Dan Rubenstein

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Department of Computer Science
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Education

University of Massachusetts Amherst — Amherst, MA
Ph.D. in Computer Science — Sep., 2000
Advisors: Prof. Jim Kurose and Prof. Don Towsley

University of California Los Angeles — Los Angeles, CA
M.A. in Mathematics — Jun., 1994

Massachusetts Institute of Technology — Cambridge, MA
B.S. in Mathematics — May, 1992

Professional Employment

Columbia University — New York, NY
- **Professor**, Dept of Computer Science — Jul. 2020 - Present
- **Associate Professor**, Department of Computer Science — Jun. 2005 – Jun. 2020
- **Associate Professor**, Department of Electrical Engineering — Jun. 2005 – Jun. 2009
- **Assistant Professor**, Department of Computer Science — Jan. 2001 – May 2005
- **Assistant Professor**, Department of Electrical Engineering — Sep. 2000 – May 2005

Google, Inc. — New York, NY
Research Scientist — Mar. 2023 - Present

Google, Inc. — New York, NY
Visiting Scientist — Jan. 2020 - Jan. 2023
Jan. 2011 – Nov. 2011

Infinio (formerly SilverLining Systems) — New York, NY
Co-Founder and Former Chief Scientist — Nov. 2011 – Present

University of Massachusetts — Amherst, MA
Research Assistant, Computer Networks Research Group — Jan.1997 –Aug. 2000

AT&T Research Laboratories — Florham Park, NJ
Summer Intern, Networking and Distributed Systems Center — Jun.–Sep. 1999

Bell Laboratories, Lucent Technologies — Holmdel, NJ

Summer Intern, High Speed Networking Department Jun.–Aug. 1997

University of Massachusetts Amherst, MA
Research Assistant, Lab for Advanced Software Eng. Rsch, Sep. 1994 – Dec. 1996,

Honors and Awards

- Fellow, IEEE, 2019
- Senior Member, IEEE, 2017
- Elected Member, IFIP Working Group 7.3 on Computer Performance Modeling and Analysis, 2005.
- IBM Faculty Award, 2004.
- NSF CAREER Award, July 2002 - June 2007.
- "Best Paper" Awards: IEEE LANMAN 2019 Conference, ACM CoNext 2008 and 2016 Conference, IEEE 2011 Outstanding Paper on New Communication Topics, IEEE ICNP 2003 Conference.
- "Best Student Paper" Award, ACM SIGMETRICS Conference, June 2000.
- SRC Graduate Finalist, Sigcomm 2010 Demo Competition, "Best Student Demo" Award, ACM Mobicom/Mobihoc 2007 Conference (co-Advisor of student winner, Josh Reich)

Professional Positions

- Editorships
  - Editor, IEEE/ACM Transactions on Networking, 2007-2012.
  - Guest Editor, International Journal of Performance Evaluation, Special Issue on Peer-to-Peer Networking
- Member of ACM's Best Dissertation Committee: 2021, 2022
- Member of "Test of Time" Award, ACM Sigmetrics: 2021 (Chair)
- Member of Selection Committee: ACM Sigmetrics "Rising Star Award" 2008, 2009, 2010 (Chair), 2019 (Chair), 2020
- Member, Grant Review Panels, NSF, approximately one per year.
- Executive Program Committee Membership
  - General Chair, IEEE UEMCON 2019
  - General Chair, IFIP Performance 2017
  - Program Co-Chair, ACM Sigmetrics 2011
  - Program Co-Chair, IFIP Networking 2010

  - Area Progam Chair, IEEE ICNP 2008
  - Area Progam Chair, IEEE Infocom 2008, 2010

- Program Committee Memberships:

  - IEEE MASCOTS 2020
  - IFIP Networking 2010 (Program Co-chair)
  - IEEE DCOSS 2010
  - ACM NetEcon 2009, 2010, 2013
  - IEEE IPSN 2009
  - IEEE COMSNETS 2009
  - ACM SIGCOMM 2004
  - ACM CoNext 2009, 2013
  - ACM SIGMETRICS 2001, 2005, 2006, 2007, 2008, 2009, 2010, 2011 (co-Chair), 2013, 2015, 2016, 2017, 2018, 2019
  - IEEE Infocom 2005, 2006, 2007, 2008, 2009, 2010, 2024
  - IFIP Performance 2007, 2013
  - ACM PODC 2008
  - IEEE NetDB 2008
  - IEEE Globecom Global Internet 2004
  - IEEE International Conference on Network Protocols (ICNP) 2002, 2003, 2004, 2008, 2015
  - IEEE OpenArch Workshop 2003
  - IEEE Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV) 2001, 2002
  - International Workshop on Networked Group Communication (NGC) 2002
  - New York Metro Area Networking Workshop 2001
  - SPIE Conference on Multimedia Computing and Networking (MMCN) 2003
  - Usenix NDSI 2006

- Conference Organization

  - Tutorials Chair, IEEE Infocom 2006
  - Student Travel Grant Chair, ACM SIGCOMM 2003
  - Publicity Chair, ACM SIGMETRICS 2003
  - Co-chair, New York Metro Area Networking Workshop 2002
  - Co-chair, Opensig 2003 Workshop

- Member ACM, Fellow IEEE

Publications

- Journal Publications

1. Niloofar Bayat, Richard T.B. Ma, Vishal Misra, Dan Rubenstein, **Big Winners and Small Losers of Zero-rating**, *ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS)*, Volume 7, No. 1, 2022.
2. Niloofar Bayat, Vishal Misra, Dan Rubenstein, **Down for Failure: Active Power Status Monitoring**, *Future Generation Computer Systems*, Volume 125, December 2021.
3. Niloofar Bayat, Richard Ma, Vishal Misra, Dan Rubenstein, **Zero-Rating and Net Neutrality: Who Wins, Who Loses?**, *ACM SIGMETRICS Performance Evaluation Review*, Volume 48, No. 3, 2021.
4. Tingjun Chen, Javad Ghaderi, Dan Rubenstein, Gil Zussman, **Maximizing Broadcast Throughput Under Ultra-Low-Power Constraints**, *IEEE/ACM Transactions on Networking*, Volume 26, No. 2, April 2018.
5. Rob Margolies, Guy Grebla, Tingjun Chen, Dan Rubenstein and Gil Zussman, "Panda: Neighbor Discovery on a Power Harvesting Budget", **IEEE Journal on Selected Areas in Communications (JSAC), Series on Green Communications and Networking**, Volume 34, Issue 12, December 2016
6. Kyung-Wook Hwang, Vijay Gopalakrishnan, Rittwik Jana, Seungjoon Lee, Visha Misra, K. K. Ramakrishnan, and Dan Rubenstein, **Joint-Family: Adaptive BitRate Video-on-Demand Streaming over Peer-to-Peer Networks with Realistic Abandonment Patterns**, *Journal of Computer Networks*, September, 2016.
7. Joshua Reich, Vishal Misra, Dan Rubenstein, Gil Zussman, **Connectivity Maintenance in Mobile Wireless Networks via Constrained Mobility**, *IEEE Journal on Selected Areas in Communications (JSAC)*, Volume 30, number 5, June 2012.
8. Richard T.B. Ma, Dahming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **On Cooperative Settlement Between Content, Transit and Eyeball Internet Service Providers**, *IEEE/ACM Transactions on Networking*, Volume 19, Number 3, June 2011.
9. Maria Gorlatova, Peter Kinget, Ioannis Kymissis, Dan Rubenstein, Xiaodong Wang and Gil Zussman, **Energy Harvesting Active Networked Tags (EnHANTs) for Ubiquitous Object Networking**, *IEEE Wireless Communications*, Volume 17, Number 6, pp. 18-25, December, 2010, **Awarded 2011 Outstanding Paper on New Communication Topics.**
10. Eli Brosh, Salman Abdul Baset, Vishal Misra, Dan Rubenstein, and Henning Schulzrinne, **The Delay-Friendliness of TCP for Real-time Traffic**, *IEEE/ACM Transactions on Networking*, Volume 18, Number 5, pp. 1478-1491, 2010.
11. Richard T.B. Ma, Dah Ming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **Internet Economics: The use of Shapley value for ISP settlement**, *IEEE/ACM Transactions on Networking*, Volume 18, Number 3, pp. 775-787, 2010.
12. Patrick P. C. Lee, Vishal Misra and Dan Rubenstein, **Toward Optimal Network Fault Correction in Externally Managed Overlay Networks**, *IEEE Transactions on Parallel and Distributed Systems*, Volume 21, Number 3, pp. 354-366, 2010.

