Nick Feamster

Assistant Professor

College of Computing
Klaus Advanced Computing Building
Georgia Institute of Technology
266 Ferst Drive, Room 3348
Atlanta, GA 30332-0765, USA

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EDUCATIONAL BACKGROUND

Degree	Year	University	Field
Ph.D.	2005	Massachusetts Institute of Technology Cambridge, MA *Dissertation:* Proactive Techniques for Correct and Predictable Internet Routing *Sprowls Honorable Mention for best MIT Ph.D. dissertation in computer science* *Advisor:* Hari Balakrishnan Minor in Game Theory	Computer Science
M.Eng.	2001	Massachusetts Institute of Technology Cambridge, MA *Dissertation:* Adaptive Delivery of Real-Time Streaming Video *Advisor:* Hari Balakrishnan *William A. Martin Memorial Thesis Award* (MIT M.Eng. thesis award)	Computer Science
S.B.	2000	Massachusetts Institute of Technology Cambridge, MA	Electrical Engineering and Computer Science

EMPLOYMENT HISTORY

Title	Organization	Years
Assistant Professor	Georgia Institute of Technology	*2006–Present*
Postdoctoral Research Staff	Princeton University	*Fall 2005*
Research Assistant	Massachusetts Institute of Technology	*2000–2005*
Intern/Consultant	AT&T Labs–Research	*2001–2005*
Technical Associate	Bell Laboratories	*1999*
Intern	Hewlett-Packard Laboratories	*1999*
Technical Staff	LookSmart, Ltd.	*1997*

CURRENT FIELDS OF INTEREST

My research focuses on networked computer systems, with a strong emphasis on network architecture and protocol design; network security, management and measurement; routing; and anti-censorship techniques. The primary goal of my research is to help network operators run their networks better, and to enable users of these networks (both public and private) to experience high availability and good end-to-end performance. I have a strong interest in tackling practical problems using a "first principles" approach, designing systems based on these principles, and implementing and deploying these systems in practice.

I. TEACHING

A. Courses Taught

Quarter/Year	Course Number & Title	Number of Students	Comments
Spring 2006	CS 7260 Internetworking Protocols and Architectures	27	New Syllabus
Fall 2006	CS 7001 Introduction to Graduate Studies	76	New Syllabus
Fall 2006	CS 8001 Networking Research Seminar	30	New Syllabus
Fall 2006	CS 1100 Freshman Leap Seminar	15	
Spring 2007	CS 7260 Internetworking Protocols and Architectures	55	

Guest lecture for MIT Course 6.829 (Computer Networking) in Fall 2005.
Multiple guest lectures for CS 4251 (Computer Networks II) in Spring 2006.
Guest lecture for CS 3251 (Computer Networks I) in Fall 2006.

B. Curriculum Development

CS 7260 Internetworking Architectures and Protocols: *Spring 2006.* Developed a new project-based graduate course with substantial programming assignments using a wide variety of state-of-the-art networking software tools and platforms (*e.g.*, rcc, PlanetLab, scriptroute, NetFlow, etc.). Contributed questions to a larger bank of questions also used in graduate-level networking courses at Carnegie Mellon and MIT. Developed 24 new lectures, many based on current "hot topics" in computer networking (*e.g.*, spam, botnets, traffic anomaly detection, etc.)

Spring 2007. Developed two new course modules: (1) sound techniques for network measurement; and (2) evaluation platforms (Emulab, VINI, etc.). Developed new problem sets on these topics. With faculty at Carnegie Mellon, instituted the use of a cross-institutional online forum for paper discussion. Students read papers from the CS 7260 syllabus and comment on papers before class to help stimulate paper discussion; students also read the discussion blog and can comment on papers being discussed in networking classes at other schools.

