

Curriculum Vitae

Ashok Anand

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Citizenship: India
Visa Status: F1

Education

2007-Present:

PhD Candidate

Computer Science, University of Wisconsin, Madison
GPA 4.0/4.0
Advisor: Prof. Aditya Akella
Area: Networking and Systems

May 2003:

B Tech.

Computer Science and Engineering, IIT-Kharagpur
Department Rank 8/55
GPA 9.13/10

Work Experience

Research Assistant with advisor *Prof. Aditya Akella*, Jan'08 – present.

My research work has focused on pushing redundancy elimination capability as primitive network service accessible to all applications, protocols and users. I have shown the benefits of universally deploying packet-level redundant content elimination as primitive IP-layer service on each network router (**SIGCOMM 2008**). I have prototyped the packet-level redundancy elimination mechanism on Click-based software router, that can run at 2.4 Gbps. Currently, I am looking into developing ways for extracting maximum benefits of redundancy elimination while effectively utilizing resources on network devices. I am also looking into developing a system for fast key insertion and lookup leveraging Flash SSDs; such a system can significantly increase the benefits provided by WAN optimizers, and can have several other applications.

Summer Intern, Microsoft Research Lab, India. May – Aug'08.
Mentor: Dr. Ramachandran Ramjee.

I worked on supporting redundancy elimination on end-hosts and evaluating its benefits for enterprise networks. My studies had argued for end-hosts based RE (redundancy elimination) and shown that RE in enterprise networks can be quite beneficial towards reducing bandwidth usage and increasing application throughput. Our paper on this work has been accepted in **SIGMETRICS 2009**, and we are further exploring the design and implementation issues for end-hosts based RE.

Technical Staff Member, IBM Research Lab, India, June'03 – July'07.

Manager: Dr. Manish Gupta.

Mentor: Dr. Pradeep Varma.

I was involved in design and development of a prototype *Iquilt*, for managing distributed service oriented architecture (SOA) based applications and platforms. I also worked on building an eclipse-based prototype *DAT*, for automating the porting of C/C++ programs from one platform to another. I also worked on developing storage placement algorithms in parallel disks.

Summer Intern, INRIA Research Lab, France, May – June'02.

Mentor: Isabelle Astic.

I worked on implementing unified MIB (Management Information Base) for IPv4 and IPv6 network management into net-snmp-5.0.3 module of the net-snmp package, on FreeBSD.

Referred Publications

Ashok Anand, Aditya Akella, Chitra Muthukrishnan and Ramachandran Ramjee. **Redundancy in Network Traffic: Findings and Implications.** *To appear in SIGMETRICS/Performance 2009.*

Ashok Anand, Sayandeep Sen, Andrew Krioukov, Florentina Popovici, Aditya Akella, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau and Suman Banerjee. **Avoiding File System Micromanagement with Range Writes.** In *8th USENIX Symposium on Operating Systems Design and Implementation (OSDI, 2008).*

Ashok Anand, Archit Gupta, Aditya Akella, Srinivasan Seshan and Scott Shenker. **Packet Caches on Routers: The Implications of Universal Redundant Traffic Elimination.** In *Proceedings of the ACM SIGCOMM 2008 Conference on Applications, Technologies, Architectures, and Protocols for Computer Communications.*

Akshat Verma and Ashok Anand, **On Store Placement for Response Time Minimization in Parallel Disks.** In *26th IEEE International Conference on Distributed Computing Systems (ICDCS 2006).*

Pradeep Varma, Ashok Anand, Donald P. Pazel and Beth Tibbitts. **NextGen eXtreme Porting: Structured by Automation.** In *Proceedings of the 2005 ACM Symposium on Applied Computing (SAC, 2005).*

Akshat Verma and Ashok Anand, **General Store Placement for Response Time Minimization in Parallel Disks.** In *Journal of Parallel and Distributed Computing (JPDC, 2007).*

Posters

Manish Sethi and Ashok Anand. **On Concurrency Improvements in Enterprise SOA Middleware.** To appear in *ACM/IFIP/USENIX 9th International Middleware Conference (Middleware, 2008)*.

Manish Sethi, Ashok Anand, Venkateswara Reddy Madduri, Manish Gupta and Dipayan Gangopadhyay, **An open framework for federating integrated management model of distributed IT environment.** In *IEEE/IFIP Network Operations and Management Symposium (NOMS, 2008)*.

Donald P. Pazel, Pradeep Varma, Amit M. Paradkar, Beth Tibbitts, Ashok Anand and Philippe Charles. **A Framework and Tool for Porting Assessment and Remediation,** In *20th International Conference on Software Maintenance (ICSM 2004)*

Patents

US Patent 7469375 – Systems and methods for managing error dependencies. Issued on 23rd December, 2008; Ashok Anand, Amit M. Paradkar, Donald P. Pazel, Beth Tibbitts and Pradeep Varma

US Patent 7472377 - Systems and methods for determining software package identity during a system build. Issued on 30th December, 2008; Ashok Anand, Philippe Charles, Amit M. Paradkar, Donald P. Pazel, Beth Tibbitts and Pradeep Varma

Deploying Redundancy Elimination on Routers: Algorithms and Applications to Traffic Engineering. *Provisional filed;* Aditya Akella, Ashok Anand and Srinivasan Seshan

System and Method for placement of logical data stores to minimize response time. *Filed on 13th Jan 2007;* Akshat Verma and Ashok Anand

Computer Skills

Languages: C/C++, Java, Perl, XML, Prolog, BPEL, UML, Lex

Tools and Packages: Eclipse, Click, Websphere Integration Developer, Prolog, ABLE

Academic Awards and Achievements

All India Rank 186, (TOP 0.15%) in Indian Institutes of Technology, Joint Entrance Examination, out of approx. 1, 25, 000 candidates appeared.

IBM Research Division Technical Group Award, for *contribution to DAT project.*

IBM Research Invention Achievement Award, for *contribution to patent invention activities*

Nominated for Microsoft Research Fellowship 2009 (one among 34 candidates selected for final interview)