

Aditya Akella

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Employment

Associate Professor <i>University of Wisconsin-Madison</i>	Jul 2012-Present
Assistant Professor <i>University of Wisconsin-Madison</i>	August 2006-Jul 2012
Post-doctoral Associate <i>Stanford University</i>	September 2005-August 2006

Education

PhD in Computer Science <i>Carnegie Mellon University</i>	September 2005
Dissertation title: "End Point-based Routing Strategies for Improving Internet Performance and Resilience" Advisor: Srinivasan Seshan	
B. Tech. in Computer Science and Engineering <i>Indian Institute of Technology, Madras</i>	May 2000

Honors and Awards

Sigcomm Outstanding Reviewer Award, 2012
IMC Best Paper Award, 2010
NetApp Faculty Fellowship, 2010
IEEE COMSNETS Best Paper Award, 2010
Top ranked paper at ACM Sigcomm WREN Workshop, 2009
IEEE COMSNETS Best Paper Award, 2009
NSF CAREER Award, 2008
Fast Track Paper at MobiCom, 2005
IBM PhD Fellowship, 2003-05

Research Interests

Computer Networking, spanning the areas of Network Architecture, Internet Routing, Network Management, Measurement, Network Security and Wireless Networking.

Journal Articles

1. Theophilus Benson, Ashok Anand, Aditya Akella and Ming Zhang, "Understanding Data Center Traffic Characteristics", *ACM Sigcomm Computer Communications Review*, February 2010.

2. Gireesh Shrimali, Aditya Akella and Almir Mutapcic. "Cooperative Inter-Domain Traffic Engineering Using Nash Bargaining and Decomposition", *IEEE/ACM Transactions on Networking*, April 2010.
3. Aditya Akella, Bruce Maggs, Srinivasan Seshan and Anees Shaikh. "On the Performance Benefits of Multihoming Route Control", *IEEE/ACM Transactions on Networking*, Vol. 16, Issue 1, pp 91–104, February 2008.
4. Aditya Akella, Glenn Judd, Srinivasan Seshan and Peter Steenkiste. "Self-Management in Chaotic Wireless Deployments", *Springer Verlag Wireless Networks (WINET)*, Vol. 13, No. 6, pp 737–755, October 2006.
5. Aditya Akella, Shuchi Chawla, Arvind Kannan and Srinivasan Seshan, "On the Scaling of Congestion in the Internet Graph", *ACM SIGCOMM Computer Communication Review*, Vol. 34, No.3, Special Issue on Science of Network Design, pp 43–55, July 2004.

Conference Papers (work done at UW-Madison)

(My students are highlighted)