CS 7001 Introduction to Graduate Studies: With Professor Alex Gray, I have developed a new course syllabus and structure to CS 7001 around the larger goal of introducing new students to *how to do great research* as soon as their first term at Georgia Tech. In contrast with previous terms, where CS 7001 consisted of faculty "advertisements" for their research and projects consisted of short "mini-projects" where little research could be accomplished in a short time span of 3 weeks, we have improved the syllabus by bringing in faculty members to talk about research philosophy, exciting new directions, etc. We have also given the students the option to do a research project that is a term-long project in conjunction with CS 8903; our goal is to give students the flexilibty to select meaningful research problems based on their research assistantships while helping them learn the skills required for writing papers, finding and evaluating research ideas, and performing other tasks associated with doing great research.

C. Individual Student Guidance

C.1. Ph.D. Students Supervised

Anirudh Ramachandran   College of Computing
> *Spring 2006 - Present*
> *Research on network-level behavior of spammers and passive botnet detection.*

Yiyi Huang   College of Computing
> *Spring 2006 - Present*
> *Co-advised with Jim Xu. Research on fast, distributed network anomaly detection.*

Murtaza Motiwala   College of Computing
> *Fall 2006 - Present*
> *Research on (1) in-band troubleshooting and (2) scalable network architectures for path diversity.*

Nadeem Syed   College of Computing
> *Spring 2007 - Present*
> Co-advised with Alex Gray. Developing and implementing new machine learning techniques for fast disruption detection.

C.2.   Masters Students Supervised

Winston Wang   M.I.T. EECS
> *Fall 2002 - Spring 2003*
> *Thesis on an implementation of the Infranet anti-censorship system received MIT's Charles and Jennifer Johnson Thesis Prize.*

Chris Kelly   College of Computing
> *Fall 2006 - Present*
> Developing new software features for the Campus-Wide Performance Monitoring and Recovery (CPR) project.

Manas Khadilkar   College of Computing
> *Fall 2006 - Present*
> Research on efficient settings of lease times for DHCP address allocation. Algorithm in development, to be used on the Georgia Tech campus network for optimizing lease time settings.

Han Lu   College of Computing
> *Fall 2006*
> Research on spam traffic patterns by IP address space, to study the persistence of spamming IP addresses.

Samantha Lo   Hong Kong Polytechnic University
> *Spring 2007 - Summer 2007*
> Research on market-based network architectures and inbound traffic engineering.

C.3.   Undergraduate Students Supervised

Hongyi Hu   M.I.T. EECS
> *Spring 2005 - Fall 2005*
> Extensions to the *rcc* router configuration checker tool for static configuration analysis of internal routing protocol configurations.

C.4.   Special Projects

Daniel Mentz   College of Computing
> *Spring 2006 - Summer 2006*
> Research on campus network security troubleshooting.

Buddy Moore   College of Computing
> *Summer 2006*
> Implemented distributed version of the Infranet anti-censorship software. Publicly available.

Amit Khanna   College of Computing
Fall 2006
Implemented Secure BGP (S-BGP) in the Quagga software router. Software publically available and operators are using the codebase for ongoing work on certificates for secure routing.

Bhairav Dutia   College of Computing
Fall 2006
Research on anti-censorhip techniques and countermeasures.

Megan Benoit   College of Computing
Fall 2006
Research on spammers' email address harvesting practices.

Sagar Mehta   College of Computing
Fall 2006 - Present
Research on anti-phishing techniques.

II. RESEARCH AND CREATIVE SCHOLARSHIP

A. Theses

A.0.1   Nick Feamster. *Proactive Techniques for Correct and Predictable Internet Routing*. PhD thesis, Massachusetts Institute of Technology, February 2006. Winner of the MIT George M. Sprowls Honorable Mention for Best MIT Ph.D. Dissertation in Computer Science.

A.0.2   Nick Feamster. Adaptive delivery of real-time streaming video. Master's thesis, Massachusetts Institute of Technology, May 2001. Winner of the MIT EECS William A. Martin Memorial Thesis Award.

B. Journal Publications

B.0.1   Nick Feamster and Jennifer Rexford. Network-Wide Prediction of BGP Routes. *IEEE/ACM Transactions on Networking*, June 2007. *To Appear*.

B.0.2   Nick Feamster, Ramesh Johari, and Hari Balakrishnan. Stable Policy Routing with Provider Independence. *IEEE/ACM Transactions on Networking*, 2007. *To appear*.

