CS4237: Systems Modeling & Simulation (2007/08 Semester 1)

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Understanding and Studying System Performance - 3 Fundamental Techniques

◆ **Measurements** of actual systems

◆ **Simulations** using software models

◆ **Mathematical modeling** using such techniques as queuing analysis
Performance Evaluation

Low Complexity and Cost

Rules of Thumb
Trend Analysis
Performance Models
Analytical
Simulation
Measurement

High Complexity and Cost

after-the-fact analysis

CS4237: Systems Modeling and Simulation
CS5233: Simulation and Modeling Techniques
CS5239: Computer System Performance Analysis
CS5271: Performance Analysis of Embedded Systems
Technical Attractions of Simulation*

◆ Ability to compress time, expand time
◆ Ability to control sources of variation
◆ Avoids errors in measurement
◆ Ability to stop and review
◆ Ability to restore system state
◆ Facilitates replication
◆ Modeler can control level of detail

Course Objective

covers the *methodology* and *techniques* in systems modeling and the design of computer simulation models
Course Coverage

Part I – Theory (2/3rd)
◆ Different Approaches to Study a System
◆ Modeling and Simulation Lifecycle
◆ Principles of Discrete-event Modeling & Simulation
◆ Statistical Models in Simulation
◆ Random Number and Random Variates
◆ Input Data Collection and Modeling
◆ Model Verification and Validation
◆ Analysis and Presentation of Results
◆ Comparison and Evaluation of System Design Alternatives

Part 2 – Practice (1/3rd)
◆ Simulation programming in Java
◆ Examples and hands-on in modeling and simulation of computer systems and simulation of computer networks
Books

Recommended Text

Others

Module Assessment

1. Continuous Assessment (60%)
   ◆ Recitation (10%)
   ◆ Test (20%)
   ◆ Assignment/project (30%)

2. Exam (40%)
Everything should be made as simple as possible, but no simpler – attributed to Albert Einstein
Problems

If you're not sure, don't guess... ASK!

Wrong guesses are COSTLY!

- consultation hours, email, catch me after lectures ....