13. P. Bahl, R. Chandra, P.P.C. Lee, V. Misra, J. Padhye, D. Rubenstein and Y. Yu, **Opportunistic Use of Client Repeaters to Improve Performance of WLANs** , *IEEE/ACM Transactions on Networking*, Volume 17, Number 4, pp. 1160-1171, August, 2009.
14. Tianbai Ma, Vishal Misra, and Dan Rubenstein, **An Analysis of Generalized Slotted-Aloha Protocols**, *IEEE/ACM Transactions on Networking*, Volume 17, Number 3, 2009. This is an extended version of an IEEE ICDCS 2006 conference paper listed below.
15. Patrick P. C. Lee, Vishal Misra and Dan Rubenstein, **Distributed Algorithms for Secure Multipath Routing in Attack-Resistant Networks**, *IEEE/ACM Transactions on Networking*, Volume 15, Number 6, December, 2007. This is an extended version of an IEEE Infocom 2005 conference paper listed below.
16. Daniel Villela, Prashant Pradhan and Dan Rubenstein, **Provisioning Servers in the Application Tier for E-commerce Systems**, *ACM Transactions on Internet Technology*, Volume 7, Number 1, February, 2007. This is an extended version of an IEEE IWQoS 2004 conference paper listed below.
17. Raj Kumar Rajendran and Dan Rubenstein, **Optimizing the Quality of Scalable Video Streams on P2P Networks**, *Journal of Computer Networks*, Volume 50, Number 15, pp. 2641 - 2658, October, 2006. This is an extended version of an IEEE Globecom 2004 conference paper listed below.
18. Daniel Villela and Dan Rubenstein, **Performance Analysis of Server Sharing Collectives for Content Distribution**, *IEEE Transactions on Parallel and Distributed Systems*, Volume 16, Number 12, pp. 1178-1189, December, 2005. This is an extended version of an IEEE IWQoS 2002 conference paper listed below.
19. Angelos Stavrou, Debra L. Cook, William G. Morein, Angelos D. Keromytis, Vishal Misra and Dan Rubenstein, **WebSOS: An Overlay-based System For Protecting Web Servers From Denial of Service Attacks**, *Journal of Communication Networks*, Volume 48, Number 5, August, 2005.
20. Micah Adler and Dan Rubenstein, **Pricing Multicast in More Practical Network Models**, *ACM Transactions on Algorithms*, Volume 1, Number 1, November, 2005. This is an extended version of an ACM SODA 2002 conference paper listed below.
21. Bong-Jun Ko and Dan Rubenstein, **A Distributed, Self-stabilizing Protocol for Placement of Replicated Resources in Emerging Networks**, *IEEE/ACM Transactions on Networking*, Volume 13, Number 3, June, 2005. This is an extended version of an IEEE ICNP 2003 conference paper listed below.
22. Dan Rubenstein and Sambit Sahu, **Can Unstructured P2P Protocols Survive Flash Crowds?**, *IEEE/ACM Transactions on Networking*, Volume 13, Number 3, June, 2005.
23. Angelos Stavrou, Dan Rubenstein and Sambit Sahu, **A Lightweight, Robust, P2P System to Handle Flash Crowds**, *IEEE Journal on Selected Areas in Communications (JSAC), special issue on Service Overlay Networks*, Volume 22, Number 1, January, 2004. This is an extended version of an IEEE ICNP 2002 conference paper listed below.
24. Dan Rubenstein, Sneha Kasera, Don Towsley and Jim Kurose., **Improving Reliable Multicast Using Active Parity Encoding Services (APES)**, *Journal of Computer Networks*, Volume 44, Number 1, January, 2004. This is an extended version of an IEEE Infocom 1999 conference paper listed below.

25. Angelos Keromytis, Vishal Misra and Dan Rubenstein, **SOS: An Architecture for Mitigating DDoS Attacks**, *IEEE Journal on Selected Areas in Communications (JSAC), special issue on Service Overlay Networks*, Volume 22, Number 1, January, 2004. This is an extended version of an ACM SIGCOMM 2002 conference paper listed below.
26. Yuliy Baryshnikov, Ed Coffman, Predrag Jelenkovic, Petar Momcilovic and Dan Rubenstein, **Flood Search Under the California Split Rule**, *Operations Research Letters*, Volume 32, Number 3, May, 2004.
27. Dan Rubenstein, Jim Kurose and Don Towsley, **Detecting Shared Congestion of Flows Via End-to-end Measurement**, *IEEE/ACM Transactions on Networking*, Volume 10, Number 3, June, 2002. This is an extended version of an ACM SIGMETRICS 2000 conference paper listed below.
28. Dan Rubenstein, Jim Kurose and Don Towsley, **The Impact of Multicast Layering on Network Fairness**, *IEEE/ACM Transactions on Networking*, Volume 10, Number 2, April, 2002. This is an extended version of an ACM SIGCOMM 1999 conference paper listed below.
29. Dan Rubenstein, Jim Kurose and Don Towsley, **A Study of Proactive Hybrid FEC/ARQ and Scalable Feedback Techniques for Reliable Real-Time Multicast**, *Computer Communications Journal*, March, 2001.
30. Dan Rubenstein, Jim Kurose, and Don Towsley, **Optimistic Parallel Simulation of Reliable Multicast Protocols**, *ACM Performance Evaluation Review*, Volume 25, Number 4, pp. 22-29, March, 1998.
31. Dan Rubenstein, **Catalan Numbers Revisited**, *Journal of Combinatorial Theory, Series A*, pp. 486-490, November, 1994.