B.0.3   Nick Feamster, Jaeyeon Jung, and Hari Balakrishnan. An Empirical Study of "Bogon" Route Advertisements. *ACM Computer Communications Review*, 35(1):63–70, November 2004.

B.0.4   Nick Feamster, Jay Borkenhagen, and Jennifer Rexford. Guidelines for Interdomain Traffic Engineering. *ACM Computer Communications Review*, 33(5):19–30, October 2003.

C. Refereed Conference Publications

C.0.1   Yiyi Huang, Nick Feamster, Anukool Lakhina, and Jim Xu. Exposing Routing Problems with Network-Wide analysis. In *Proc. ACM SIGMETRICS*, San Diego, CA, June 2007.

C.0.2   Christopher P. Lee, Keshav Attrey, Carlos Caballero, Nick Feamster, Milena Mihail, and John A. Copeland. MobCast: Overlay Architecture for Seamless IP Mobility using Scalable Anycast Proxies. In *IEEE Wireless Communications and Networking Conference*, Hong Kong, March 2007.

C.0.3   Anirudh Ramachandran and Nick Feamster. Understanding the Network-Level Behavior of Spammers. In *Proc. ACM SIGCOMM*, Pisa, Italy, August 2006. An earlier version appeared as Georgia Tech TR GT-CSS-2006-001.
Best student paper award.

C.0.4   Andy Bavier, Nick Feamster, Mark Huang, Larry Peterson, and Jennifer Rexford. In VINI Veritas: Realistic and controlled network experimentation. In *Proc. ACM SIGCOMM*, Pisa, Italy, August 2006.

C.0.5   Nick Feamster and Hari Balakrishnan. Correctness Properties for Internet Routing. In *Forty-third Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, September 2005.

C.0.6   Nick Feamster, Ramesh Johari, and Hari Balakrishnan. The Implications of Autonomy for Stable Policy Routing. In *Proc. ACM SIGCOMM*, pages 25–36, Philadelphia, PA, August 2005.

C.0.7   Michael Freedman, Mythili Vutukuru, Nick Feamster, and Hari Balakrishnan. Geographic Locality of IP Prefixes. In *Proc. ACM SIGCOMM Internet Measurement Conference*, New Orleans, LA, October 2005.

C.0.8   Nick Feamster and Hari Balakrishnan. Detecting BGP Configuration Faults with Static Analysis. In *Proc. 2nd Symposium on Networked Systems Design and Implementation (NSDI)*, pages 43–56, Boston, MA, May 2005.
Best paper award.

C.0.9   Matthew Caesar, Don Caldwell, Nick Feamster, Jennifer Rexford, Aman Shaikh, and Kobus van der Merwe. Design and Implementation of a Routing Control Platform. In *Proc. 2nd Symposium on Networked Systems Design and Implementation (NSDI)*, pages 15–28, Boston, MA, May 2005.

C.0.10   Nick Feamster, Zhuoqing Morley Mao, and Jennifer Rexford. BorderGuard: Detecting Cold Potatoes from Peers. In *Proc. ACM SIGCOMM Internet Measurement Conference*, pages 213–218, Taormina, Sicily, Italy, October 2004.

C.0.11   Nick Feamster, Jared Winick, and Jennifer Rexford. A Model of BGP Routing for Network Engineering. In *Proc. ACM SIGMETRICS*, pages 331–342, New York, NY, June 2004.

C.0.12   Nick Feamster, David Andersen, Hari Balakrishnan, and M. Frans Kaashoek. Measuring the Effects of Internet Path Faults on Reactive Routing. In *Proc. ACM SIGMETRICS*, pages 126–137, San Diego, CA, June 2003.

C.0.13   Nick Feamster, Magdalena Balazinska, Greg Harfst, Hari Balakrishnan, and David Karger. Infranet: Circumventing Web censorship and surveillance. In *Proc. 11th USENIX Security Symposium*, San Francisco, CA, August 2002.
Best student paper award.

