P. Krishnan

Curriculum Vitæ

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Areas of Interest

Design and implementation of algorithms, IP network and service management, IP networking, World Wide Web, caching and prefetching, mobile computing, databases and operating systems, data compression.

Education

Ph.D. in Computer Science. Brown University, Providence, RI, May 1995. Thesis title: "Online Prediction Algorithms for Databases and Operating Systems." Advisor: Prof. Jeffrey S. Vitter.

Sc.M. in Computer Science. Brown University, Providence, RI, May 1991.

B. Tech in Computer Science and Engineering. Indian Institute of Technology, Delhi, India, 1989. Ranked 2nd in class.

Work Experience

June 1995–present. Member of Technical Staff, Bell Laboratories, NJ. Research in Network and Service Management. (Bell Laboratories was called AT&T Bell Laboratories until January 1996.)

June–September 1994. Summer at AT&T Bell Laboratories, NJ.

December 1993–January 1994. Consultant, Matsushita Information Technology Laboratories (MITL), NJ.

June–September 1993. Summer at MITL, NJ.

February 1993–May 1995. Visiting Research Scholar, Duke University.

September 1989–May 1993. Research and Teaching Assistantships at Brown University.

May–July 1988. Internship at Applied Electro Magnetics, New Delhi, India.

Publications

Journal Publications

[1] R. Kravets and P. Krishnan. "Application-Driven Power Management for Mobile Communication," to appear in ACM/URSI/Baltzer Wireless Networks (WINET) special issue of best papers from MOBICOM '98.

[2] P. Krishnan, P. Long, and J. S. Vitter. "Adaptive Disk Spindown via Optimal Rent-to-Buy in Probabilistic Environments," in *Algorithmica* **23(1)**, January 1999, pp. 31–56.

[3] P. Krishnan and J. S. Vitter. "Optimal Prediction for Prefetching in the Worst Case," in *SIAM J. on Computing*, **27:6**, December 1998, pp. 1617–1636. (This is an expanded version of [19].)

[4] P. Krishnan and B. Sugla. "Utility of Cooperating Web Proxy Caches," in the *Elsevier J. on Computer Networks and ISDN Systems* **30**, 1998, pp. 195–203. (This appears in the *Proceedings of the 1998 World Wide Web Conference.*)

[5] D. Goodman, P. Krishnan and B. Sugla. "Minimizing Queuing Delays and Number of Messages in Mobile Phone Location," in the *ACM/Baltzer J. on Mobile Networks and Applications*, **1:1**, 1996, pp. 39–48.

[6] J. S. Vitter and P. Krishnan. "Optimal Prefetching via Data Compression," in *J. of the ACM*, **43:5**, September 1996. (This is an expanded version of [23].)

[7] F. Douglis, P. Krishnan and B. Bershad. "Adaptive Disk Spindown Policies for Mobile Computers," in *Computing Systems*, **8:4**, 1995. (This is an expanded version of [17].)

Refereed (Conference) Publications

[8] R. Kravets and P. Krishnan. "Power Management Techniques for Mobile Communication," in *Proceedings of the 1998 ACM/IEEE International Conference on Mobile Computing and Networking*, (MOBICOM '98).

[9] P. Krishnan, D. Raz, Y. Shavitt. "Transparent En-route Cache Location in Regular Network Topologies," DIMACS Workshop on Robust Communication Networks: Interconnection and Survivability, November 1998.

[10] R. Kravets, K. Calvert, P. Krishnan, and K. Schwan. "Adaptive Variation of Reliability," in *Proceedings of the 1997 High Performance Networking Conference* (HPN '97).

[11] P. Krishnan, J. S. Vitter and B. Iyer. "Estimating Alphanumeric Selectivity in the Presence of Wildcards," in *Proceedings of the 1996 ACM SIGMOD International Conference on Management of Data*, Montreal, Canada, June 1996, pages 282–293.

[12] D. Goodman, P. Krishnan and B. Sugla. "Design and Evaluation of Paging Strategies for Personal Communications," in *Proceedings of the Conference on Multiaccess, Mobility and Teletraffic for Personal Communications*, B. Jabbari, P. Godlewski and X. Lagrange eds., Kluwer, Paris, France, May 1996, pages 131–144.

[13] P. Krishnan, S. Nag and B. Sugla. "An Automated Technique for Designing and Improving Provisioning Processes," in *Proceedings of the 1996 IEEE/IFIP Network Operations and Management Symposium (NOMS)*, Kyoto, Japan, April 1996, pages 329–338.

[14] B. Awerbuch, Y. Azar, E. F. Grove, M. Y. Kao, P. Krishnan and J. S. Vitter. "Load Balancing in the L_p Norm," in *Proceedings of the 36th Annual IEEE Symposium on Foundations of Computer Science*, Milwaukee, WI, October 1995.

[15] E. Grove, M. Kao, P. Krishnan and J. S. Vitter. "Online Perfect Matching and Mobile Computing," in *Lecture Notes in Computer Science:955, Proceedings of the 4th International Workshop on Algorithms and Data Structures*, Kingston, Ontario, August 1995.

[16] P. Krishnan, P. M. Long and J. S. Vitter. "Learning to Make Rent-to-Buy Decisions with Systems Applications," in *Proceedings of the 12th International Conference on Machine Learning,* July 1995.

[17] F. Douglis, P. Krishnan and B. Bershad. "Adaptive Disk Spindown Policies for Mobile Computers," in *Proceedings of the Second USENIX Symposium on Mobile and Location-Independent Computing*, April 1995.

[18] F. Douglis, R. Cáceres, F. Kaashoek, P. Krishnan, K. Li, B. Marsh and J. Tauber. "Storage Alternatives for Mobile Computers," in *Mobile Computing*, Chapter 18, Imielinski and Korth eds., Kluwer, 1995.