1. Aaron Gember, Aditya Akella, Jeffrey Pang, Alexander Varshavsky and Ramon Caceres, "Obtaining Representative Measurements of Cellular Network Performance", IMC, Boston, MA, October 2012. Conference acceptance rate: 24% (45/183)
2. Shan Hsiang-Shen and Aditya Akella, "DECOR: a Distributed Coordinated Resource Monitoring System", IWQoS, Coimbra, Portugal, June 2012. Conference acceptance rate: 22% (24/110)
3. Dongsu Han, Ashok Anand, Aditya Akella and Srinivasan Seshan, "RPT: Re-architecting Loss Protection for Content-Aware Networks", *USENIX NSDI*, San Jose, CA, April 2012. Conference acceptance rate: 18% (30/169).
4. Dongsu Han, Ashok Anand, Fahad Dogar, Boyan Li, Hyeontaek Lim, Michel Machado, Arvind Mukundan, Wenfei Wu, Aditya Akella, David Andersen, John Byers, Srinivasan Seshan and Peter Steenkiste, "XIA: Efficient Support for Evolvable Internetworking", *USENIX NSDI*, San Jose, CA, April 2012. Conference acceptance rate: 18% (30/169).
5. Holly Esquivel, Chitra Muthukrishnan, Aditya Akella and Shuchi Chawla, "Better Internet Routing Through Intrinsic Support for Selfishness", *IEEE COMSNETS*, Bangalore, India, January 2012. Conference acceptance rate: 26% (45/170).
6. Theophilus Benson, Ashok Anand, Aditya Akella and Ming Zhang, "MicroTE: Fine Grained Traffic Engineering for Data Centers", *ACM CoNEXT*, Tokyo, Japan, December 2011. Conference acceptance rate: 19% (30/159).
7. Ashok Anand, Fahad Dogar, Dongsu Han, Boyan Li, Hyeontaek Lim, Michel Machado, Wenfei Wu, Aditya Akella, David Andersen, John Byers, Srinivasan Seshan and Peter Steenkiste, "XIA: An Architecture for an Evolvable and Trustworthy Internet", *HotNets*, Cambridge, MA, November 2011. Conference acceptance rate: 20% (24/119).
8. Hyojoon Kim, Theophilus Benson, Aditya Akella and Nick Feamster, "Understanding the Evolution of Network Configuration: A Tale of Two Campuses", *IMC*, Berlin, Germany, November 2011. Conference acceptance rate: 19% (42/220).
9. Theophilus Benson, Aditya Akella, Anees Shaikh and Sambit Sahu, "CloudNaaS: A Cloud Networking Platform for Enterprise Applications", *ACM SOCC*, Cascais, Portugal, October 2011. Conference acceptance rate: 17% (30/178).
10. Shan-Hsiang Shen, Aaron Gember, Ashok Anand and Aditya Akella, "Refactoring Content Overhearing to Improve Wireless Performance", *ACM MobiCom*, Las Vegas, NV, September 2011. Conference acceptance rate: 14% (29/214).
11. Theophilus Benson, Aditya Akella and Aman Shaikh, "Demystifying Configuration Challenges and Trade-offs in Network-Based ISP Services", *ACM SIGCOMM*, Toronto, Canada, August 2011. Conference acceptance rate: 14% (32/223).

12. Aditya Akella, Shuchi Chawla, Holly Esquivel and Chitra Muthukrishnan, “De-Ossifying Internet Routing Through Intrinsic Support for ISP and End-Network Selfishness”, *ACM SIGMETRICS (Extended abstract)*, San Jose, CA, June 2011.
13. Aaron Gember, Ashok Anand, and Aditya Akella, “A Comparative Study of Handheld and Non-Handheld Traffic in Campus WiFi Networks”, *PAM*, Atlanta, GA, March 2011. Conference acceptance rate: 43% (24/56).
14. Theophilus Benson, Aditya Akella and David Maltz, “Network Traffic Characteristics of Data Centers in the Wild”, *IMC*, Melbourne, Australia, November 2010. *Best paper award*. Conference acceptance rate: 22% (47/211).
15. Ashok Anand, Aditya Akella, Vyas Sekar and Srinivasan Seshan, “A Case for Information-Bound Referencing”, *HotNets*, Irvine, CA, October 2010. Conference acceptance rate: 21% (22/104).
16. Chitra Muthukrishnan, Vern Paxson, Mark Allman and Aditya Akella, “Using Strongly Typed Networking to Architect for Tussle”, *HotNets*, Irvine, CA, October 2010. Conference acceptance rate: 21% (22/104).
17. Theophilus Benson, Sambit Sahu, Aditya Akella and Anees Shaikh, “A First Look at Problems in the Cloud”. *USENIX HotCloud*, Boston, MA, June 2010. Conference acceptance rate: 24% (18/74).
18. Holly Esquivel, Tatsuya Mori and Aditya Akella, “Understanding Large-Scale Spamming Botnets From Internet Edge Sites”, Conference on E-Mail and Anti-Spam, Seattle, WA, June 2010.
19. Ashok Anand, Chitra Muthukrishnan, Steven Kappes, Aditya Akella and Suman Nath, “Cheap and Large CAMs for High-performance Data-intensive Networked Systems”, *USENIX NSDI*, San Jose, CA, April 2010. Conference acceptance rate: 15% (29/180).
20. Bhavish Aggarwal, Aditya Akella, Ashok Anand, Pushkar Chitnis, Chitra Muthukrishnan, Athula Nair, Ram Ramjee and George Varghese, “EndRE: An End-System Redundancy Elimination Service for Enterprises”, *USENIX NSDI*, San Jose, CA, April 2010. Conference acceptance rate: 15% (29/180).
21. Holly Esquivel, Tatsuya Mori and Aditya Akella, “On the Effectiveness of IP reputation for Spam Filtering”, *IEEE COMSNETS*, Bangalore, India, January 2010. *Best paper award*. Conference acceptance rate: 20% (31/153).
22. Pratap Ramamurthy, Aditya Akella and Almir Mutapcic, “NashWiFi: Coordinated Management of Heterogenous Home 802.11 Networks Using Bargaining”, *IEEE COMSNETS*, Bangalore, India, January 2010. Conference acceptance rate: 20% (31/153).
23. Theophilus Benson, Aditya Akella and David Maltz, “Mining Policies from Enterprise Network Configurations”, *IMC*, Chicago, IL, October 2009. Conference acceptance rate: 22% (40/185).
24. Ashok Anand, Vyas Sekar and Aditya Akella, “SmartRE: An Architecture for Coordinated Network-wide Redundancy Elimination”, *ACM SIGCOMM*, Barcelona, Spain, August 2009. Conference acceptance rate: 10% (27/270).
25. Holly Esquivel, Tatsuya Mori and Aditya Akella, “Router-Level Spam Filtering Using TCP Fingerprints: Architecture and Measurement-Based Evaluation”, *Conference on E-Mail and Anti-Spam (CEAS)*, Mountain View, CA, July 2009. Conference acceptance rate: N/A.
26. Ashok Anand, Chitra Muthukrishnan, Aditya Akella and Ram Ramjee. “Redundancy in Network Traffic: Findings and Implications”, *ACM SIGMETRICS*, Seattle, WA, June 2009. Conference acceptance rate: 15% (27/180).
27. Venugopalan Ramasubramanian, Fabian Kuhn, Dahlia Malkhi, Mahesh Balakrishnan, Archit Gupta and Aditya Akella. “On the Treeness of Internet Latency and Bandwidth”, *ACM SIGMETRICS*, Seattle, WA, June 2009. Conference acceptance rate: 15% (27/180).