- Conference Publications

1. Kahlil A Dozier, Loqman Salamatian, Dan Rubenstein, **Analysis of False Negative Rates for Recycling Bloom Filters (Yes, They Happen!)**, *Proceedings of ACM SIGMETRICS*, Venice, Italy, June, 2024.
2. Kahlil A Dozier, Loqman Salamatian, Dan Rubenstein, **Modeling Average False Positive Rates of Recycling Bloom Filters**, *Proceedings of IEEE Infocom*, Vancouver, Canada, May, 2024.
3. Niloofar Bayat, Vishal Misra, Dan Rubenstein, **Bandwidth Allocation Games**, arXiv preprent arXiv:2204.12588, 2022.
4. Kunal Mahajan, Daniel R Figueiredo, Vishal Misra and Dan Rubenstein, **Optimal Pricing for Serverless Computing**, *IEEE Global Communications Conference (Globecom 2019)*, Waikoloa, HI, USA, December, 2019.
5. Yudong Yang, Yuming Jiang, Vishal Misra and Dan Rubenstein, **Virtual Wires: Rethinking WiFi networks**, *IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN)*, Paris, France, July, 2019. **Best Paper Award Recipient.**
6. Yudong Yang, Vishal Misra and Dan Rubenstein, **A Modeling Approach to Classifying Malicious Cloud Users via Shuffling**, *MAMA 2018 Workshop*, Irvine, CA, June, 2018.
7. Alexandr Andoni, Javad Ghaderi, Daniel Hsu, Dan Rubenstein, and Omri Weinstein, **Coding with Asymmetric Prior Knowledge**, arXiv preprint arXiv:1707.04875. July, 2017.
8. Tingjun Chen, Javad Ghaderi, Dan Rubenstein, Gil Zussman, **Performance Evaluation of Energy-Contstrained Broadcast (EconCast) in Wireless Networks**, *Proceedings of IEEE WCNC'17 Workshop on Energy Harvesting and Remotely Powered Wireless Communications for the IoT*, San Francisco, CA, March, 2017 **Invited Paper**
9. Tingjun Chen, Javad Ghaderi, Dan Rubenstein, Gil Zussman, **Maximizing Broadcast Throughput Under Ultra-Low-Power Constraints**, *Proceedings of 2016 ACM Conference on Emerging network experiment and technology (CoNEXT)*, Irvine, CA, December, 2016. **Best Paper Award Recipient.**
10. Robert Margolies, Guy Grebla, Tingjun Chen, Dan Rubenstein, Gil Zussman, **Panda: Neighbor Discovery on a Power Harvesting Budget**, *Proceedings of IEEE Infocom*, San Francisco, CA, April, 2016.
11. Yudong Yang, Vishal Misra, Dan Rubenstein, **On the Optimality of Greedy Garbage Collection Algorithms for SSDs**, *The Workshop on MAthematical performance Modeling and Analysis (MAMA)*, Portland, OR, June, 2015.
12. Kyung-Wook Hwang, Vijay Gopalakrishnan, Seungjoon Lee, Vishal Misra, K. K. Ramakrishnan, and Dan Rubenstein, **Joint-Family: Enabling Adaptive Bitrate Streaming in Peer-to-Peer Video-on-Demand**, *Proceedings of the 21st IEEE Internation Conference on Network Protocols (ICNP 2013)*, Goettingen, Germany, October, 2013.
13. Joshua Reich, Oren Laaden, Eli Brosh, Alex Sherman, Vishal Misra, Jason Nieh, and Dan Rubenstein, **VMTorrent: Scalable P2P Virtual Machine Streaming**, *Proceedings of 2012 ACM Conference on Emerging network experiment and technology (CoNEXT)*, Nice, France, December, 2012.

14. Richard T. B. Ma, Dah Ming Chiu, John Chi Shing Lui, Vishal Misra and Dan Rubenstein, **Price Differentiation in the Kelly Mechanism"**, *W-PIN 2012: The first Workshop on Pricing and Incentives in Networks (extended abstract)*, London, UK, June, 2012.
15. Seung Geol Choi, Kyung-Wook Hwang, Jonathan Katz, Tal Malkin and Dan Rubenstein, **Secure Multi-Party Computation of Boolean Circuits with Applications to Privacy in On-Line Marketplaces**, *CT-RSA*, San Francisco, CA, February, 2012.
16. Josh Reich, Vishal Misra, Dan Rubenstein and Gil Zussman, **Connectivity Maintenance in Mobile Wireless Networks via Constrained Mobility**, *Proceedings of IEEE Infocom*, Shanghai, China, April, 2011.
17. Joshua Reich, Oren Laadan, Eli Brosh, Alex Sherman, Vishal Misra, Jason Nieh and Dan Rubenstein, **VMTorrent: Virtual Appliances On-Demand (Extended Abstract)**, *ACM SIGCOMM*, New Delhi, India, August, 2010, **SRC: Graduate Finalist.**
18. Maria Gorlatova, Tarun Sharma, Deep Shrestha, Enlin Xu, Jiasi Chen, Abraham Skolnik, Dongzhen Piao, Peter Kinget, John Kymissis, Dan Rubenstein and Gil Zussman, **Prototyping Energy Harvesting Active Networked Tags (EnHANTs) with MICA2 Motes**, *IEEE Secon 2010*, Boston, MA, June, 2010.
19. Patrick P.C. Lee, Vishal Misra and Dan Rubenstein, **On the Robustness of Wireless Opportunistic Routing Toward Inaccurate Link-Level Measurements**, *COMSNETS*, Bangalore, India, January, 2010 (Invited Paper).
20. Maria Gorlatova, Peter Kinget, Ioannis Kymissis, Dan Rubenstein, Xiaodong Wang and Gil Zussman, **Challenge: Ultra-Low-Power Energy-Harvesting Active Networked Tags (EnHANTs)**, *Proceedings of ACM MOBICOM 2009*, Beijing, China, September, 2009.
21. Victor Bahl, Ranveer Chandra, Patrick P. C. Lee, Vishal Misra, Jitendra Padhye, Dan Rubenstein and Yan Yu, **Opportunistic Use of Client Repeaters to Improve Performance of WLANs**, *Proceedings of 2008 ACM Conference on Emerging network experiment and technology (CoNEXT)*, Madrid, Spain, December, 2008, **Best Paper Award Recipient.**
Acceptance Rate: 29/166 (17.5%)
22. Richard T.B. Ma, Dahming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **On Cooperative Settlement Between Content, Transit and Eyeball Internet Service Providers**, *Proceedings of 2008 ACM Conference on Emerging network experiment and technology (CoNEXT)*, Madrid, Spain, December, 2008.
Acceptance Rate: 29/166 (17.5%)
23. Richard T.B. Ma, Dah-ming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **Interconnecting Eyeballs to Content: A Shapley Value Perspective on ISP Peering and Settlement**, *ACM NetEcon*, Seattle, WA, August, 2008.
24. Salman Baset, Eli Brosh, Dan Rubenstein, Henning Schulzrinne, **The Delay Friendliness of TCP**, **ACM SIGMETRICS**, Annapolis, MD, June 2008.
Acceptance Rate: 36/201 (17.9%)
25. Richard Ma, Dah Ming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **Internet Economics: The Use of Shapley Value for ISP Settlement**, *A*CM CoNEXT, New York, NY, December 2007.
Acceptance Rate: 28/138 (20.3%)