C.0.14   Kevin Fu, Emil Sit, Kendra Smith, and Nick Feamster. Dos and don'ts of client authentication on the Web. In *Proc. 10th USENIX Security Symposium*, Washington, DC, August 2001.
Best student paper award.

C.0.15   Susie Wee, John Apostolopoulos, and Nick Feamster. Field-to-frame transcoding with temporal and spatial downsampling. In *IEEE International Conference on Image Processing*, October 1999.

C.0.16   Nick Feamster and Susie Wee. An MPEG-2 to H.263 transcoder. In *SPIE Voice, Video, and Data Communications Conference*, Boston, MA, September 1999.

D.   Workshop Publications

D.0.1   Anirudh Ramachandran, Nick Feamster, and David Dagon. Revealing Botnet Membership with DNSBL Counter-Intelligence. In *2nd USENIX Workshop on Steps to Reducing Unwanted Traffic on the Internet (SRUTI)*, San Jose, CA, July 2006.

D.0.2   Anirudh Ramachandran, David Dagon, and Nick Feamster. Can DNSBLs Keep Up with Bots? In *3rd Conference on Email and Anti-Spam (CEAS)*, Mountain View, CA, July 2006.

D.0.3   Nick Feamster, Hari Balakrishnan, and Jennifer Rexford. Some foundational problems in interdomain routing. In *Proc. 3nd ACM Workshop on Hot Topics in Networks (Hotnets-III)*, San Diego, CA, November 2004.

D.0.4   Nick Feamster, Hari Balakrishnan, Jennifer Rexford, Aman Shaikh, and Kobus van der Merwe. The Case for Separating Routing from Routers. In *ACM SIGCOMM Workshop on Future Directions in Network Architecture*, pages 5–12, Portland, OR, September 2004.

D.0.5   Nick Feamster and Roger Dingledine. Location diversity in anonymity networks. In *ACM Workshop on Privacy in the Electronic Society*, Washington, DC, October 2004.

D.0.6   Nick Feamster, Magdalena Balazinska, Winston Wang, Hari Balakrishnan, and David Karger. Thwarting Web censorship with untrusted messenger discovery. In *3rd Workshop on Privacy Enhancing Technologies*, Dresden, Germany, March 2003.

D.0.7   Nick Feamster. Practical Verification Techniques for Wide-Area Routing. In *Proc. 2nd ACM Workshop on Hot Topics in Networks (Hotnets-II)*, pages 87–92, Cambridge, MA, November 2003.

D.0.8   Nick Feamster and Hari Balakrishnan. Towards a Logic for Wide-Area Internet Routing. In *ACM SIGCOMM Workshop on Future Directions in Network Architecture*, pages 289–300, Karlsruhe, Germany, August 2003.

D.0.9   David G. Andersen, Nick Feamster, Steve Bauer, and Hari Balakrishnan. Topology inference from BGP routing dynamics. In *Proc. ACM SIGCOMM Internet Measurement Workshop*, Marseille, France, November 2002.

D.0.10   Nick Feamster and Hari Balakrishnan. Packet loss recovery for streaming video. In *Proc. 12th International Packet Video Workshop (PV 2002)*, Pittsburgh, PA, April 2002.

D.0.11   Nick Feamster, Deepak Bansal, and Hari Balakrishnan. On the interactions between congestion control and layered quality adaptation for streaming video. In *11th International Packet Video Workshop*, Kyongju, Korea, May 2001.

E. Other

E.1. Submitted Journal Papers

Removed for external version.

E.2. Submitted Conference and Workshop Papers

Removed for external version.

E.3. Other Technical Reports and Unrefereed Papers

E.3.1   Nick Feamster, Lixin Gao, and Jennifer Rexford. How to Lease the Internet in Your Spare Time. *ACM Computer Communications Review*, 37(1), January 2007. Editorial section.

E.3.2   Nick Feamster. Can Information from End Systems Improve Routing? In *Workshop on Internet Routing Evolution and Design (WIRED)*, Atlanta, GA, October 2006.

