

Human-directed Approaches to Computer Systems Problems

Reading List

Note: We will not read all of these papers in class. The syllabus is the final word on the specific papers that we shall read in class.

Most of these papers are available from the web (use <http://scholar.google.com> and <http://citeseer.ist.psu.edu> to find them. I will make photocopies of the older, non-web papers available as needed.)

Useful Books

- R. Jain, *The Art of Computer Systems Performance Analysis*, Wiley, 1991. The introduction to statistics, hypothesis testing, etc is particularly useful in the context of this course.
- L. Golnick, et al, *The Cartoon Guide to Statistics*, 1994.
- S. Card, T. Moran, A. Newell, *The Psychology of Human-Computer Interaction*, Lawrence Erlbaum Publishers, 1986.
- M. Lamming, W. Newman, *Interactive System Design*, Addison Wesley, 1995.
- P. Huber, *Robust Statistics*, Wiley, 2003.
- B. Toganazzini, *Tog on Interface*, Addison-Wesley, 1992.
- M. Kuniavsky, *Observing the User Experience: A Practitioner's Guide to User Research*, Morgan Kaufmann, 2003.
- R. Proctor, T. Van Zandt, *Human Factors in Simple and Complex Systems*, Allyn and Bacon, 1993
- D. Olsen, *Developing User Interfaces*, Morgan Kaufman, 1998.
- R. Bryant, D. O'Hallaron, *Computer Systems: A Programmer's Perspective*, Prentice Hall, 2003.

Reading and Writing

Efficient Reading of Papers in Science and Technology:

<http://www.cs.columbia.edu/~hgs/netbib/efficientReading.pdf>

How to Give a Good Research Talk (and related topics):

<http://research.microsoft.com/Users/simonpj/papers/giving-a-talk/giving-a-talk.htm>

The Big Picture

1. P. Dinda, G. Memik, R. Dick, B. Lin, A. Mallik, A. Gupta, S. Rossoff, *The User In Experimental Computer Systems Research*, Proceedings of the Workshop on Experimental Computer Science (ExpCS 2007), June, 2007.
2. B. Lin, *Human-driven Optimization*, Doctoral Dissertation, Technical Report NWU-EECS-07-04, Department of Electrical Engineering and Computer Science, Northwestern University, July, 2007
3. B. Lin, A. Gupta, P. Dinda, *Measuring, Understanding, and Exploiting Direct User Input in Resource Scheduling*, DRAFT
4. A. Jaime, N. Sebe, D. Gatica-Perez, *Human Centered Computing: A Multimedia Perspective*, ACM Multimedia 2006.

Outside of Systems

5. L. von Ahn, M. Blum, N. Hopper, J. Langford, *CAPTCHA: Using Hard AI Problems for Security*, Eurocrypt 2003. Also be sure to check out captcha.net and recaptcha.net
6. L. von Ahn, *Google Talk on Human Computation*, Google Video: <http://video.google.com/videoplay?docid=-8246463980976635143&q=luis+von+ahn&pr=goog-sl>
7. L. von Ahn, *Games With A Purpose*, IEEE Computer, 39:6, June 2006.
8. L. von Ahn, L. Dabbish, *Labeling Images with a Computer Game*, CHI 2004.
9. P. Dourish, *Evolution in the adoption and use of collaborative technologies*, 1999.
10. A. MacLean, et al, *User-tailorable Systems: Pressing the Issues with Buttons*, CHI 1990.