[19] P. Krishnan and J. S. Vitter. "Optimal Prediction for Prefetching in the Worst Case," in *Proceedings of the 5th Annual ACM-SIAM Symposium on Discrete Algorithms*, January 1994.

[20] F. Douglis, P. Krishnan and B. Marsh. "Thwarting the Power Hungry Disk," in *Proceedings of the 1994 Winter USENIX Conference*, San Francisco, January 1994.

[21] B. Marsh, F. Douglis and P. Krishnan. "Flash Memory File Caching for Mobile Computers," in *Proceedings of the 27th Hawaii Conference on Systems Sciences*," IEEE, January 1994.

[22] K. Curewitz, P. Krishnan and J. S. Vitter. "Practical Prefetching via Data Compression," in *Proceedings of the 1993 ACM SIGMOD International Conference on Management of Data*, Washington, D.C., May 1993.

[23] J. S. Vitter and P. Krishnan. "Optimal Prefetching via Data Compression," in *Proceedings of the 32nd Annual IEEE Symposium on Foundations of Computer Science*, San Juan, Puerto Rico, October 1991.

Other Publications

[24] P. Krishnan, D. Raz, Y. Shavitt. "The Cache Location Problem," submitted for journal publication.

[25] P. Krishnan, T. Naik, and R. Sequeira. "Sequencing of Configuration Operations for IP Networks," to be submitted.

[26] S. Das, P. Krishnan, S. Mazumdar, T. Naik, G. Ramu, B. Sugla, G. K. Swanson. "IP Network Configurator: Information Model and Architecture," in preparation.

[27] P. Krishnan, D. Raz, and Y. Shavitt. "Transparent En-route Caching in WANs?," Work in progress presentation at the Fourth International Web Caching Workshop, March 1999.

[28] B. Sugla and P. Krishnan. "IP Network Configurator: Advancing the State of the Art in IP Network Deployment and Operations," whitepaper, November 1998.

[29] P. Krishnan and B. Sugla. "PROXYMAN: Proxy Caching Manager With Advanced Features," in *Lucent Netdays 97*, September 29–October 1, 1997.

[30] P. Krishnan and B. Sugla. "Proxy Caching Manager With Enhanced Features," Bell Laboratories, Restricted Document, August 1996.

[31] P. Krishnan. "Online Prediction Algorithms for Databases and Operating Systems," Ph. D. thesis, Brown University, Providence, RI, May 1995.

[32] P. Krishnan, F. Douglis and B. Marsh. "StoreSim: A Storage Sub-System Simulator," Matsushita Information Technology Lab. Technical Report MITL-TR-103-94, Confidential.

Patents

1. P. Krishnan, S. Mazumdar, T. Naik, G. Ramu. "Method to Sequence Changes for IP Network Configuration," filed, October 1999 (provisionally filed, April 1999).

2. P. Krishnan, D. Raz, Y. Shavitt. "Methods to Place Caches in a Wide Area Network," filed, March 1999.

3. P. Krishnan, D. Raz, B. Sugla. "Firewall Optimization and Management," filed, January 1999.

4. P. Krishnan and B. Sugla. "Technique For Effectively Managing Proxy Servers In Intranets," filed, November 1998.

5. "Adaptive Disk Spin-down Method for Managing the Power Distributed to a Disk Drive in a Laptop Computer," (with F. Douglis, B. Marsh and B. Bershad), United States Patent 5,493,670, issued February 20, 1996.

6. "Online Background Predictors and Prefetchers for Locality Management," (with J. S. Vitter and K. M. Curewitz), United States Patent 5,485,609, issued January 16, 1996.

7. "Method for Managing the Power Distributed to a Disk Drive in a Laptop Computer," (with F. Douglis and B. Marsh), United States Patent 5,481,733, issued January 2, 96.

Awards

1. The 1999 Bell Labs President Silver Award for the IP Network Configurator project. (I was the project leader.)

2. IBM Fellowship, 1994–1995.

3. Merit prizes and certificates for academic excellence at the Indian Institue of Technology, Delhi, India.

4. National Talent Scholarship from the Government of India, 1983–1988.

5. Junior Science Talent Scholarship from the Government of India, 1981–1983.

Professional Activities

- **Program Committee Member**, the upcoming *2001 Symposium on Applications and the Internet*, (SAINT 2001), San Diego, January 2001.

- **Program Committee Member**, the upcoming *2000 World Wide Web Conference*, (WWW 2000), Amsterdam, May 2000.

- **Program Committe Member**, the *1999 USENIX Symposium on Internet Technologies and Systems* (USITS '99), Boulder, October 1999.

- **Program Committee Member**, the *1999 World Wide Web Conference*, (WWW '99), Toronto, May 1999.

- **Program Committee Member**, the *Lucent Network Management Symposium*, Bell Labs, Holmdel, 1998.

- **Referee/Reviewer.**

  - **Journals.** Algorithmica, ACM Journal on Wireless Networks, Information and Computation, Theoretical Computer Science, Application of Discrete Programming in Computer Science, Transactions for Knowledge and Data Engineering, American Mathematical Letters.

– **Conferences.** World Wide Web Conference, USENIX Annual Technical Symposium, Usenix Symposium on Internet Technology and Systems, USENIX Symposium on Experiences with Distributed and Multiprocessor Systems (SEDMS), IEEE INFOCOM, IEEE Symposium on Foundations of Computer Science (FOCS), ACM Symposium on Theory of Computation (STOC), ACM SIGMETRICS, ACM-SIAM Symposium on Discrete Algorithms (SODA), ACM Conference on Information and Knowledge Management (CIKM).

- Ph.D. thesis committee member for Robin Kravets, Georgia Tech. University.