E.3.3   Murtaza Motiwala and Nick Feamster. Network Troubleshooting on Data Plane Coattails. In *Workshop on Internet Routing Evolution and Design (WIRED)*, Atlanta, GA, October 2006.

E.3.4   David G. Andersen and Nick Feamster. Challenges and opportunities in Internet data mining. Technical Report CMU-PDL-06-102, Carnegie Mellon University, January 2006.

E.3.5   Nick Feamster and Hari Balakrishnan. Verifying the correctness of wide-area Internet routing. Technical Report MIT-LCS-TR-948, Massachusetts Institute of Technology, May 2004.

E.3.6   Nick Feamster. Rethinking routing configuration: Beyond stimulus-response reasoning. In *Workshop on Internet Routing Evolution and Design (WIRED)*, Mt. Hood, OR, October 2003.

E.3.7   Nick Feamster and Jennifer Rexford. Network-Wide BGP Route Prediction for Traffic Engineering. In *Proc. SPIE ITCom*, volume 4868, pages 55–68, Boston, MA, August 2002.

E.3.8   Nick Feamster, Jennifer Rexford, and Jay Borkenhagen. Controlling the impact of BGP policy changes on IP traffic. Technical Report 011106-02, AT&T Labs–Research, Florham Park, NJ, November 2001.

E.3.9   Russ White, B. Akyol, and Nick Feamster. *Considerations in Validating the Path in Routing Protocols*. IETF, June 2005.

E.4. Software

E.4.1   *Virtual Network Infrastructure*. In progress project to build a large distributed testbed for specifying virtual network topologies and experimenting with routing protocols and architectures in a controlled, realistic emulation environment. Current prototype implementation is on PlanetLab.

E.4.2   *The Datapository*. Originally the "MIT BGP Monitor", the Datapository is growing to support multiple data feeds (*e.g.,* spam, end-to-end measurement probes, traceroutes, Abilene data, etc.). Currently used by researchers at Georgia Tech, Carnegie Mellon, University of Michigan, Princeton, MIT.

E.4.3   *Secure BGP Implementation*. Implementation of S-BGP in the Quagga software router. Our implementation may be used by Randy Bush and Geoff Huston in their project to develop a certificate infrastructure for secure routing protocols.

E.4.4   *rcc: router configuration checker*. Static configuration analysis tool for Border Gateway Protocol (BGP) routing configuraions. Downloaded by over 100 network operators and many large, nationwide backbone ISPs around the world.

E.4.5   *Infranet*. System for circumventing Web censorship firewalls (*e.g.,* those in China, Saudia Arabia, etc.). Available on Sourceforge. Featured in articles in *Technology Review*, *New Scientist*, and *Slashdot*.

E.4.6   *SR-RTP*. Transport protocol for selective retransmission of packets in an MPEG video stream. Incorporated into "Oxygen TV" for MIT Project Oxygen. Some ideas incorporated into the OpenDivX video transport protocol.

E.5. Conference Posters

E.5.1   Anirudh Ramachandran and Nick Feamster. Understanding the Network-Level Behavior of Spammers. In *Proc. Third Symposium on Networked Systems Design and Implementation (NSDI)*, San Jose, CA, May 2006.

E.5.2   Nick Feamster and Hari Balakrishnan. Detecting BGP Configuration Faults with Static Analysis. In *Proc. First Symposium on Networked Systems Design and Implementation (NSDI)*, San Francisco, CA, March 2004.

F.   Research Proposals and Grants (Principal Investigator)

1. Approved and Funded

F.1.1   **Verification and Modeling of Wide-Area Internet Routing**
       Sponsor: Cisco Systems University Research Program
       Investigator(s): N. Feamster and H. Balakrishnan
       Amount: *$ 95,500 for 1 year.*
       Awarded: June 2004

F.1.2 **CABO: Concurrent Architectures are Better than One**
Sponsor: National Science Foundation NeTS-FIND Program
Investigator(s): N. Feamster, L. Gao, J. Rexford
Amount: *$ 300,000 for 4 years*
Awarded: June 2006

