

**CS 736 Software Performance Engineering
Reading List – Spring 2007**

Different methods applied to different application domains

1. F.Aquilani, S.Balsamo, P.Inverardi, “Performance analysis at the software architectural design level”, *Performance Evaluation*, Vol.45, 2001, pp. 147-178.
2. V.Cortellessa, R.Mirandola, “Deriving a Queuing Networks based Performance Model from UML Diagrams”, *2nd International Workshop on Software and Performance*, Ottawa, Canada, 2000, pp. 58-70.
3. D.Menasce, H.Gomaa, “A Method for Design and Performance Modeling of Client/Server Systems”, *IEEE Transactions on Software Engineering*, Vol.26, No.11, November 2000, pp.1066-1085.
4. C.M.Llado, P.G.Harrison, “Performance Evaluation of an Enterprise JavaBean Server Implementation”, *2nd International Workshop on Software and Performance*, Ottawa, Canada, 2000, pp.180-188.
5. J.A.Rolia, K.C.Sevcik, “The Method of Layers”, *IEEE Transactions on Software Engineering*, Vol.21, No.8, August 1995, pp.689-700.
6. C.M.Woodside, J.E.Neilson, D.C.Petriu, S.Majumdar, “The Stochastic Rendezvous Network Model for Performance of Synchronous Client-Server-like Distributed Software”, *IEEE Transactions on Computer*, Vol.44, No.1, January 1995, pp.20-34.
7. D.Petriu, C.Shousha, A.Jalnapurkar, “Architecture-Based Performance Analysis Applied to a Telecommunication System”, *IEEE Transactions on Software Engineering*, Vol.26, No.11, November 2000, pp.1049-1065.
8. G.P.Gu and D.C.Petriu, “XSLT Transformation from UML Models to LQN Performance Models”, *Workshop on Software and Performance (WOSP’02)*, Rome, Italy, 2002, pp. 227-234.
9. Andrea D’Ambrogio, “A Model Transformation Framework for the Automated Building of Performance Models from UML Models”, *Proceedings of the 5th International Workshop on Software and Performance WOSP ’05*, July 2005, pp. 75-86.
10. P.King, R.Pooley, “Derivation of Petri Net Performance Models from UML Specifications of Communication Software”, *TOOLS 2000, LNCS 1786*, pp.262-276.
11. V.Grassi, R.Mirandola, “UML Modeling and Performance Analysis of Mobile Software Architectures”, *UML 2001, LNCS 2185*, 2001, pp.209-224.
12. C.Lindemann, A.Thummler, A.Klemm, M.Lohmann, and O.P.Waldhorst, “Performance Analysis of Time-enhanced UML Diagrams Based on Stochastic Processes”, *Workshop on Software and Performance (WOSP’02)*, Rome, Italy, 2002, pp. 25-34.
13. H.El-Sayed, D.Cameron, M.Woodside, “Automated Performance Modeling from Scenarios and SDL Designs of Distributed Systems”, *Proc. International symposium on Software Engineering in Parallel & Distributed Systems*, April 1998, Kyoto, Japan.

14. R. Hariharan, W.K.Ehrlich, D.Cura, P.K.Reeser, "End to End Performance Modeling of Web Server Architectures", *ACM Performance Evaluation Review*, Vol.28. No.2, September 2000, pp. 57-63.
15. Sugato Bagchi, Eugene Hung, Arun Iyengar, Norbert Vogl, Noshir Wadia, "Capacity planning tools for web and grid environments", *Proceedings of the 1st international conference on Performance evaluation methodologies and tools Valuetools '06*, Oct. 2006.
16. A.Harbitter and D.Menasce, "A Methodology for Analyzing the Performance of Authentication Protocols", *ACM Transactions on Information and System Security*, Vol.5, No.4, 2002, pp. 458-491.
17. S.Chandrasekaran, J.Miller, G.Silver, Arpinar, and A.Sheth, "Performance Analysis and Simulation of Composite Web Services", *International Journal of Electronic Commerce & Business Media*, Vol.13, No.2, 2003, pp.18-30.
18. V. Cortellessa, K. Goseva-Popstojanova, K. Appukutty, A. Guedem, A. Hassan, R. Elnaggar, W. Abdelmoez, and H. H. Ammar, "Model-based Performance Risk Analysis", *IEEE Transactions on Software Engineering*, Vol. 31, No. 1, January 2005.

Software performance patterns & antipatterns

19. Performance Patterns, Chapter 10 of the book *Performance Solutions*, also see J.Merseguer, J.Campos, E.Mena, "A Pattern-Based Approach to Model Software Performance, 2nd International Workshop on Software and Performance, Ottawa, Canada, 2000, pp.137-142.
20. Performance Antipatterns, Chapter 11 of the book *Performance Solutions*, also see C.U.Smith, L.G.Williams, "Software Performance Antipatterns", 2nd International Workshop on Software and Performance, Ottawa, Canada, 2000, pp.127-136.

Software performance measurement

21. M.Ji, E.W.Felten, K.Li, "Performance Measurements for Multithreaded Programs", *ACM SIGMETRICS'98*, Medison, WI, 1998, pp.161-170.
22. J.Dilley, R.Friedrich, T.Jin, J.Rolia, "Measurement tools and Modeling Techniques for Evaluating Web Server Performance", *Proc. Computer Performance Evaluation, LNCS 1245*, June 1997, pp.155-168.
23. G.T.Paixao, W.Meira Jr., V.A.F.Almeida, D.A.Menasce, A.M.Pereira, "Design and Implementation of a Tool for Measuring the Performance of Complex E-commerce Sites", *TOOLS 2000, LNCS 1786*, 2000, pp.309-323.
24. Cristian Coarfa, Peter Druschel, Dan S. Wallach, "Performance analysis of TLS Web servers", *ACM Transactions on Computer Systems (TOCS)*, Vol. 24, No. 1, Feb 2006, pp. 39-69.
25. K.P.Gummadi, R.J.Dunn, S.Saroiu, S.D.Gribble, H.M.Levy, and J.Zahorjan, "Measurement, Modeling, and Analysis of Pear-to-Pear File-Sharing Workload", *ACM Symposium on Operating Systems Principles (SOSP'03)*, Bolton Landing, New York, 2003, pp.314-329.