Workload Modeling And Benchmarking That Incorporates The User

11. S. Bhola, M. Ahamad, *Workload modeling for highly interactive applications*, SIGMETRICS 1999. Extended version is Technical Report GIT-CC-99-2, College of Computing, Georgia Tech. Read the extended version

12. Y. Endo, Z. Wang, J. Chen, M. Seltzer, *Using latency to evaluate interactive system performance*, OSDI 1996.
13. Y. Endo, and M. Seltzer, *Improving Interactive Performance using TIPME*, SIGMETRICS 2000.
14. B. Sabata, et al, *Taxonomy for QoS Specifications*, WORDS 1997.
15. R. Balan, *Simplifying Cyber Foraging for Mobile Devices*, MobiSys 2007.
16. B. Chen, et al, *The Measured Performance of Personal Computer Operating Systems*, ACM TOCS 14:1, 1996.
17. A. Balachandran, *Characterizing User Behavior and Network Performance in a Public Wireless LAN*, SIGMETRICS 2001.
18. T. Henderson, S. Bhatti, *Modeling User Behavior in Network Games*, ACM Multimedia 2001.

Measuring The User

19. A. Gupta, B. Lin, P. Dinda, *Measuring And Understanding User Comfort With Resource Borrowing*, Proceedings of the 13th IEEE International Symposium on High Performance Distributed Computing (HPDC 2004)
20. J. Klein, *Computer response to user frustration*, Master's thesis, Massachusetts Institute of Technology, 1999.
21. C. Reynolds, *The sensing and measurement of frustration with computers*, Master's thesis, MIT Media Lab, 2001.
22. A. Komatsubara, *Psychological upper and lower limits of system response time and user's preference on skill level*, HCI International 1997
23. D. Embley, G. Nagy, *Behavioral aspects of text editors*,. ACM Computing Surveys 13, 1 (January 1981), 33-70.
24. M. Whang, *The Emotional Computer Adaptive To Human Emotion*, Probing Experience From Assessment of User Emotions and Behavior to Development of Products, J. Westerink, et al, eds, 2008.
25. R. Mandryk, M. Atkins, *A fuzzy physiological approach for continuously modeling emotion during interaction with play technologies*, Journal of Human-Computer Studies, 65 (2007), 329-347.
26. W. Tetzlaff, *State Sampling of Interactive VM/370 Users*, IBM Systems Journal 18(1), 1979.
27. D. Olshefski, *Inferring Client Response Time at the Web Server*, SIGMETRICS 2002.
28. E. Kiciman, B. Livshits, *AjaxScope: A Platform for Remotely Monitoring the Client-side Behavior of Web 2.0 Applications*, SOSP 2007.

Predicting The User's Behavior

29. C. Zilles, *Increasing Interactivity By Predicting User Actions*, ASPLOS 2004 "Wild and Crazy Ideas" Session (WACI)

30. B. Davison, H. Hirsh, *Predicting Sequences of User Actions*, AAAI-98/ICML-98 Workshop on Predicting the Future: AI Approaches to Time Series Analysis.
31. B. Davison, *Learning Web Request Patterns*, Book Chapter in *Web Dynamics: Adapting to Change in Content, Size, Topology and Use*, 2004.
32. P. Gorniak, D. Poole, *Predicting Future User Actions by Observing Unmodified Applications*, AAAI 2000.

Remote Display And Speculation

33. T. Richardson, Q. Stafford-Fraser, K. Wood, A. Hopper, *Virtual network computing*, IEEE Internet Computing 2, 1 (January/February 1998).
34. M. Chapman, *rdesktop: A remote desktop protocol client for accessing windows nt terminal server*. <http://www.rdesktop.org>.
35. P. Romano, *Itu-t recommendation t.128 (application sharing)*, Tech. rep., ITU, March 1997.
36. Microsoft., *Remote desktop protocol (rdp) features and performance*. Tech. rep., 2000.
37. A. Lai, J. Nieh, *Limits of wide-area thin-client computing*, SIGMETRICS 2002.
38. R. Barratto, L. Kim, J. Nieh. *Thinc: A virtual display architecture for thin-client computing*, SOSP 2005.
39. B. Schmidt, et al, *The Interactive Performance of SLIM: A Stateless Thin-client Architecture*, SOSP 1999.
40. S. Rossoff, and P. Dinda, *Prospects for Speculative Remote Display*, Technical Report NWU-EECS-06-08, Department of Electrical Engineering and Computer Science, Northwestern University, August, 2006,
41. J. Lange, P. Dinda, S. Rossoff, *Experiences with Client-based Speculative Remote Display*, DRAFT