F.1.3 **Equipment Donation for Network Operations Research**
Sponsor: Intel Corporation
Investigator(s): N. Feamster
Amount: *$30,000*
Awarded: October 2006

F.1.4 **Improving Network Operations with a View from the Edge.**
Sponsor: National Science Foundation CAREER Program
Investigator(s): N. Feamster
Amount: *$400,000 for 5 years.*
Awarded: January 2007

F.1.5 **Fish4Phish: Fishing for Phishing in a Large Pond**
Sponsor: AT&T Labs—Research
Investigator(s): N. Feamster, O. Spatscheck, K. van der Merwe
Amount: *Funding for summer intern.*
Awarded: February 2007

2. Pending

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G.   Research Proposals and Grants (Contributor)

1. Approved and Funded

Removed for external version.

2. Pending

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H.   Research Honors and Awards

2007	NSF CAREER Award
2006	George M. Sprowls honorable mention for best Ph.D. thesis in computer science, MIT
2006	Best Student Paper, *ACM SIGCOMM* (Premier Networking Conference)
2005	Best Paper, *2nd USENIX Symposium on Networked Systems Design and Implementation*
2002	Best Student Paper, *11th Usenix Security Symposium*
2001	Best Student Paper, *10th Usenix Security Symposium*
2002–2005	NSF Graduate Research Fellow
2001	MIT William A. Martin Memorial Thesis Award for Best EECS Master's Thesis

III. SERVICE

A. Professional Activities

A.1. Memberships and Activities in Professional Societies

Member, ACM Special Interest Group on Data Communications (SIGCOMM)

Member, USENIX Technical Association

A.2. Conference Committee Activities

2007	Co-Organizer, DIMACS Workshop Series on Internet Security
2007	Program Committee, *4th Conference on Email and Anti-Spam (CEAS)*
2007	Program Committee, *3rd USENIX Workshop on Steps to Reduce Unwanted Traffic on the Internet (SRUTI)*
2007	Program Committee, *USENIX Technical Conference*
2007	Program Committee, *CoNext*
2007	Program Committee, *16th International World Wide Web Conference* (Security/Privacy Track)
2007	Program Committee Co-Chair, *ACM/USENIX Workshop on Networks meet Databases (NetDB)*
2006–	Program Committee, *North American Network Operators Group (NANOG)*
2006	Organizer, *Workshop on Internet Routing Evolution and Design*
2006	Program Committee, *ACM SIGCOMM Internet Measurement Conference*
2006	Program Committee Co-Chair, *Workshop on the Economics of Networked Systems (NetEcon)*
2006	Program Committee Co-Chair, *CoNEXT Student Workshop*
2006	Program Committee, *CoNEXT*
2006	Program Committee, *ACM SIGCOMM Workshop on Internet Network Management*
2006	Program Committee, *IEEE Symposium on Security and Privacy*
2006	Program Committee, *IEEE Infocom Student Poster Session*
2006	Program Committee, *IEEE International Conference on Internet Surveillance and Protection*

External reviewer for *IEEE/ACM Transactions on Networking*, *SIGCOMM* (2002, 2003, 2004, 2006), *SOSP* (2001, 2003), *Infocom* (2004, 2006), *HotNets* (2003), *HotOS* (2001), *USENIX Security Symposium* (2002), *ACM Computer Communication Review, IEEE Network Magazine, IEEE Journal on Selected Areas in Communications, Image Communication* (EURASIP), *ASPLOS* (2004), *MobiSys* (2004), *USENIX* (2005, 2006), *NSDI* (2005, 2006), *IPTPS* (2005), *Workshop on Privacy Enhancing Technologies* (2006).

A.3. Workshops and External Courses

Unless otherwise noted, all listed activities are invited speaking invitations for workshops and symposia.

