

AMIT MONDAL

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Objective

A full-time position in the field of Computer Science, with emphasis on Systems/Networking.

Education

Ph.D. Computer Science, Northwestern University, June, 2010

- Dissertation: *Transport and Application Layer Approaches to Improve end-to-end Performance in the Internet.*

M.S. Computer Science, Northwestern University, June, 2007 (GPA: 4.0/4.0)

B.S. Computer Science and Engineering, IIT Kanpur, India, May 2004 (GPA: 7.9/10.0)

Industry Experience

Microsoft Research, Redmond, Washington

Research Intern

June 2008 to September 2008

Contractor

April 2009 to June 2009

- Developed a distributed measurement framework to collect packet traces of emulated VoIP and video conferencing traffic using C# on .NET platform.
- Analyzed packet traces to quantify the impact of various network components on audio/video conferencing performance.

HP Labs, Palo Alto, California

Research Intern

July 2007 to September 2007

- Designed a framework to find routes that meet individual QoS metrics efficiently and scalably under multiple QoS constraints.
- Built a functional prototype in C++ on UNIX.

Hughes Software Systems, Gurgaon, INDIA

Software Engineer

June 2004 to July 2005

- Incorporated High Speed Downlink Packet Access (HSDPA) protocol in 3G network stack.

Research Experience

Northwestern Network Group, Northwestern University, Evanston, Illinois

Research Assistant

August 2005 to present

- Designed a DoS-resilient TCP stack to mitigate large scale poisoning attacks in the Internet.
- Investigated application and transport layer techniques to improve response times of thin-stream TCP applications.
- Challenged the need of exponential backoff mechanism in TCP through large-scale simulations, analytical modeling, and Emulab experiments.
- Investigated issues in adding ECN capabilities in TCP SYN/ACK packets, and quantified its advantage using simulations.
- Developed a methodology and toolchain to understand how various network characteristics affect user irritation.
- Studied the feasibility of an innovative DoS attack to disrupt Internet routing.

Teaching Experience

EECS Department, Northwestern University, Evanston, Illinois

Teaching Assistant

September 2006 to December 2007

- Provided in-class support to undergraduate engineering students (Linear Algebra, Intro. to C++, Data Structure, Embedded Systems Design and Analysis).

- Graded homework and programming assignments.
- Mentored multiple undergraduate students in their class projects.

Selected Course Projects

Implemented TCP/IP stack for Minet simulator (Winter, 2006)
Developed remote procedure call (RPC) library for UNIX (Spring, 2006)
Implemented kernel memory allocation algorithms in UNIX (Fall, 2005)
Implemented ext-2 file system in UNIX (Fall, 2005)
Incorporated IEEE 802.11 MAC protocol in NS-2 simulator (Summer, 2003)
Built a ALGOL compiler using Lex, Yacc and C (Winter, 2002)

Technical Skills

Extensive software experience in networking and information technology.

Programming: C, C++, C#, Perl, Python, Tcl/tk, UNIX shell scripting, SQL

Protocols: TCP/IP, UDP, MPI, OpenMP, IPC, RPC, HTTP

Packages: MATLAB, NETWORK SIMULATOR 2, CLICK MODULAR ROUTER, NETFLOW

Network Experiment Testbed: PLANETLAB, EMULAB

Honors and Awards

Murphy Fellowship, Northwestern University, EECS Dept., 2005-06

NSF student conference travel grant for SIGCOMM 2006, Pisa, Italy

Among top 0.005% students out of 150,000 candidates appearing in IIT-JEE, 2000

Ranked 11 amongst 100,000 candidates appearing for State level Engineering Entrance Exam, 2000

Patents

P. Sharma, A. Mondal and S. Banerjee. "Flow Path Discovery in Network to Guarantee Multiple Metric QoS Constraints", US Patent application filed, June, 2008.

Selected Publications

1. A. Mondal, C. Huang, M. Jain, Jin Li, and A. Kuzmanovic. "SureCall: Characterizing IP Networks for Real-time Audio/Video Conferencing". Under submission.
2. J. Miller, A. Mondal, R. Potharaju, P Dinda, and A. Kuzmanovic. "Network Monitoring is People: Understanding End-user Perception of Network Problems". Under submission.
3. A. Mondal, P. Sharma, S. Banerjee, and A. Kuzmanovic. "Supporting Application Network Flows with Multiple QoS Constraints". *In Proceedings of IEEE IWQoS 2009*, Charleston, SC, July 2009
4. A. Kuzmanovic, A Mondal, S. Floyd, and K.K. Ramakrishnan. "Adding Explicit Congestion Notification (ECN) Capabilities to TCP's SYN/ACK Packets". RFC 5562, June 2009
5. A. Mondal and A. Kuzmanovic. "Upgrading Mice to Elephants: Effects and End-Point Solutions". *In IEEE/ACM Transactions on Networking*, to appear, March 2009
6. A. Mondal and A. Kuzmanovic. "Removing Exponential Backoff from TCP". *In ACM SIGCOMM Computer Communication Review*, October 2008
7. A. Mondal and A. Kuzmanovic. "A Poisoning-Resilient TCP Stack". *In Proceedings of IEEE ICNP 2007*, Beijing, China, October 2007
8. A. Mondal and A. Kuzmanovic. "When TCP Friendliness Becomes Harmful". *In Proceedings of IEEE INFOCOM 2007*, Anchorage, Alaska, May 2007

Professional References

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