26. Abhinav Kamra, Vishal Misra and Dan Rubenstein, **CountTorrent: Ubiquitous Access to Query Aggregates in Dynamic and Mobile Sensor Networks**, *ACM SenSys*, Sydney, Australia, November, 2007.
Acceptance Rate: 25/149 (16.8%)
27. Hoon Chang, Vishal Misra and Dan Rubenstein, **Fairness and Physical Layer Capture in Random Access Networks**, *Proceedings of IEEE SECON: Fourth Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks*, San Diego, CA, U.S.A., June, 2007.
Acceptance Rate: 63/296 (23.1%)
28. Raj Kumar Rajendran, Vishal Misra and Dan Rubenstein, **Theoretical Bounds on Control-Plane Self-Monitoring in Routing Protocols**, *Proceedings of ACM SIGMETRICS*, San Diego, CA, June, 2007.
Acceptance Rate: 29/170 (17.0%)
29. Hanhua Feng, Vishal Misra and Dan Rubenstein, **PBS: A Unified Priority-Based Scheduler**, *Proceedings of ACM SIGMETRICS*, San Diego, CA, June, 2007.
Acceptance Rate: 29/170 (17.0%)
30. Patrick P. C. Lee, Vishal Misra and Dan Rubenstein, **Toward Optimal Network Fault Correction via End-to-End Inference**, *IEEE Infocom*, Anchorage, Alaska, USA, May, 2007.
Acceptance Rate: 252/$>$ 1400 *(*$\sim$*18%)*
31. Vishnu Navda, Aniruddha Bohra, Samrat Ganguly, Rauf Izmailov and Dan Rubenstein, **Using Channel Hopping to Increase 802.11 Resilience to Jamming Attacks**, *IEEE Infocom Minisymposium*, Anchorage, AK, May, 2007.
Acceptance Rate:(25%)
32. Bong-Jun Ko, Vishal Misra, Jitendra Padhye and Dan Rubenstein, **Distributed Channel Assignment in Multi-Radio 802.11 Mesh Networks**, *IEEE Wireless Communications and Networking Conference (WCNC) 2007*, Hong Kong, March, 2007.
Acceptance Rate: 815/1721 (47.4%)
33. Hoon Chang, Vishal Misra and Dan Rubenstein, **Exploiting Opportunistic Packet Delivery for Rate Control in 802.11 Wireless Networks**, *IEEE ICCS: Tenth IEEE International Conference on Communication Systems*, October, 2006.
34. Abhinav Kamra, Jon Feldman, Vishal Misra and Dan Rubenstein, **Growth Codes: Maximizing Sensor Network Data Persistence**, *Proceedings of ACM SIGCOMM*, Pisa, Italy, September, 2006.
Acceptance Rate: 37/200-300 (12.3-18.5%)
35. Raj Kumar Rajendran, Vishal Misra and Dan Rubenstein, **Control Plane Resilience: The Method of Strong Detection**, *Control Plane Resilience: The Method of Strong Detection*, Allerton 2006, September, 2006.
36. Rakesh Kumar, David Yao, Amitabha Bagchi, Keith Ross and Dan Rubenstein, **Fluid Modeling of Pollution Proliferation in P2P Networks**, *Proceedings of ACM SIGMETRICS*, St. Malo, France, June, 2006. 12 pages.
Acceptance Rate: 28/165 (17.0%)
37. Daniel Villela, Vishal Misra, Dan Rubenstein and Sambit Sahu, **Impact of Load Sharing on Provisioning Services**, *Proceedings of IEEE Infocom*, Barcelona, Spain, April, 2006. 12 pages.
Acceptance Rate: 252/$>$*1400 (*$\sim$*18%)*

38. Hoon Chang, Vishal Misra and Dan Rubenstein, **A General Model and Analysis of Physical Layer Capture in 802.11 Networks**, *Proceedings of IEEE Infocom*, Barcelona, Spain, April, 2006. 12 pages.
Acceptance Rate: 252/>1400 (∼18%)
39. Richard T.B. Ma, Vishal Misra and Dan Rubenstein, **Modeling and Analysis of Generalized Slotted-Aloha MAC Protocols in Cooperative, Competetive and Adversarial Environments**, *ICDCS*, Lisboa, Portugal, July, 2006. 8 pages.
Acceptance Rate: 75/540 (13.8%)
40. Abhinav Kamra, Jon Feldman, Vishal Misra and Dan Rubenstein, **Encoding for Persistent Sensor Networks**, *Allerton Conference on Communication, Control and Computing*, September, 2005.
41. Raj Kumar Rajendran, Vishal Misra and Dan Rubenstein, **Brief Announcement: Strong Detection of Misconfigurations**, *Principles of Distributed Computing (PODC)*, Las Vegas, NV, July, 2005.
42. Abhinav Kamra, Jon Feldman, Vishal Misra and Dan Rubenstein, **Data Persistence in Sensor Networks: Towards Optimal Encoding for Data Recovery in Partial Network Failures**, *Workshop on MAthematical performance Modeling and Analysis*, June, 2005.
43. Richard T.B. Ma, Vishal Misra and Dan Rubenstein, **Cooperative and Non-cooperative Models for slotted-Aloha type MAC protocols**, *ACM SIGMETRICS Performance Evaluation Review*, Volume 33, Number 2, pp. 30-32, 2005.
44. Patrick P. C. Lee, Vishal Misra and Dan Rubenstein, **Distributed Algorithms for Secure Multipath Routing**, *Proceedings of IEEE Infocom*, Miami, FL, March, 2005. 12 pages. This is also extended in a Transactions on Networking journal paper.
Acceptance Rate: 244/1419 (17.2%)
45. Micah Adler, Rakesh Kumar, Keith W. Ross, Dan Rubenstein, Torsten Suel and David. D. Yao, **Optimal Peer Selection for P2P Downloading and Streaming**, *Proceedings of IEEE Infocom*, Miami, FL, March, 2005. 12 pages.
Acceptance Rate: 244/1419 (17.2%)
46. Hanhua Feng, Vishal Misra and Dan Rubenstein, **Optimal state-free, size-aware dispatching for heterogeneous M/G/-type systems**, *Performance Evaluation (Proceedings of Performance 2005)*, Volume 62, Number Issues 1-4, October, 2005. 8 pages.
47. Angelos Stavrou, Angelos D. Keromytis, Jason Nieh, Vishal Misra and Dan Rubenstein, **MOVE: An End-to-End Solution To Network Denial of Service**, *Proceedings of the Internet Society (ISOC) Symposium on Network and Distributed Systems Security (SNDSS)*, San Diego, CA, February, 2005. 16 pages.
Acceptance Rate:(12.9%)
48. Yuliy Baryshnikov, Ed G. Coffman, Guillaume Pierre, Dan Rubenstein, Mark Squillante and Teddy Yimwadsana, **Predictability of Web-Server Traffic Congestion**, *10th International Workshop on Web Content Caching and Distribution (WCW 2005)*, Sophia Antipolis, France, September, 2005. 7 pages.
49. Angelos Stavrou, John Ioannidis, Angelos D. Keromytis, Vishal Misra and Dan Rubenstein, **A Pay-per-Use DoS Protection Mechanism For The Web**, *In Proceedings of the 2nd Applied Cryptography and Network Security (ACNS) Conference*, Yellow Mountain, China, June, 2004.