User-Driven Power Management

42. K. Flautner., T. Mudge, *Vertigo: Automatic Performance-setting for Linux*, OSDI 2002.
43. J. Lorch, A. Smith, *Using User Interface Event Information in Dynamic Voltage Scaling Algorithms*, Technical Report UCB/CSD-02-1190, Computer Science Division, EECS, University of California at Berkeley, August (2002).
44. G. Theocharous, et al, *Machine learning for adaptive power management*, Intel Technology Journal 10, 4 (Nov. 2006).
45. L. Yan, L. Zhong, N. Jha, *User-perceived Latency based Dynamic Voltage Scaling for Interactive Applications*, DAC 2005.
46. A. Mallik, B. Lin, G. Memik, P. Dinda, and R. Dick, *User-Driven Frequency Scaling*, Computer Architecture Letters, Volume 5, Number 2, July-December, 2006.

47. B. Lin, A. Mallik, P. Dinda, G. Memik, R. Dick, *Power Reduction Through Measurement and Modeling of Users and CPUs: Summary*, Proceedings of ACM SIGMETRICS 2007, June, 2007. Read the full technical report instead: NWU-EECS-06-11.
48. A. Mallik, J. Cosgrove, R. Dick, G. Memik, P. Dinda, *PICSEL: Measuring User-Perceived Performance to Control Dynamic Frequency Scaling*, ASPLOS 2008.
49. K. Flaurner, S. Reinhardt, T. Mudge, *Automatic Performance Setting for Dynamic Voltage Scaling*, MOBICOM 2001.
50. [blind draft], *Learning and Leveraging the Relationship Between Architecture-level Measurements and Individual User Satisfaction*, BLIND DRAFT

User-Driven Scheduling And Resource Management

51. J. Sousa, R. Balan, V. Poladian, D. Garlan, M. Satyanarayanan, *Giving users the steering wheel for guiding resource-adaptive systems*. Tech Rep. CMU-CS-05-198, Department of Computer Science, Carnegie Mellon University, December 2005.
52. B. Lin, P. Dinda, *Towards Scheduling Virtual Machines Based On Direct User Input*, Proceedings of the 1st International Workshop on Virtualization Technology in Distributed Computing (VTDC 2006), November, 2006. Read the full version, Northwestern Technical Report NWU-EECS-06-07.
53. B. Lin, P. Dinda, D. Lu, *User-driven Scheduling of Interactive Virtual Machines*, Proceedings of the Fifth International Workshop on Grid Computing (Grid 2004).
54. B. Lin, and P. Dinda, *VSched: Mixing Batch and Interactive Virtual Machines Using Periodic Real-time Scheduling*, Proceedings of ACM/IEEE SC 2005 (Supercomputing), November, 2005

Visualization

55. R. Dhamija, *Hash Visualization in User Authentication*, CHI 2000.
56. A. Perrig, D. Song, *Hash Visualization: A New Technique to Improve Real-World Security*, CRYPTEC 1999.
57. P. Ren, Y. Gao, Z. Li, Y. Chen, B. Watson, *IDGraphs: Intrusion Detection and Analysis Using Stream Compositing*, IEEE Computer Graphics and Applications, 26:2, March-April, 2006. (whole issue is about visualization in cybersecurity)
58. Genetic Art for Intrusion Detection Project: <http://ga-ids.cs.northwestern.edu>

General Reference

1. B. Lampson, *Hints for Computer System Design*, ACM SIGOPS 15:5, October, 1983.
2. J. Salzer, et al, *End-to-end Arguments in System Design*, ACM TOCS 2:4, 1984.

Humorous

3. The SCIGen Automatic CS Paper Generator and the story behind it, <http://pdos.csail.mit.edu/scigen/>