28. Theophilus Benson, Aditya Akella and David Maltz. “Unraveling the Complexity of Network Management”, *USENIX NSDI*, Boston, MA, April 2009. Conference acceptance rate: 20% (32/162).
29. Archit Gupta, Pavan Kuppili, Aditya Akella and Paul Barford. “An Empirical Study of Malware Evolution”, *IEEE COMSNETS*, Bangalore, India, January 2009. *Best paper award*. Conference acceptance rate: 20% (46/230).
30. 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”, *USENIX OSDI*, San Diego, CA, December 2008. Conference acceptance rate: 12% (26/193).
31. Ashok Anand, Archit Gupta, Aditya Akella, Srinivasan Seshan and Scott Shenker. “Packet Caches on Routers: The Implications of Universal Redundant Traffic Elimination”, *ACM SIGCOMM*, Seattle, WA, August 2008. Conference acceptance rate: 12% (36/288).
32. Pratap Ramamurthy, Vyas Sekar, Aditya Akella, Balachander Krishnamurthy and Anees Shaikh. “Remote Profiling of Resource Constraints in Web Servers Using Mini-Flash Crowds”, *USENIX Annual Technical Conference*, Boston, MA, June 2008. Conference acceptance rate: 20% (34/176).
33. Eric Rozner, Yogita Mehta, Aditya Akella and Lili Qiu. “Traffic Aware Channel Assignment in Wireless LANs”, *IEEE ICNP*, Beijing, China, November 2007. Conference acceptance rate: 14% (32/220).
34. Gireesh Shrimali, Aditya Akella and Almir Mutapcic. “Cooperative Inter-Domain Traffic Engineering Using Nash Bargaining and Decomposition”, *IEEE Infocom*, Anchorage, AK, May 2007. Conference acceptance rate: 18% (252/1400).
35. Cristian Estan, Aditya Akella and Suman Banerjee. “Achieving Good End-to-End Service Using Bill-Pay”, *Hotnets-V*, Irvine, CA, November 2006. Conference acceptance rate: 20% (23/114).

