

NITIN GARG

905 W. MIDDLEFIELD ROAD #988, MOUNTAIN VIEW, CA 94043
(415) 310-7741

NITIN@CS.PRINCETON.EDU

CAREER OBJECTIVE

Looking for an industry position involving design and implementation of systems and applications that address specific needs and contribute to the bottom line. The ideal position would be one that utilizes my technical skills while also providing new learning opportunities.

EDUCATION

Ph.D. in Computer Science, Princeton University, Princeton NJ (September 2006).

Thesis: *A Postal System Based Digital Network And A Distance Learning Application*.

Supervised by Prof. Randolph Y. Wang.

B.Tech. in Computer Science and Engineering, IIT Bombay (May 2000).

Honors Thesis: *Multi-Topic Document Classification*.

Supervised by Prof. Soumen Chakrabarti.

EMPLOYMENT

Visiting Scholar, Computer Science Dept., University of Washington, (June 2006 – Present)

Research Intern, Microsoft Research Labs India, Bangalore, India (Summer 2005).

Research Intern, Sun Microsystems Research Labs, Mountain View, CA (Summer 2004).

Research Intern, HP Systems Research Labs, Mountain View, CA (Summer 2003).

Research Assistant, Department of Computer Science, Princeton University ('01 – '04, '05 – '06).

Teaching Assistant, Department of Computer Science, Princeton University ('00 – '01, '04 – '05).

Research Intern, IBM Research Labs India, New Delhi (Summer 1999).

TECHNICAL EXPERTISE

Languages: Proficient in C, Java, Python, Shell Scripts. Familiar with C++, JavaScript, SQL, Perl.

Environments: Proficient with Linux and Unix-like OS.

SELECTED PROJECTS

Project: The Postmanet system

Contribution: This was my dissertation topic and I was involved with all aspects of its design and implementation. Specifically, I designed and implemented the pnet0 and PHTTP subsystems.

Synopsis: The Postmanet system is a network that uses discs mailed in the postal system as the underlying transport layer. There are a number of regions which currently do not have access to conventional connectivity and there are number of applications which are constrained by the capacity of conventional connectivity. The Postmanet system addresses this gap by exploiting the “high latency, high bandwidth” nature of the postal system. The key challenges that the system must address are: 1) providing a convenient API that abstracts away the underlying details, such as handling lost or damaged discs in mail, while allowing exploitation of Postmanet specific traits, such as utilizing both the “postal link” as well as the “conventional link” where available. 2) Provide “overlay routing” over the postal system. The default postal system “routing”

provides point-to-point communication between any two parties but that results in inefficient use of resources within the network as well as require end-points to process a disc for each end-point it is talking to. For challenge (1) we developed two different APIs. PHTTP is a browser-based API that provides support for building web-based services on top of the Postmanet and pnet0, which is an alternate lower-level message-passing API that provides greater control to developers (as an example, it allows greater visibility and control over whether the “postal link” or the “conventional link” is being used for a certain operation). Pnet0 is a more generic interface that is suited for applications that don’t conform to the web-based service model. For challenge (2), we have developed and evaluated several heuristics based approaches ranging from pure “P2P” routing between participating nodes to infrastructure-based approaches with specialized “P-Centers” embedded in the network that perform “gather-scatter” operations.

Project: Segank and personalRAID

Contribution: PersonalRAID: Worked on the implementation of the kernel block device module that implements a user-space callback, allowing the system to run in user-space. I did the performance evaluation of the system. Finally, I also contributed in the design of the system. Segank: I was the lead on the project for its design as well as its implementation.

Synopsis: The growing trend of devices increasingly containing embedded storage has led to users having their data increasingly spread over a multitude of devices, such as laptops, desktops, PDAs, cell phones etc. As the data gets more and more distributed, it is increasingly unfeasible for users to manually move, synchronize and manage their data. The Segank and PersonalRAID projects aim to address this issue. PersonalRAID assumes a disconnected environment (i.e., it assumes no network connectivity is present) and relies on the user carrying a small portable storage device (such as a USB keychain dongle). A PersonalRAID system running on a user’s devices presents itself as a single log-structured disk. Segank, unlike PersonalRAID, does not discount the presence of a network connection and strives to provide a single coherent storage abstraction in a distributed mobile setting. The challenge for the system is to guarantee freshness of data as well as locating and fetching it on reads. The key to the solution is a “write log” that gets propagated to all devices lazily to reclaim space and a “Segankast” mechanism to locate and fetch the latest copy of a block.

PUBLICATIONS

- N. Garg, S. Sobti, J. Lai, F. Zheng, K. Li, A. Krishnamurthy, and R. Wang. Bridging the digital divide: storage media + postal network = generic high-bandwidth communication. *ACM Transactions on Storage*, Volume 1, Issue 2. May 2005.
- R. Wang, S. Sobti, N. Garg, E. Ziskind, J. Lai, and A. Krishnamurthy. Turning the Postal System into a Generic Digital Communication Mechanism. *Proc. of ACM SIGCOMM 2004*. August 2004.
- J. Lai, E. Ziskind, F. Zheng, Y. Shao, C. Zhang, M. Zhang, N. Garg, S. Sobti, R. Wang, and A. Krishnamurthy. Distance Learning Technologies for Basic Education in Disadvantaged Areas. *The 8th Global Chinese Conference on Computers in Education*. **(Award paper.)** June 2004.
- S. Sobti, J. Lai, Y. Shao, N. Garg, C. Zhang, M. Zhang, F. Zheng, A. Krishnamurthy and R. Wang. Network-Embedded Programmable Storage and Its Applications. *Proc. 3rd IFIP-TC6 Networking Conference (NETWORKING 2004)*. May 2004.
- S. Sobti, N. Garg, F. Zheng, J. Lai, Y. Shao, C. Zhang, E. Ziskind, A. Krishnamurthy, and R. Y. Wang. Segank: A Distributed Mobile Storage System. *Proc. Third Conference on File and Storage Technologies*. March 2004.
- Fengzhou Zheng, Nitin Garg, Sumeet Sobti, Chi Zhang, Russell E. Joseph, Arvind Krishnamurthy, Randolph Y. Wang. Considering the Energy Consumption of Mobile Storage Alternatives. *Proc. IEEE Symposium on Modeling, Analysis and Simulation of Computer Systems*. October 2003.

J. Zedlewski, S. Solti, N. Garg, F. Zheng, A. Krishnamurthy, and R. Wang. Modeling Hard-Disk Power Consumption. *Proc. Second Conference on File and Storage Technologies*. March 2003.

S. Solti, N. Garg, C. Zhang, X. Yu, A. Krishnamurthy, and R. Y. Wang. PersonalRAID: Mobile Storage for Distributed and Disconnected Computers. *Proc. First Conference on File and Storage Technologies*. January 2002.

REFERENCES

References available on request.