February 2007	GIG Routing and Addressing Workshop, Washington, DC
February 2007	DARPA Workshop on Assurable Global Networking, Washington, DC

December 2006	Next-Generation Internet Workshop, Lisbon, Portugal
September 2006	Clean Slate Network Research Symposium, Cambridge, UK
October 2006	**Co-organizer**, Workshop on Internet Routing Evolution and Design (WIRED), Atlanta, GA
August 2006	Cisco Routing Research Symposium, San Jose, CA
June 2006	ARO-DARPA-DHS Special Workshop on Botnets, Arlington, VA
June 2006	Microsoft Research EdgeNet Workshop, Snoqualmie, WA
June 2006	Microsoft Research "Networking on the Edge" Workshop on Network Management, Seattle, WA
February 2006	NSF Workshop on Theory of Networked Computation, Princeton, NJ
January 2006	Cisco Network Management Summit, San Jose, CA

B. On-Campus Georgia Tech Committees

Spring 2006	Ph.D. Recruiting Weekend Organizing Committee, CSS Division Leader
Spring 2006 –	College of Computing Strategic Planning Committee
Fall 2006 –	Area Coordinator, Networking and Telecommunications Group
Fall 2006	Co-Organizer, Networking and Telecommunications Group Open House

C. Member of Ph.D. Examining Committees

Ph.D. Thesis Committee – Georgia Tech

1. Ruomei Gao, College of Computing, Georgia Tech., Fall 2005.
   Principal Advisor: Professors Ellen Zegura and Constantine Dovrolis.

2. Sridhar Srinivasan, College of Computing, Georgia Tech., Spring 2006.
   Principal Advisor: Professor Ellen Zegura.

3. Xenofontas Dimitropoulos, Electrical and Computer Engineering, Georgia Tech., Spring 2006.
   Principal Advisor: Professor George Riley.

4. Qi Zhao, College of Computing, Georgia Tech., Spring 2006.
   Principal Advisor: Professor Jim Xu.

5. Prahlad Fogla, College of Computing, Georgia Tech., Spring 2007.
   Principal Advisor: Professor Wenke Lee.

6. Srinivasan Seetharaman, College of Computing, Georgia Tech., Spring 2007.
   Principal Advisor: Professor Mostafa Ammar.

Other — Question writer for Ph.D. Qualifying Exam

1. Yang Chen, College of Computing, Georgia Tech., Spring 2006.
   Principal Advisor: Professor Jim Xu.

D. Consulting, Advisory, and Other External Appointments

1. Technical Advisory Board, Guavus, Inc. `http://www.guavus.com/`

2. Technical Advisory Board, Fraudwall, Inc. `http://www.fraudwall.net/`

3. Consultant, Damballa, Inc. `http://www.damballa.com/`

IV. NATIONAL AND INTERNATIONAL RECOGNITION

A. Editorial and Reviewer Work for Technical Journals and Publishers

External reviewer for *IEEE/ACM Transactions on Networking*

External reviewer for *IEEE Journal on Selected Areas in Communications*

External reviewer for *IEEE Computer Networks*

External reviewer for *ACM Transactions on Information and Systems Security*

V. OTHER CONTRIBUTIONS

A. Seminar Presentations

A.0.1   Towards an Accountable Internet Architecture. In *DARPA GIG Routing and Addressing Workshop*, Arlington, VA, February 2007.

A.0.2   Towards an Accountable Internet Architecture. In *DARPA STO Assurable Global Networking Workshop*, Arlington, VA, February 2007.

A.0.3   Improving Network Operations with a View from the Edge. In *National Science Foundation CyberTrust PI Meeting*, Atlanta, GA, January 2007.

A.0.4   Network Virtualization for Experimentation and Profit. In *University of Michigan Networking Seminar*, Ann Arbor, MI, December 2006.

A.0.5   Network Virtualization for Experimentation and Profit. In *Stanford Networking Seminar*, Stanford, CA, November 2006.

A.0.6   Network Architecture Research. In *National Science Foundation NeTS-FIND Informational Meeting*, Reston, VA, November 2006.

A.0.7   Network Virtualization. In *National Science Foundation NeTS-FIND PI Meeting*, Reston, VA, November 2006.

A.0.8   Understanding the Network-Level Behavior of Spammers. In *Johns Hopkins Security and Applied Research Lab Seminar*, Baltimore, MD, October 2006.

