

Mayur Deshpande

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Summary

Designer and developer of wide-area, large-scale distributed systems, with *expertise in Peer-to-Peer content distribution*. Ability to conceptualize, design, implement, and optimize high-performance protocols.

Skills

- Designing elegant and high-performance protocols for wide-area network (WAN) content-distribution using TCP/IP or UDP/IP
- Developing scalable, distributed systems (client-server, peer-to-peer) with expertise in event-driven, asynchronous/ synchronous, single/multi threaded design and implementation
- Implementing systems using CORBA (ACE+TAO, ICE) middleware
- Building systems with Java/C/C++ on Linux, FreeBSD & Windows

Education

Ph.D.	Information and Computer Science,	UCI,	06/02 - 06/07	GPA: 3.93
M.S.	Information and Computer Science,	UCI,	06/99 - 06/02	GPA: 3.96
M.Sc. (Hons)	Information Systems, BITS Pilani, India,		06/93 - 06/97	GPA: 3.64

Work Experience

Research Assistant DSM LAB University of California, Irvine 6/03 - Present

Flashback: Peer-to-Peer Browser-Web-Server for Handling Flash Crowds

- Developed and deployed a complete P2P web-server system, Flashback, that is capable of cutting web-server bandwidth by a **factor of 10**
- Flashback scales linearly in end-user delay with exponentially increasing web-traffic, even with constant outgoing web-server bandwidth
- Implemented a completely decentralized P2P NAT-hole-punching protocol over UDP
- Implemented NOIS (Non Overlapping Interval Skiplist) for $O(\log(n))$ maintenance (addition, deletion) and search of intervals

RapID: A Peer-to-Peer System for Disseminating Earthquake Shakemaps

- Designed and Implemented a P2P dissemination system, RapID, using ICE middleware for distribution of earthquake shake-maps to emergency response organizations
- RapID is the first TCP-based gossip-based protocol for content dissemination
- RapID disseminates small content (images) twice as fast as current state-of-art content distribution protocols, such as BitTorrent
- Built a WAN emulator capable of supporting 250 virtual nodes in real-time using Modelnet software on 15 IBM e-server blades running Debian Linux and SystemImager cluster management software

Design and implementation of Composable Middleware, Compose|Q

- Designed and implemented the core-engine of an Actor-based middleware, Compose|Q
- Designed and implemented RPC mechanism over asynchronous actor primitives
- Designed and implemented actor state-migration across network nodes

Research Assistant DOC LAB University of California, Irvine 6/00 - 6/03

Increasing Scalability of CORBA middleware

- Designed, implemented, tested and released as open-source, the first server-side asynchronous method handling mechanism (AMH) for CORBA.
- AMH solves the problem of stack-blowup on server-side due to large number of long standing requests on middle-tier servers and improves throughput by over 10% as compared to synchronous threading designs

Intern Los Angeles Emergency Preparedness Department, Los Angeles 6/05 - 8/05

- Observed and analyzed the functioning of emergency response, with emphasis on rapid information dissemination

Intern Science Applications International Corporation, Washington D.C. 6/01 - 8/01

- In depth analysis of middleware for a wide-area distributed battleground simulator

Software Engineer Daimler-Chrysler Research Center, Bangalore, India 7/97 - 5/99

- Design and implementation of UDP network protocol for a ship navigation system

Undergraduate Students Mentored

Abhishek Amit Sophomore, part-time at Google Implementing NOIS and optimizing Flashback

Mason Chang Senior Designing browser functionality for Flashback

Samuel Mandell Graduated , at Microsoft Implementing an iPaq P2P “Push-to-talk” app

Teaching Experience

Teaching Assistant University of California, Irvine Winter’03 and Winter’06

Senior-level course in Operating Systems

- Held weekly discussion sessions for 30+ class-sizes. Responsibilities included teaching practical applications of learned concepts and designing class programming projects
- Presented a lecture to 100+ students on the underlying OS concepts in my research

Select Publications

[1] Mayur Deshpande, Abhishek Amit, Mason Chang, Nalini Venkatasubramanian. and Sharad Mehrotra. *Flashback: A Peer-to-Peer WebServer for Flash Crowds*. International Conf on Distributed Computing Systems (ICDCS). 2007.

[2] Mayur Deshpande, Bo Xing, Iosif Lazardis, Bijit Hore, Nalini V. and Sharad Mehrotra. *CREW: A Gossip-based Flash-Dissemination System*. International Conf on Distributed Computing Systems (ICDCS). 2006.

[3] Mayur Deshpande, and Nalini Venkatasubramanian. *The Different Dimensions of Dynamicity*. International Conference on Peer-to-Peer Systems (P2P). 2004.

[4] Mayur Deshpande, Douglas C. Schmidt, Carlos O’Ryan and Darrell Brunsch. *Design and Performance of Asynchronous Method Handling for CORBA*. Distributed Objects and Applications (DOA). 2002.

[5] Nalini Venkatasubramanian, Mayur Deshpande, Shivajit Mohapatra, Sebastian Gutierrez-Nolasco and Jehan Wickramasuriya. *Design and Implementation of a Composable Reflective Middleware Framework*. ICDCS 2001