15 pages.
Acceptance Rate:(12.1%)

50. Raj Kumar Rajendran and Dan Rubenstein, **Extended Abstract: Optimizing the Quality of scalable video streams on P2P Networks**, *ACM SIGMETRICS*, New York, NY, June, 2004.
51. Daniel Villela, Prashant Pradhan and Dan Rubenstein, **Provisioning Servers in the Application Tier for E-commerce Systems**, *Proceedings of the Twelfth IEEE International Workshop on Quality of Service (IWQoS 2004)*, Montreal, Canada, June, 2004. 10 pages. This is also extended in a Transactions on Internet Technology 2007 journal paper.
Acceptance Rate: 24/154 (19.5%)
52. John Lui, Vishal Misra and Dan Rubenstein, **On the Robustness of Soft State Protocols**, *12th IEEE International Conference on Network Protocols (ICNP)*, Berlin, Germany, October, 2004. 11 pages.
Acceptance Rate: 33/213 (15.5%)
53. Raj Kumar Rajendran and Dan Rubenstein, **Optimizing the Quality of scalable video streams on P2P Networks**, *IEEE Globecom*, Dallas, TX, November, 2004. 7 pages. This is also extended in a Journal of Computer Networks 2006 journal paper.
Acceptance Rate: 792/2086 (37.7%)
54. Bong-Jun Ko and Dan Rubenstein, **A Distributed, Self-stabilizing Protocol for Placement of Replicated Resources in Emerging Networks**, *Proceedings of the 11th IEEE International Conference on Network Protocols (ICNP)*, Atlanta, GA, Nov, 2003, **Best Paper Award Recipient.** 10 pages. This is also extended in a Transactions on Networking 2005 journal paper.
Acceptance Rate: 30/230 (13%)
55. William G. Morein, Angelos Stavrou, Debra L. Cook, Angelos D. Keromytis, Vishal Misra and Dan Rubenstein, **Using Graphic Turing Tests to Counter Automated DDoS Attacks Against Web Servers**, *Proceedings of the 10th ACM International Conference on Computer and Communications Security (CCS)*, Washington D.C., Oct, 2003. 12 pages.
Acceptance Rate:(13.8%)
56. Zhen Liu, Naceur Malouch, Vishal Misra, Dan Rubenstein and Sambit Sahu, **Bandwidth-Sharing Schemes for Multiple Multi-Party Sessions**, *Proceedings of the 18th International Teletraffic Congress (ITC 18)*, Berlin, Germany, September, 2003.
57. Daniel Villela and Dan Rubenstein, **A Queueing Analysis of Server Sharing Collectives for Content Distribution**, *Proceedings of the Eleventh IEEE International Workshop on Quality of Service (IWQoS 2003)*, Monterey, CA, June, 2003. 10 pages.
58. Angelos Keromytis, Vishal Misra and Dan Rubenstein, **SOS: Secure Overlay Services**, *Proceedings of ACM SIGCOMM*, Pittsburgh, PA, August, 2002. 12 pages. This is also extended in a JSAC 2004 journal paper.
Acceptance Rate: 25/300 (8.3%)
59. Angelos Stavrou, Dan Rubenstein and Sambit Sahu, **A Lightweight, Robust P2P System to Handle Flash Crowds**, *In Proceedings of IEEE ICNP 2002*, Paris, France, November, 2002. 10 pages. This is also extended in a JSAC 2004 journal paper.
Acceptance Rate: 32/217 (13%)
60. Naceur Malouch, Zhen Liu, Dan Rubenstein and Sambit Sahu, **A Graph Theoretic Approach to Bounding Delay in Proxy-Assisted, End-System Multicast**, *In Proceedings of the Tenth*

IEEE International Workshop on Quality of Service (IWQoS), Miami Beach, FL, May, 2002. 10 pages.
Acceptance Rate: 27/143 (18.9%)

61. Micah Adler and Dan Rubenstein, **Pricing Multicast in More Practical Network Models**, *Thirteenth Annual ACM-SIAM Symposium on Discrete Algorithms (ACM SODA'02)*, San Francisco, CA, January, 2002. 10 pages. This is also extended in a Transactions on Algorithms 2005 journal paper.
62. Panagiotis Sebos, Jennifer Yates, Dan Rubenstein, and Albert Greenberg, **Effectiveness of Shared Risk Link Group Auto-Discovery in Optical Networks**, *Optical Fiber Communication Conference (OFC 2002)*, Anaheim, CA, March, 2002. 3 pages.
63. Dan Rubenstein, Nicholas F. Maxemchuk and David Shur, **A Centralized, Tree-Based Approach to Network Repair Service for Multicast Streaming Media**, *Proc. IEEE NOSSDAV'00*, Chapel Hill, NC, June, 2000.
64. Dan Rubenstein, Jim Kurose, and Don Towsley, **Detecting Shared Congestion of Flows Via End-to-end Measurement**, *Proceedings of ACM SIGMETRICS'00*, Santa Clara, CA, June, 2000, **Best Student Paper Award Recipient.** 11 pages. This is also extended in a Transactions on Networking 2002 journal paper.
Acceptance Rate: 28/165 (17.0%)
65. Dan Rubenstein, Jim Kurose, and Don Towsley, **The Impact of Multicast Layering on Network Fairness**, *Proceedings of ACM SIGCOMM*, Cambridge, MA, September, 1999. 12 pages. This is also extended in a Transactions on Networking 2002 journal paper.
Acceptance Rate: 24/190 (12.6%)
66. Dan Rubenstein, Sneha Kasera, Don Towsley, and Jim Kurose, **Improving Reliable Multicast Using Active Parity Encoding Services (APES)**, *Proceedings of IEEE Infocom*, New York, NY, April, 1999. 8 pages. This is also extended in a Journal of Computer Networks 2004 journal paper.
Acceptance Rate: 184/600 (30.7%)
67. Dan Rubenstein, Jim Kurose, and Don Towsley, **Real-Time Reliable Multicast Using Proactive Forward Error Correction**, *Proceedings of IEEE NOSSDAV'98*, Cambridge, UK, July, 1998.

Patents

- Dan Rubenstein, Jim Kurose, and Don Towsley, *Multicast with Proactive Forward Error Correction*. (US Patent no. 6,278,716 issued 8/21/01).
- Angelos Stavrou, Angelos Keromytis, Jason Nieh, Vishal Misra, Dan Rubenstein, *Methods, Media and Systems for Responding to a Denial of Service Attack*. (US Patent no. 8,549,646, issued 10/1/13).
- Abhinav Kamra, Vishal Misra, Jon Feldman, Dan Rubenstein, *Methods, Systems, and Media for Forming Linear Combinations of Data*. (US Patent no. 8,655,839, issued 2/18/14).
- Joshua Reich, Oren Laadan, Vishal Misra, Eliahu Brosh, Jason Nieh, Daniel Stuart Rubenstein, Alexander Sherman, *Methods, Systems, and Media for Stored Content Distribution and Access*. (US Patent no. 9,609,044, issued 3/28/2017 and 10,601,901 B2 issued 3/24/2020).

