last half will be spent on analyzing the output from a simulation model. Some preliminary homework assignments on simulation programming will be assigned.

Prerequisites:

Students should have a working knowledge of probability, statistics, and programming.

Textbooks:

Law, A., *Simulation Modeling and Analysis*, Fourth Edition, McGraw-Hill, 2007. ISBN: ISBN 0-07-298843-6.

Chatfield, C., *The Analysis of Time Series: An Introduction*, Sixth Edition, Chapman & Hall/CRC Press, 2004. ISBN: 1-58488-317-0.

Grades:

Course grades will be determined by these weights:

Homework	30%
Midterm	30%
Project	10%
Final Exam	30%

The grading scale for the course will be:

90 - 100 %	A
80 - 90 %	B
70 - 80 %	C

Plus and minus grades may be assigned within each range.

Homework:

A homework set will be assigned weekly.

Project:

Each student will submit a research-oriented semester project on a topic involving a simulation technique. The final report is due on the last day of class. A one-page description of the topic is due by Spring break.

Course outline:

1. Simulation overview
2. Probability and statistics review
3. Input modeling
4. U(0,1) generators
5. Generating random variates
6. Time series analysis
7. Output analysis for a single system
8. Ranking & selection
9. Variance reduction techniques
10. Experimental design, sensitivity analysis, and optimization