A.0.9   Revealing Botnet Membership with DNSBL Counter-Intelligence. In *NANOG 38*, St. Louis, MO, October 2006.

A.0.10   VINI: A Virtual Network Infrastructure. In *Centre national de la recherche scientifique (CNRS)*, Paris, France, September 2006.

A.0.11   Botnets and Spam. In *Seminar: Laboratoire d'informatique de Paris 6*, Paris, France, September 2006.

A.0.12   Network Virtualization and Graph Embedding. In *Georgia Tech Algorithms and Randomness Center Seminar*, Atlanta, GA, September 2006.

A.0.13   Cabo: Concurrent Architectures are Better than One. In *Cisco Internet Routing Research Symposium*, San Jose, CA, August 2006.

A.0.14   Botnets and Spam. In *ARO-DARPA-DHS Special Workshop on Botnets*, Arlington, VA, June 2006.

A.0.15	Understanding the Network-Level Behavior of Spammers. In *CS 548: Internet and Distributed Systems Seminar*, Stanford, CA, June 2006.
A.0.16	Understanding the Network-Level Behavior of Spammers. In *NANOG 37*, San Jose, CA, June 2006.
A.0.17	Campus and Personal Network Troubleshooting. In *Microsoft Research EdgeNet 2006*, Snoqualmie, WA, June 2006.
A.0.18	Infranet: Circumventing Web censorship and surveillance. In *Georgia Tech NTG Seminar*, Atlanta, GA, April 2006.
A.0.19	Filtering: Sharpening Two Sides of a Double-Edged Sword. In *Interz0ne 5*, Tucker, GA, March 2006.
A.0.20	Theory of Measurement and Monitoring. In *Workshop on the Theory of Networked Computation*, Princeton, NJ, February 2006.
A.0.21	Challenges and Opportunities in Internet Data Mining. In *Cisco Network Management Summit*, San Jose, CA, February 2006.
A.0.22	BGP Spamming Agility. In *NANOG 36*, Dallas, TX, February 2006.
A.0.23	Spam Forensics. In *IEEE Security and Privacy Crystal Ball Workshop*, Berkeley, CA, February 2006.
A.0.24	Network Security. In *Georgia Tech Information Security Center Lunch*, Atlanta, GA, January 2006.
A.0.25	Geographic Locality of IP Prefixes. In *NANOG 35*, Los Angeles, CA, October 2005.
A.0.26	rcc demonstration. In *NANOG 35*, Los Angeles, CA, October 2005.
A.0.27	Detecting BGP Configuration Faults with Static Analysis. In *Princeton University Systems Reading Group*, Princeton, NJ, October 2005.
A.0.28	Proactive Techniques for Correct and Predictable Internet Routing. In *University of Cambridge Symposium*, England, United Kingdom, June 2005.
A.0.29	Proactive Techniques for Correct and Predictable Internet Routing. In *Hewlett-Packard Laboratories*, Palo Alto, CA, October 2005.
A.0.30	Open problems in BGP anomaly detection. In *CAIDA Workshop on Internet Signal Processing*, San Diego, CA, November 2004.
A.0.31	On end-to-end path failures and routing instability. In *CAIDA Workshop on Internet Signal Processing*, San Diego, CA, November 2004.
A.0.32	Wide-area network data and analysis at MIT. In *CAIDA Internet Measurement Data Catalog Workshop*, San Diego, CA, June 2004.
A.0.33	Verifying wide-area routing configuration. In *NANOG 31*, San Francisco, CA, May 2004.
A.0.34	Verifying wide-area routing configuration with **rcc**. AT&T Labs; Florham Park, NJ, February 2004.
A.0.35	Verifying wide-area routing configuration with **rcc**. In *NYU Systems Reading Group*, New York, NY, February 2004.

A.0.36   A systematic approach to BGP configuration checking. In *NANOG 29*, Chicago, IL, October 2003.

A.0.37   Characterizing path failures: Location, characterization, correlation. In *CAIDA Internet Statistics, Metrics, and Analysis Workshop*, Leiden, The Netherlands, October 2002.

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