- Daniel Rubenstein, Vishal Misra, Hanhua Feng, Martin C. Martin, *Content Centric Networking*. (US Patent no. 9,667,735, issued 5/30/2017).
- Vijay Gopalakrishnan, Rittwik Jana, Seungjoon Lee, Kadangode K. Ramakrishnan, Kyung-Wook Hwang, Vishal Misra, Daniel Rubenstein, System and Method of Adaptive Bit-Rate Streaming, (US Patent no. 9,699,236, issued 7/4/2017).
- Prashanth Pappu, Gary Kumfert, Daniel Rubenstein, *Mobile-to-TV deeplinking*. (US Patent no. 9,720,887, issued 8/1/2017).
- Daniel Rubenstein, Gil Zussman, Javad Ghaderi, Robert Margolies, Tingjun Chen, Guy Grebla, *Systems and Methods for Throughput Enhancement Among Ultra-low Power Wireless Network Devices*, (US Patent no. 10,200,956 B2, issued 2/5/2019).
- Yudong Yang, Vishal Misra, Daniel Stuart Rubenstein, Yuming Jiang, *Systems, Methods, and Media for Scheduling Traffic of a Communication Session Between an Application on a WiFi Network and Another Device*, (US Patent no. 10687341 B2, issued 6/16/2020).
- Josh Reich, Oren Laadan, Vishal Misra, Eli Brosh, Jason Nieh, Dan Rubenstein, Alex Sherman, *Methods, systems, and media for stored content distribution and access*, (US Patent no. 10601901, issued 2020).
- Vishal Misra, Dan Rubenstein, *Systems, methods and media for providing multi-homing*, (US Patent no. 11,259,352).
- Yudong Yang, Vishal Misra, Daniel Rubenstein, Yuming Jiang, *Systems, Methods, and Media for Scheduling Traffic of a Communication Session Between an Application on a Wifi Network and Another Device*, (US Patent no. 11,297,634 issued 2022 and 10,687,341 issued 2020).

Provisional Patents / Applications

- Angelos D Keromytis, Vishal Misra, Daniel Rubenstein, *System and methods for protecting network sites from denial of service attacks*, WO 2003069828 / PCT/US2003/004535
- Samrat Ganguly, Vishnu Navda, Aniruddha Bohra, Daniel S. Rubenstein, Distributed Channel Management Based on Channel Hopping in Uncoordinated 802.11 Based WLAN, US20090080377 A1, US 11/860,104

Graduated PhD Students

- Daniel Villela PhD 2005, current employment: CEPEL, Rio, Brazil.
- Bong-Jun Ko, PhD 2006, current employment: IBM Research, NY.
- Hoon Chang, PhD 2007 (co-advised with Misra), current employment: Samsung Labs, Korea.
- Hanhua Feng, PhD 2007 (co-advised with Misra), current employment: IBM Research, NY.
- Abhinav Kamra, PhD 2007 (co-advised with Misra), current employment: Citigroup, NY.

- Raj Kumar, PhD 2008, current employment: Telcordia
- Patrick Lee, PhD 2008 (co-advised with Misra), current employment: Professor, Chinese University of Hong Kong.
- Tianbai Ma, PhD 2009 (co-advised with Misra), current employment: Assistant Professor in School of Computing, National University of Singapore.
- Eli Brosh, PhD 2010 (co-advised with Misra), current employment: Vidyo.
- Josh Reich, PhD 2011 (co-advised with Misra), current employment: AT&T Labs / UC Berkeley
- Kyung-Wook Hwang, PhD 2013 (co-advised with Misra), current employment: AT&T Labs
- Yudong Yang, PhD 2019 (co-advised with Misra), current employment: Google
- Kunal Mahajan, PhD 2020 (co-advised with Misra), current employment: Facebook
- Niloofar Bayat, PhD 2022, current employment: Google

Current PhD Students

- Kahlil Dozier (expected date of graduation: May 2025)
- Loqman Salamatian (expected date of graduation: May 2025)
- Saeyoung Rho (expeected date of graduation: May 2026)
- Hadleigh Schwartz (expected date of graduation: May 2027)

Funding

- NSF

COMPLETED:

  - CNS-0117738, **Columbia Hotspot Rescue Service**, with Coffman (EE), Jelenkovic (EE), Nieh (CS) and Schulzrinne (CS), $1,414,999, July 2001-June 2005.
  - CNS-0133829, PI, **CAREER: Flexible, Large-Scale Best-Effort Quality of Service in the Internet**, $499,999, July 2002-June 2007.
  - CNS-0325495, **ITR: Collaborative Research: Peer-to-Peer Networking Theory** with Yao (IEOR), Ross (Polytechnic), Suel (Polytechnic) and Adler (UMass Amherst), Columbia Portion: $982,290, September 2003-August 2008.
  - CNS-0411047, PI, **Distributed, Self-Stabilizing Tasking for Emerging Network Environments**, $299,936, September 2004-August 2007.
  - CNS-0435168, **NeTS-NOSS: Funneling Impulses in Sensor Networks**, with Maxemchuk (EE), Jelenkovic (EE), Misra (CS), $750,078, September 2004-August 2007.

- CNS-0615126, **SMA/PDOS Collaborative Research: Design, Analysis, and Control of Adaptive Sharing Mechanisms**, with Misra (CS), Coffman (EE), Jelenkovic (EE), Harchol-Balter (CMU), $486,000, September 2006-August 2009.
- CNS-0627590, **CT-ISG: Understanding Control Plane Security: The Method of Strong Detection**, with Misra (CS), $400,000, September 2006-August 2009.
- CNS-1017934, PI, **NeTS:Small: Toward All Videos on Demand**, with Misra (CS), Coffman (CS), $500,000, July 2010 - June 2013.
- CCF-0905371, PI, **NetSE: Medium: Active Networked Tags: Ultra-Low Power Networking for Object Locating and Tracking**, with Kymissis (EE), Kinget (EE), Wang (EE), Zussman (EE), $1,200,000, June 2010 - May 2013.
- CNS-1717867, PI, **NeTS:Small: A Theoretical Approach to MAC Design for Communication Between Low Cost, Ultra-Low Power Devices**, with Ghaderi (EE), $499.981, August 2017 - July 2020.
- GCR, PI, **GCR: Emotionally Responsive Computation and Communication (ORION)**, with Sajda (BioMed), Ochsner (Psych), Jennings (CUNY) $800,000, January 2020 - December 2021.

- CNS, PI, **CNS Core: Small: Economic Optimization of Serverless and VM Cloud Services**, with Misra, $450,000 July 2019 - June 2022 (NCE to June 2023).

CURRENT:

- co-PI, **III: Medium: Unified Prefetch Framework for Approximation Tolerant Interactive Applications**, $1,199,021, with Wu (PI), July 2020- June 2024.
- PI, **RINGS: Deployable End-to-End Resilience for Critical Internet Applications via Modular Redundancy**, $1,000,000, with Schulzrinne, Katz-Bassett, May 2022 - April 2025.

• DARPA

COMPLETED:

- **Secure Overlay Services**, DARPA FTN program, $695,000, with Keromytis (CS) and Misra (CS), June 2002 - May 2004.
- **Zero Outage Dynamic Intrinsically Assurable Communities (ZODIAC)**, DARPA/STO, $835,357, with Bellovin (CS), Keromytis (CS), Maxemchuk (EE), Misra (CS), Schulzrinne (CS), November 2007 - May 2009.
- **Democratizing DDoS Defenses using Secure Indirection Networks**, DARPA, $989,478 (Columbia Portion), with Misra (CS), April 2016 - March 2019.
- **Machine-Intelligence for Advance Notification of Threats and Energy- Grid Survivable Situational Awareness (MANTESSA)**, DARPA, $1,066,278 (Columbia Portion), with Misra (CS), Zussman (EE), Bienstock (IEOR) July 2016 - June 2020.