Workshop Papers (work done at UW-Madison)

1. Aaron Gember, Theophilus Benson, and Aditya Akella, “Challenges in Unifying Control of Middlebox Traversals and Functionality”, *LADIS*, Madeira, Portugal, July 2-12.
2. Aaron Gember and Aditya Akella, “ECOS: Practical Mobile Application Offloading for Enterprises”, *Hot-ICE*, San Jose, CA, April 2012.
3. Ashok Anand, Aaron Gember, Vyas Sekar and Aditya Akella, “Tracking Semantic Relationships for Effective Data Management in Home Networks”, *ACM SIGCOMM HomeNets Workshop*, New Delhi, India, August 2010.
4. Theophilus Benson, Ashok Anand, Aditya Akella and Ming Zhang, “The Case for Fine-grained Traffic Engineering in Data-centers”, *USENIX INM/WREN*, San Jose, CA, April 2010.
5. Jeffrey Ballard, Ian Rae and Aditya Akella, “Extensible and Scalable Network Monitoring Using OpenSAFE”, *USENIX INM/WREN*, San Jose, CA, April 2010.
6. Theophilus Benson, Ashok Anand, Aditya Akella and Ming Zhang, “Understanding Data Center Traffic Characteristics”, *ACM SIGCOMM Workshop: Research on Enterprise Networks*, Barcelona, Spain, August 2009. *Top ranked paper*. Conference acceptance rate: N/A.
7. Ashok Anand and Aditya Akella, “Net-Replay: A New Network Primitive”, *Workshop on Hot Topics in Measurement and Modeling of Computer Systems (HotMetrics)*, Seattle, WA, June 2009. Conference acceptance rate: N/A.
8. Pratap Ramamurthy, Vyas Sekar, Aditya Akella, Balachander Krishnamurthy and Anees Shaikh. “Using Mini-Flash Crowds to Infer Resource Constraints in Remote Web Servers”, *ACM SIGCOMM Workshop on Internet Network Management (INM)*, Kyoto, Japan, August 2007. Conference acceptance rate: N/A.

Prior Work (Conference and Workshop Papers)

1. Martin Casado, Tal Garfinkel, Aditya Akella, Michael Freedman, Dan Boneh, Nick McKeown and Scott Shenker. "SANE: A Protection Architecture for Enterprise Networks", *USENIX Security*, Vancouver, BC, August 2006. Conference acceptance rate: 12% (22/179).
2. Martin Casado, Aditya Akella, Pei Cao, Neils Provos and Scott Shenker. "Cookies Along Trust Boundaries (CAT): Accurate and Deployable Flood Protection", *USENIX Workshop on Steps to Reducing Unwanted Traffic on the Internet (SRUTI)*, San Jose, CA, July 2006. Conference acceptance rate: N/A.
3. Martin Casado, Pei Cao, Aditya Akella and Neils Provos. "Flow Cookies: Using Bandwidth Amplification to Defend Against DDoS Flooding Attacks", *International Workshop on Quality-of-Service (IWQoS)*, New Haven, CT, June 2006. Conference acceptance rate: 25% (40/157).
4. Aditya Akella, Glenn Judd, Srinivasan Seshan and Peter Steenkiste. "Self-Management in Chaotic Wireless Deployments", *ACM MobiCom*, Cologne, Germany, August 2005. Conference acceptance rate: 10% (23/224).
5. Jeffrey Pang, James Hendricks, Aditya Akella, Bruce Maggs, Roberto De Prisco and Srinivasan Seshan. "Availability, Usage, and Deployment Characteristics of the Domain Name System", *Internet Measurement Conference (IMC)*, Taormina, Italy, October 2004. Conference acceptance rate: 25% (39/157).
6. Jeffrey Pang, Aditya Akella, Anees Shaikh, Balachander Krishnamurthy and Srinivasan Seshan. "On the Responsiveness of DNS-based Network Control", *Internet Measurement Conference (IMC)*, Taormina, Italy, October 2004. Conference acceptance rate: 25% (39/157).
7. Aditya Akella, Jeffrey Pang, Anees Shaikh, Bruce Maggs and Srinivasan Seshan. "A Comparison of Overlay Routing and Multihoming Route Control", *ACM SIGCOMM*, Portland, OR, August 2004. Conference acceptance rate: 9% (31/340).
8. Aditya Akella, Anees Shaikh and Srinivasan Seshan. "Multihoming Performance Benefits: An Experimental Evaluation of Practical Enterprise Strategies", *USENIX Annual Technical Conference*, Boston, MA, June 2004. Conference acceptance rate: 13% (21/164).
9. Aditya Akella, Hari Balakrishnan and Srinivasan Seshan. "The Impact of False Sharing on Shared Congestion Management", *IEEE International Conference on Network Protocols (ICNP)*, Atlanta, GA, November 2003. Conference acceptance rate: N/A.
10. Aditya Akella, Srinivasan Seshan and Anees Shaikh. "An Empirical Evaluation of Wide-Area Internet Bottlenecks", *Internet Measurement Conference (IMC)*, Miami, FL, October 2003. Conference acceptance rate: 29% (32/109).
11. Aditya Akella. "Understanding the Impact of Route Control Product Deployment", Invited paper, *Workshop on Internet Routing Evolution and Design*, Mount Hood, OR, October 2003.
12. Aditya Akella, Srinivasan Seshan and Anees Shaikh. "Toward Representative Internet Measurements", *3rd New York Metro Area Networking Workshop*, New York, NY, September 2003. Conference acceptance rate: N/A.
13. Aditya Akella, Bruce Maggs, Srinivasan Seshan, Anees Shaikh and Ramesh Sitaraman. "A Measurement-Based Analysis of Multihoming", *ACM SIGCOMM*, Karlsruhe, Germany, August 2003. Conference acceptance rate: 10% (33/319).
14. Aditya Akella, Shuchi Chawla, Arvind Kannan and Srinivasan Seshan. "Scaling properties of the Internet Graph", *ACM Principles of Distributed Computing (PODC)*, Boston, MA, July 2003. Conference acceptance rate: N/A.