26. M.Harkema, D.Quartel, B.M.M.Gijsen, R.D. van der Mei, “Performance Monitoring of Java Applications”, *Workshop on Software and Performance (WOSP’02)*, Rome, Italy, 2002, pp.114-126.
27. P. Barham, R. Isaacs, R. Mortier, and D. Narayanan, “Magpie: Real-Time Modeling and Performance-Aware Systems”, *Workshop on Hot Topics in Operating Systems*, Lihue, Hawaii, June 2004.
28. Albert M. Lai, Jason Nieh, “On the Performance of Wide-area Thin-client Computing”, *ACM Transactions on Computer Systems (TOCS)*, Vol. 24 No. 2, May 2006, pp. 175-209.

Software performance testing

29. D.Grossman et al, “Performance Testing a Large Finance Application”, *IEEE Software*, Vol.13.No.5, September 1996, pp.50-54.
30. E.J.Weyuker, F.I.Vokolos, “Experience with Performance Testing of Software Systems: Issues, an Approach, and Case Study”, *IEEE Transactions on Software Engineering*, Vol.26, No.12, December 2000, pp.1147-1156.
31. A.Avritzer, J.Kondek, D.Liu, and E.J.Weyuker, “Software Performance Testing Based on Workload Characterization”, *Workshop on Software and Performance (WOSP’02)*, Rome, Italy, 2002, pp. 17-24.
32. B.M.Subraya, S.V.Subrahmanya, “Object Driven Performance Testing of Web Applications”, *Proc. 1st Asia-Pacific Conference on Quality Software*, 2000.

Workload characterization

33. M.Calzarossa, G.Serazzi, “Workload Characterization: A Survey”, *Proceedings of the IEEE*, Vol.81, No.8, August 1993, pp.1136-1150.
34. M.Arlitt, “Characterizing Web User Sessions”, *ACM Performance Evaluation Review*, Vol.28. No.2, September 2000, pp. 50-56.
35. M.Zari, H.Saiedian, M.Naeem, “Understanding and Reducing Web Delays”, *IEEE Computer*, Vol.34, No.12, December 2001, pp.30-37.
36. M. Andreolini, V. Cardellini, and M. Colajanni, “Benchmarking Models and Tools for Distributed Web-Server Systems”, *Performance 2002*, M.C. Calzarossa and S. Tucci (Eds.), LNCS 2459, 2002, pp. 208-235.

Experimental topics that provide hands-on experience in using performance monitoring utilities. Study the corresponding topics below. Write a survey paper or set up an experiment for performance measurement.

37. UNIX system monitors: *iostat* (terminal and disk I/O activity, CPU utilization), *vmstat* (statistics about process, virtual memory, disk, trap and CPU activity), *sar* (system activity reporter), *netstat* (network status).

38. Performance monitoring tools for Windows operating systems
<http://msdn2.microsoft.com/en-us/library/ms950390.aspx>

39. Performance monitoring tools for Linux operating system
K. Yaghmour and M. R. Dagenais, “Measuring and Characterizing System Behavior Using Kernel-Level Event Logging”, *Proceedings of 2000 USENIX Annual Technical Conference*, San Diego, CA, June 2000.

40. Program monitoring: *GNU gprof*
<http://www.gnu.org/software/binutils/manual/gprof-2.9.1/gprof.html>

Policies for the term paper / project report and in class presentation

Each student is expected to develop a term paper / project report and presentation and e-mail them to the instructor by the April 13. Acceptable formats are

- PDF (preferable), postscript, or Word for the paper
- PDF or Power Point for the presentation.

The late assignments are strongly discouraged and will be penalized 10% for each day late.

Term paper / project report

The term paper/project report will usually emerge from the topics in the reading list. The papers from the reading list will be available at the reserve desk in Evansdale Library from Monday, February 12. Students are expected to independently search for additional references, read them and summarize the topic in typically 10 – 15 pages (font 12, 1.5 interline spacing).

Students should choose the topic from the reading list and send an e-mail to the instructor by March 1.

- If the project topic includes running an experiment the project report should also include the experimental results, and a section on problems encountered and lessons learned during the experiment.
- Alternatively, students may propose different topic in which the concepts taught in the class will be applied. A brief summary of the proposed topic should be send to the instructor by March 1. The topic and the scope are subject to an approval by the instructor.

Term paper/project reports will be evaluated and will contribute approximately 25% of the final grade.

In class presentation

Each student is required to give in class presentation of the term paper/project. These presentations will be scheduled for the last four weeks of the semester.

- The presentation schedule including the links to the presentations will be available on the class Web page.
- The allotted time for each presentation is 25 minutes. This allotment includes time for Q&A, therefore please allow at least 5 minutes for discussions.

The presentations will be evaluated and will contribute approximately 10% of the final grade.

Academic Honesty

Students are encouraged to discuss project topics between themselves. However, each student should develop the term paper/project report and the presentation individually. The term paper/project report must be written entirely in student's own words, and all figures and factual information must be properly cited. Text copied from a book, paper or Internet source must be clearly marked as a quote and include the citation to the source. Evidence to the contrary will be dealt with in accordance with the Lane Department of CSEE academic dishonesty policy.