• DHS

COMPLETED:

  - **Privacy Preserving Sharing of Network Trace Data**, HSARPA-DHS, $500,000 with Robert Gray (BAE), Steve Bellovin, Tony Jebara, Tal Malkin, Vishal Misra, Sal Stolfo, September 2009 - August 2010.
  - **Wi-Warn, An Intelligent, Wireless, Structural Sensing Solution for Urban Search & Rescue**, DHS HSHQDC-10-J-00204, $90,000 with Zussman (EE), January 2011 - December 2011.

- NIST:

CURRENT:

  - **Experimentally-driven mapping of QoS-to-QoE for Mission-Critical Voice**, $2,646,587, with Schulzrinne, February 2019 - January 2022 (NCE to January 2024)

- Air Force

COMPLETED:

  - **STTR Phase I: Robust Deployable Communications Networks**, $46,998, PI, with Project Owl (company), March 2020 - February 2021 .
  - **STTR Phase II: Robust Deployable Communications Networks**, $600,000, PI, with Project Owl (company), March 2020 - February 2021 .

- CATT/NYU: matching funds for Air Force funding: $51,105, May 2021 - April 2022.

- Company Gifts

COMPLETED:

  - Microsoft, **SwipeRight: Computational Support for Disaster Recovery Services**, $20,000 in Azure credits in February 2018.
  - Vodafone, **Active Networked Tags for Disaster Recovery Applications**, winner of Vodafone's "Wireless Innovation Project" competition, with Kinget (EE), Kymissis (EE), Wang (EE) and Zussman (EE), $300,000 in April 2009.
  - Google, **Self-Powered, Networked Tags for Active Tracking of Physical Objects**, with Kinget (EE), Kymissis (EE), Zussman (EE), $60,000 in November 2008.
  - Cisco, **Secure Overlay Services**, with Keromytis (CS) and Misra (CS), $70,000 in July 2002 and $76,000 in July 2003.
  - Cisco, **Asynchronous, Distributed, Self-Stabilizing Algorithms for Replica Placement**, $70,000 in July 2004.
  - Intel, **Secure Overlay Services** with Keromytis (CS), Misra (CS), $120,000 in August 2003, $90,000 in June 2004, $75,000 and 25 Thinkpad T20 laptops in August 2005.
  - IBM Faculty Award, $40,000 in July 2004.
  - Lucent, $10,000 in February 2003.
  - Microsoft (CS), $20,000 and ten mesh boxes, July 2005.

PhD Committee Service (graduated PhDs)

Jonathan Rosenberg (Advisor: Schulzrinne), 2001; Xin Wang (Advisor: Schulzrinne), 2001; Sushil da Silva (CS, Advisor: Yemini), 2002; Hari Sundaram (Advisor: Chang), 2002; Ping Pan (Advisor: Schulzrinne), 2002; Wenyu Jiang (CS, Advisor: Schulzrinne), 2003; Lisa Amini (CS, Advisor: Schulzrinne), 2003; Alex Konstantinou (CS, Advisor: Yemini), 2003; Jonathan Lennox (CS, Advisor: Schulzrinne), 2003; Michael Kounavis (Advisor: Campbell), 2004; Sadaki Maeda (Advisor: Diament), 2004; Yong Wang (Advisor: Chang), 2005; Xiaowei Zhang (Advisor: Maxemchuk), 2006; Weibin Zhao (CS, Advisor: Schulzrinne), 2006; Santosh Krishnan (CS, Advisor: Schulzrinne), 2006; Rita Wouhabi (Advisor: Campbell), 2006; Kundan Singh (CS, Advisor: Schulzrinne), 2006; Sangho Shin (CS, Advisor: Schulzrinne), 2006; Xiaotao Wu (CS, Advisor: Schulzrinne), 2007; Janak Parekh (CS, Advisor: Stolfo), 2007; Congzhou Zhou (Advisor: Maxemchuk), 2007; Jing Feng (Advisor: Coffman), 2007; Alberto Lopez Toledo (Advisor: Wang), 2007; Andreas Constantinides (Advisor: Coffman), 2007; Mike Locasto (CS, Advisor: Keromytis), 2007; Sangho Shin (CS, Advisor: Schulzrinne), 2008; Patrick Cheung, (EE, Advisor: Maxemchuk), 2008; Kyung Joon Kwak (EE, Advisor: Coffman), 2008; Stelios Sidiroglou, (CS, Advisor: Keromytis), 2008; Wei-Jen Li, (CS, Advisor: Stolfo), 2008; Vanessa Frias-Martinez (CS, Advisor: Stolfo), 2008; Ahutosh Dutta (EE, Advisor: Schulzrinne), 2010; Theodore Wilke (EE, Advisor: Maxemchuk), 2010; Congzhou Zhou (EE, Advisor: Maxemchuk), 2010; Shuzo Tarumi (EE, Advisor: Zussman), 2010; Ashutosh Dutta (CS, Advisor: Schulzrinne), 2010; Salman Baset (CS, Advisor: Schulzrinne), 2010; Patcharinee Tientrakool (EE, Advisor: Maxemchuk), 2011; Arezu Moghadam (CS, Advisor: Schulzrinne), 2011; Se Gi Hong (CS, Advisor: Schulzrinne), 2011; John Vicente (EE, Advisor: Campbell, 2011); Hang Zhao (CS, Advisor: Bellovin), 2012.

Invited Talks

- Detecting Shared Congestion of Flows via End-to-end Measurement
  - IBM Research, Hawthorne, NY, March 1, 2001.
  - Bell Labs Research, Holmdel, NJ, April 12, 2001.
- Pricing Multicast in More Practical Network Paradigms, Computer Communications Workshop, Charlottesville, VA, October 16, 2001.
- Using Overlays to Increase Network Robustness
  - University of Massachusetts, Amherst, MA, May 8, 2002.
  - Microsoft Research, Redmond, WA, July 22, 2002.
  - University of Washington, Seattle, WA, July 25, 2002.
  - IBM Research, Hawthorne, NY, Nov 4, 2002.
  - Eurecom, Sophia Antipolis, France, Nov 8, 2002.
  - RPI, Troy, NY, Nov 18, 2002.
  - Purdue University, Lafayette, IN, Nov 25, 2002.
  - IIT Bombay, Mumbai, India, Dec 12, 2002.
- Distributed Replicated Tasking in Emerging Network Environments

  - UC Berkeley, April 7, 2004
  - Stanford University, April 8, 2004

- Global Robustness and Correctness in Massively Distributed Network Systems

  - Polytechnic University, Brooklyn, NY, Oct 15, 2004
  - University of Pennsylvania, Philadelphia, PA, Nov 1, 2004.
  - NEC Research, Princeton, NJ, Jan 25, 2005.
  - Rutgers University, Piscataway, NJ, Jan 31, 2005.
  - University of Maryland, College Park, MD, March 4, 2005
  - Paris LIP6, Paris, France, June 26, 2006.
  - Microsoft Research, Redmond, WA, July 18, 2006

- 802.11 Spread Spectrum: Jam-Resilience via Channel Hopping, IEEE Computer Communications Workshop, Pittsburgh, PA, Feb 5, 2007.