15. Aditya Akella, Ashwin Bharambe, Mike Reiter and Srinivasan Seshan. "Detecting DDoS Attacks on ISP Networks", *SIGMOD Workshop on Management and Processing of Data Streams*, San Diego, CA, June 2003. Conference acceptance rate: N/A.
16. Aditya Akella, Richard Karp, Christos Papadimitriou, Srinivasan Seshan and Scott Shenker. "Selfish Behavior and Stability of the Internet: A Game-Theoretic Analysis of TCP", *ACM SIGCOMM*, Pittsburgh, PA, August 2002. Conference acceptance rate: 8% (25/300).

Posters and Technical Reports

1. Ashok Anand, Fahad Dogar, Dongsu Han, Boyan Li, Hyeontaek Lim, Michel Machado, Wenfei Wu, Aditya Akella, David Andersen, John Byers, Srinivasan Seshan and Peter Steenkiste, "XIA: An Architecture for an Evolvable and Trustworthy Internet", Technical Report CMU-CS-11-100, Department of Computer Science, Carnegie Mellon University, February 2011.
2. Arun Kumar, Ashok Anand, Athula Balachandran, Vyas Sekar, Aditya Akella and Srinivasan Seshan, "Flexible Multimedia Content Retrieval Using InfoNames", *Demo and Poster at ACM SIGCOMM*, New Delhi, India, 2010.
3. Holly Esquivel, Chitra Muthukrishnan, Feng Niu, Shuchi Chawla and Aditya Akella, "RouteBazaar: An Economic Framework for Flexible Routing", UW-Madison CS technical report 1654, April 2009.
4. Ashok Anand, Steven Kappes, Aditya Akella and Suman Nath, "Building Cheap and Large CAMs Using BufferHash", UW-Madison CS technical report 1651, February 2009.
5. Theophilus Benson, Aditya Akella and David Maltz, "Phoenix: A System for Automatically Reconfiguring Networks", *Student Poster at NSDI*, Boston, MA, April 2009.
6. Pratap Ramamurthy, Theo Benson, Jittapat Bunnag, Aditya Akella, Suman Banerjee, Almir Mutapcic and Gireesh Shrimali. "Coordinated Configuration of Uncoordinated Wireless Networks: A Win-win Approach Based on Bargaining", *Student Poster ACM MobiCom*, San Francisco, CA, September 2008.
7. Cristian Estan, Aditya Akella and Suman Banerjee. "A la carte: An Economic Framework for Multi-ISP Service Quality", UW-Madison CS technical report 1591, March 2007.
8. Aditya Akella, Ashwin Bharambe, Suman Nath and Srinivasan Seshan. "Multi-Modal Network Protocols: Adapting to Highly Variable Operating Conditions", CMU Technical Report CMU-CS-02-170, August 2002.
9. Aditya Akella, Shuchi Chawla and Srinivasan Seshan. "Mechanisms for Internet Routing: A Study", CMU Technical Report CMU-CS-02-163, August 2002.
10. Aditya Akella, Srinivasan Seshan, Scott Shenker and Ion Stoica. "Exploring Congestion Control", CMU Technical Report CMU-CS-02-139, July 2002.