- Increasing the Resilience of Routing in Untrusted and Collapsing Networks

  - Federal University of Rio de Janeiro (UFRJ), June 29, 2007.
  - Summer Research Institute, EPFL, Lausanne, Switzerland, July 17, 2007.
  - University of Texas Austin, October 25, 2007.
  - University of Maryland, December 6, 2007.
  - MITACS/MASCOS summer workshop, Montreal, Canada, June 18, 2008.
  - Google Research, New York, June 26, 2008.

- VMTorrent: Quick and Scalable Cloud-based VM Deployments

  - McGill University, September 23, 2011

- Using Energy Constrained Tag-to-tag networks for Tracking

  - Dartmouth University, June 17, 2016
  - Upsala University, August 29, 2016

- Keynote Address: Resilient Networking - A Performance Perspective, SBC 2007: XXVII Congresso da Sociedade Braileira de Computacao, Rio de Janeiro, Brazil, July 3, 2007

- Network Resilience: Using One's Neighbors Wisely in Cooperative Networks, IEEE ICCCN 2007, Distinguished Invited Talk, Honolulu, HI, August 15, 2007.

- Keynote Lecture: Energy-harvesting Active Networked Tags (EnHANTs), 12th Annual IFIP International Conference on Network and Parallel Computing, Sep 17, 2015.

- Keynote Lecture: Addressing the Communications Needs of First Responders in Large-Scale Emergencies, the 9th IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference, New York, NY, Nov 9, 2018.

Tutorials at Workshops and Conferences

- **Overlay and P2P Systems: Protocols, Applications, and Analysis**, full-day, co-presented with Samrat Bhattacharjee, the 4th International Workshop on Networked Group Communication (NGC), October 2002.
- **Peer-to-Peer Systems**, half-day co-presented with Keith Ross, IEEE Annual Conference, March 2003
- **Peer-to-Peer Systems**, half-day co-presented with Keith Ross, IEEE Annual Conference, March 2004
- **P2P Systems**, half-day, the annual ACM Sigmetrics Conference, June 2003.

Teaching

Scores shown as [Overall for instructor, Overall for course]

- F'00: ELEN 6761: Computer Communication Networks (78 students)
- S'01: ELEN 6762: Broadband Networks (48 students)
- F'01: ELEN 3910: Elements of Digital Systems (35 students)
- S'02: ELEN 4710: Intro to Network Engineering (43 students)
- F'02: ELEN 3910: Elements of Digital Systems (32 students), ELEN 3082: Digital Systems Lab (67 students)
- S'03: ELEN 4710: Intro to Network Engineering (32 students)
- F'03: ELEN 4710: Intro to Network Engineering (32 students)
- S'04: ELEN 3910: Elements of Digital Systems (33 students), ELEN 3082: Digital Systems Lab (51 students)
- F'04: ELEN 4710: Intro to Network Engineering (43 students)
- S'05: ELEN 6768: Topics in Telecommunications, Emerging Networks (19 students)
- S'06: COMS 4119: Computer Networks (32 students)
- F'06: ELEN 6772: Topics in Telecommunications, Resilient Networks (10 students)
- S'07: CSEE 4119: Computer Networks (29 students) [3.9, 3.8 out of 5.0]
- F'07: CSEE 3827: Fundamentals of Computer Systems (22 students) [3.71, 3.79 out of 5.0]
- S'08: ELEN 6768: Topics in Telelcommunications, Network Security (17 students)
- F'08: CSEE 3827: Fundamentals of Computer Systems (28 students) [2.84, 2.47 out of 5.0]
- S'09: CSEE 4119: Computer Networks (21 students) [4.14, 4.05 out of 5.0]
- F'09: CSEE 3827: Fundamentals of Computer Systems (40 students) [4.07, 4.07 out of 5.0]

- S'10: CSEE 4119: Computer Networks (28 students) [4.22, 4.17 out of 5.0]
- F'10: CSEE 3827: Fundamentals of Computer Systems (57 students) [3.97, 3.91 out of 5.0]
- S'13: CSEE 3827: Fundamentals of Computer Systems (129 students) [3.75, 3.68 out of 5.0]
- F'13: COMS 4995-4: Web, App and Mobile Programming (9 students) [Too few respondents]
- S'14: CSEE 3827: Fundamentals of Computer Systems (136 students) [3.65, 3.63 out of 5.0]
- S'15: CSEE 3827: Fundamentals of Computer Systems (143 students) [3.05, 3.17 out of 5.0]
- F'15: COMS 6998-12: Topics in Networked Tags (7 students) [Too few respondents]
- F'16 CSEE 4119: Computer Networks (126 students) [4.00, 3.98 out of 5.0]
- S'17: CSEE 3827: Fundamentals in Computer Systems (104 students) [3.69, 3.6 out of 5.0]
- F'17: CSEE 6998-15: Video Over the Internet (12 students) [4.9, 4.9 out of 5.0]
- S'18: CSEE 3827: Fundamentals of Computer Systems (213 students) [3.61, 3.55 out of 5.0]
- F'18: CSEE 3827: Fundamentals of Computer Systems (186 students) [3.40, 3.39 out of 5.0]
- S'19: CSEE 3827: Fundamentals of Computer Systems, 2 sections, (238 students)[3.79, 3.76 out of 5.0]
- S'21: CSEE 3827: Fundamentals of Computer Systems, 2 sections, (197 students)[3.95, 3.80 out of 5.0]
- Fall'21: COMS 3201: Discrete Mathematics, (53 students) (3.18, 3.14 out of 5.0)
- S'22: CSEE 3827: Fundamentals of Computer Systems, 3 sections, (296 students)[3.95, 3.78 out of 5.0]
- summer'22 COMS 3201: Discrete Mathematics, (47 students) [3.53, 3.47 out of 5.0]
- S'23: CSEE 3827: Fundamentals of Computer Systems, 3 sections, (279 students)(midterm: 3.96)

Departmental Service (CS)

- Faculty Recruiting Committee, F'08, '09, S'10, S'13
- MS Advising, F'08, '09, S'10, S'13, S'18
- PhD Admissions, F'08, '09, S'10, S'13
- Course Scheduling, F'09, S'10, F'10, S'13, F'13, S'14, S'15, F'15, S'16, F'16, S'17, F'17,
- TA Assignment, S'13, F'13, F'18, S'19, S'19, F'19, S'21, F'21, S'22, F'22
- MS Masters advising (Networks Track), F'16
- Undergrad advising, F'14, F'15

Departmental Service (EE)

- Curriculum Committee, F'01, S'02 (Chair), F'02, S'03: In S'02, F'02, S'03, participated in redesign of curriculum into current multi-track system format.
- Computing Committee F'03 (Chair), S'04 (Chair), F'04 (Chair), S'05 (Chair), F'05 (Chair), S'06 (Chair): led in the hiring of Departmental System Administrators.
- Faculty Recruiting Committee F'05, S'06, F'06, S'07.
- EE Website Development: F'06, S'07
- Created course ELEN 4710: Intro to Network Engineering, Fall 2001.