Patents Filed

1. "SmartRE: A System for Coordinated Network-wide Caching". Filed July 2009. Co-inventors: Ashok Anand and Vyas Sekar.
2. "Network Routing System Providing Increased Network Bandwidth". June 2009. Co-inventors: Ashok Anand, Aditya Akella and Srinivasan Seshan.
3. "Profiling resource constraints using Mini-Flash Crowds". October 2007. Co-inventors: Pratap Ramamurthy, Vyas Sekar, Balachander Krishnamurthy and Anees Shaikh.

Funded Federal Grants

1. Department of Energy, “dV/dt - Accelerating the Rate of Progress Towards Extreme Scale Collaborative Science”, Lead Institution: UW-Madison (Miron Livny, PI). Award duration: 2012-2015. Total Funding: \$2.1M.
2. NSF Future Internet Architecture, “eXpressive Internet Architecture”. Institutions: CMU (Peter Steenkiste, Lead PI), UW-Madison (Aditya Akella, co-PI), Boston University (John Byers, co-PI). Award duration: 2010-2013. UW-Madison Funding: \$620K.
3. NSF EAGER, “CloudNet”, PI: Aditya Akella. Award Duration: 2010-2012. Total Funding: \$150K.
4. NSF EAGER, “Aster*x”, Institutions: Stanford (Nick McKeown, Lead), UW-Madison (Aditya Akella, co-PI), Georgia Tech (Nick Feamster, co-PI) and University of Washington (Arvind Krishnamurthy, co-PI). Award Duration: 2010-2012. UW-Madison Funding: \$75K.
5. NSF/GPO, “E-GENI Supplement”. PI: Aditya Akella. Award Duration: 2011-2012. UW-Madison Funding: \$50K.
6. NSF, “Network-wide Configuration Testing and Synthesis”. Institutions: UW-Madison (Aditya Akella, co-PI) and GeorgiaTech (Nick Feamster, PI). Award Duration: 2010-2013. UW-Madison Funding: \$250K.
7. NSF/GPO, “E-GENI Campus Trials”. Institutions: Stanford (Nick McKeown: Lead), UW-Madison (Aditya Akella, co-PI), University of Washington (Tom Andersen, co-PI), Princeton (Jennifer Rexford, co-PI), Georgia Tech (Nick Feamster, co-PI), Indiana (Chris Small, co-PI) and Rutgers (Ivan Seskar, co-PI). Award Duration: 2009–2011. UW-Madison Funding: \$300K.
8. NSF Network Science and Engineering, “Collaborative Research: Foundational Issues in Network Redundancy Elimination”. Institutions/PIs: UW-Madison (Aditya Akella, PI, and Shuchi Chawla, Co-PI) and CMU (Srinivasan Seshan, Co-PI). Award Duration: 2009–2012. Total Funding: \$600K.
9. NSF CAREER, “Managing the Complexity of Modern Enterprise Networks”. PI: Aditya Akella. Award Duration: 2008–2012. Total Funding: \$450K.
10. NSF NeTS Future Internet Design (FIND), “Collaborative Research: Designing Secure Networks from the Ground Up”. Institutions/PIs: Stanford University (Nick McKeown - PI, Dan Boneh, David Mazieres and Mendel Rosenblum) and UW-Madison (Aditya Akella, co-PI). Award Duration: 2006–2010. Total Funding: \$1M.

Other Funding and Gifts

I am the lead and only PI on all the grants below.

1. Cisco University Research Program 2011. For “Measurement and Analysis of Data Center Network Architectures”. Gift amount: \$75K.
2. NetApp Faculty Fellowship 2010, for “High Performance Indexes for Content-Based Networked Systems”, Funding Amount: \$40K.
3. WARF Accelerator Award 2009. For “SmartRE: A System for Coordinated Network-wide Caching”. Funding amount: \$50K.
4. Cisco University Research Program 2009. For “A Flexible and Dynamic Information Resolution System for Robust Multimedia Experience in Mobile and Wireless Environments”. Gift amount: \$60K.
5. UW-Madison Graduate School Research Competition. “Building Blocks for Coordinated Management of Heterogeneous Wireless Networks”. 2009-2010. Funding amount: \$34K.

6. Equipment donation from NEC Corporation, 2009. Equipment cost: \$15K.
7. Gift from Microsoft Research Silicon Valley, 2007. Amount: \$10K.
8. Gift from NTT Corporation, 2007. Amount: \$7K.

Professional Service

Program Chair

2012	COMSNETS
2011	HotNets, DIMACS Workshop on Systems and Networking Advances in Cloud Computing
2010	INM/WREN

Organizing Committees

2013	Sigcomm Workshop chair
2011	MobiCom Workshop Chair, Sigcomm Posters/Demos Chair, MC2R Area Editor, COMSNETS Panels Chair
2010	MobiCom Web Chair
2008	HotNets Travel Grants Chair
2006	NSF FIND PI Planning Committee

Program Committees

2013	Sigcomm, Sigmetrics, NSDI, IC2E
2012	CoNEXT, Sigcomm, SECON, Hot-ICE, IMC, ICNP, MobiGames
2011	Sigcomm, NSDI, CoNEXT, COMSNETS, Infocom, HotCloud, HomeNets, ITC, Hot-ICE, SAFECONFIG
2010	PRESTO, Infocom, COMSNETS, WCNC, IFIP Networking
2009	Infocom, COMSNETS
2008	HotNets, NPsec, Infocom
2007	Sigcomm, Infocom
2006	Sigcomm, CoNEXT student workshop

NSF Panels

2010	NetSE
2008	CRI, CyberTrust
2007	CRI
2006	Networks of Sensor Systems, Networking Broadly Defined

Selected Invited Talks

1. "Rethinking Wireless Content Overhearing", Cornell University, May, 2012.
2. "Toward a Cloud Networking Platform for Enterprise Applications", Dell, October 2011.
3. "Network Traffic Characteristics of Data Centers in the Wild", AMD, October 2011.

4. "Fast and Scalable Approximate Key Look-ups", DIMACS, October 2010.
5. "Cheap and Large CAMs for High Performance Data-Intensive Networked Systems", MSR India, August 2010.
6. "Redundancy Elimination as a Network-wide Service", IIT Bombay, August 2010.
7. "Redundancy Elimination as a Network-wide Service", IIT Delhi, August 2010.
8. "Redundancy Elimination as a Network-wide Service", Riverbed Networks, April 2010.
9. "Understanding and Mitigating Complexity in Network Configuration and Management", MSR-India Networking Day, January 2010.
10. "OpenFlow Initiatives at UW-Madison", OMIS Working Group, GENI Engineering Conference, November 2009.
11. "Understanding and Mitigating Complexity in Network Configuration and Management", DIMACS Workshop on Designing Networks for Manageability, November 2009.
12. "Data-center Traffic Characteristics and the Need for Fine-grained Traffic Engineering", Google Madison, November 2009.
13. "Redundancy Elimination as an In-network Service", Georgia Tech, October 2009.
14. "Application-oriented Networking", NSF Future Internet Summit, Lightning talk, October 2009.
15. "Content-based Network Architectures", NSF Future Internet Summit, October 2009.
16. "A Peek into Data-center Traffic Characteristics", Cisco Routing Symposium, October 2009.
17. "OpenFlow Initiatives at UW-Madison", OpenFlow/Stanford Clean-Slate Workshop, August 2009.
18. "Building Cheap and Large Streaming Indexes Using Flash", First GENI Measurement Workshop, Madison, WI, June 2009.
19. "Managing the Complexity of Modern Enterprise Networks", Princeton University, March 2009.
20. "Redundancy Elimination as a Network-wide Service", NSF FIND PI meeting, April 2009.
21. "Redundancy Elimination as a Network-wide Service", Keynote at NYMAN Workshop, Columbia University, March 2009.
22. "Packet Caches on Routers: The Implications of Universal Redundant Traffic Elimination", Cisco Systems, September 2008.
23. "Packet Caches on Routers: The Implications of Universal Redundant Traffic Elimination", HP Labs, September 2008.
24. "Remote Profiling of Web Servers Using Mini-Flash Crowds", Google Inc, December 2007.
25. "New Directions in Enterprise Network Management", Department of Information Technology, UW-Madison, December 2006.
26. "New Directions in Enterprise Network Management", Microsoft Research EdgeNet Summit, June 2006.
27. "Self-Management in Chaotic Wireless Networks", Stanford University, February 2006.
28. "Self-Management in Chaotic Wireless Networks", International Computer Science Institute, November 2005.

Advisees (current and past)

1. Yizheng Chen: Network-aware resource allocation primitives in Clouds.
2. Aaron Gember: Cellular network management.
 - NSF Graduate Research Fellowship Honorable Mention.
3. Robert Grandl: Transport evolution in the eXpressive Internet Architecture.
4. Shan-Hsiang Shen: Content-aware protocol and application design.
5. Wenfei Wu: Low latency flow scheduling in data centers.

Ph.D. Alumni

1. Ashok Anand.Redundancy elimination, Content-aware networking
 - Google PhD Fellowship recipient.
 - PhD, January 2012. Thesis: “Redundancy Elimination as a Primitive”
 - Researcher at Bell Labs, India.
2. Theophilus Benson
 - IBM PhD Fellowship recipient, Harry Cochrane/Cal White IBM Ph.D. Assitanship, AOF Fellow.
 - PhD, June 2012. Thesis: “New Paradigms for Managing the Complexity and Improving the Performance of Enterprise Networks”
 - Assistant Professor in CS at Duke University starting Fall 2012

Masters Alumni

1. Holly Esquivel, MS, June 2010: Economic foundations for routing. NDSEG Fellow. Now at Epic Systems, Inc.
2. Chitra Muthukrishnan, MS, May 2010: Annotated networking. Now at Data Domain, Inc.
3. Archit Gupta, MS, May 2007: Malware evolution, measuring traffic redundancy. Now at Data Domain, Inc.
4. Pratap Ramamurthy, MS, December 2008: Wireless network design using Nash Bargaining. Now at Cisco Systems.

Collaborators

Within UW: Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, Suman Banerjee, Paul Barford, Shuchi Chawla, Stark Draper.

Outside UW: Dave Andersen (CMU), John Byers (BU), Ramon Caceres (ATT Research), Balachander Krishnamurthy (AT&T), Fabian Kuhn (ETH Zurich), David Maltz (MSR-Redmond), Dahlia Malkhi (MSR-SVC), Tatsuya Mori (NTT), Suman Nath (MSR-Redmond), Jeff Pang (ATT Research), Vern Paxson (ICSI/UC Berkeley), Rama Ramasubramanian (MSR-SVC), Ram Ramjee (MSR-India), Vyas Sekar (Intel), Srinivasan Seshan (CMU), Aman Shaikh (ATT Research), Anees Shaikh (IBM Research), Scott Shenker (UC Berkeley), Peter Steenkiste (CMU), George Varghese (UCSD), Ming Zhang (MSR)

Teaching

1. Fall 2006: CS640 – Introduction to Computer Networks
 - 25 students; Rating: 3.80/5

2. Spring 2007: CS740 – Advanced Computer Networking
 - 17 students; Rating: 4.14/5
3. Fall 2007: CS640 – Introduction to Computer Networks
 - 33 students; Rating: 3.95/5
4. Spring 2008: CS740 – Advanced Computer Networking
 - 11 students; Rating: 4.00/5
5. Fall 2008: CS740 – Advanced Computer Networking
 - 16 students; Rating: 4.64/5
6. Fall 2009: CS838 – Rethinking the Internet Architecture: From Theory to Practice
 - 17 students enrolled; Rating: 4.86/5
7. Spring 2010: CS740 – Advanced Computer Networking
 - 25 students enrolled; Rating: 4.33/5
8. Fall 2010: CS640 – Introduction to Computer Networks
 - 44 students enrolled; Rating: 4.36/5
9. Spring 2011: CS740 – Introduction to Computer Networks
 - 22 students enrolled; Rating: 4.5/5
11. Spring 2012: CS740 – Introduction to Computer Networks
 - 21 students currently enrolled; Rating: 4.89/5