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EDUCATION

University of Massachusetts Amherst — Amherst, MA
Ph.D. in Electrical Engineering — May 2000
Advisor: Wei-Bo Gong

University of Massachusetts Amherst — Amherst, MA
M.S. in Electrical Engineering — May, 1996
Advisor: Lewis E. Franks

Indian Institute of Technology — Mumbai, India
Bachelor of Technology in Electrical Engineering — 1992

EXPERIENCE

Columbia University — New York, NY
Professor, Dept. of Computer Science — Spring 2016 - Present
Vice Chair, Dept. of Computer Science — July 2009 - June 2012
Associate Professor, Dept. of Computer Science — Spring 2006 - Fall 2015
Assistant Professor, Dept. of Computer Science — Fall 2001 - Fall 2005

Google — New York, NY
Visiting Scientist — July 2017 - Present

Infinio Inc. — Cambridge, MA
Founder and CEO — June 2011 - October 2012
Founder and CTO — October 2012 - June 2014
Founder and Chief Scientist — June 2014 - March 2017

University of Massachusetts — Amherst, MA
Post-Doctoral Research Associate, Computer Networks Research Group — 2000-Fall 2001
Research Assistant, Complex Systems Modeling and Control Lab — 1996-2000

Verizon (formerly Nynex Science & Technology) — White Plains , NY
Student Intern — Summer 1994, 1995

CricInfo (`http://espncricinfo.com`) — London, UK
Founding CTO — 1993-1998

Indian Institute of Technology — Mumbai, India
Research Associate — 1992-93

AWARDS

- Elected ACM Fellow, 2018
- Elected IEEE Fellow, 2016
- Elected Chair, ACM Sigmetrics, 2015-2017
- Outstanding Young Alumni Award, UMass-Amherst College of Engineering, 2014
- Elected Vice Chair, ACM Sigmetrics, 2011-2015
- Elected to the Board of Directors, ACM Sigmetrics, 2007-2011
- Elected Member, IFIP Working Group 7.3 on Computer Performance Modeling and Analysis, 2005.
- NSF Career Award, 2003
- Google Faculty Award, 2009, 2017
- IBM Faculty Award, 2007, 2002
- DoE Early Career Principal Investigator Award in Applied Mathematics, Computer Science and High Performance Networks, 2002

PUBLICATIONS

Journal Publications

1. Kyung-Wook Hwang, Vijay Bopalakrishnan, Rietwik Jana, Seungjoon Lee, Vishal 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. *sc
2. Vishal Misra, **Routing Money, Not Packets. Revisiting Network Neutrality**, *Communications of the ACM*, Volume 58, Number 6, June, 2015.
3. Richard T. B. Ma, John C. S. Lui and Vishal Misra , **Evolution of the Internet Economic Ecosystem**, *IEEE/ACM Transactions on Networking*, 2014.
4. Richard T. B. Ma and Vishal Misra, **The Public Option: a Non-regulatory Alternative to Network Neutrality**, *IEEE/ACM Transactions on Networking*, 2013.
5. Richard T. B. Ma and Vishal Misra, **Congestion and Its Role in Network Equilibrium**, *IEEE Journal on Selected Areas in Communications*, Volume 30, Number 11, December, 2012.
6. Joshua Reich, Dan Rubenstein, Vishal Misra and Gil Zussman, **Connectivity Maintenance in Mobile Wireless Networks via Constrained Mobility**, *JSAC Special Issue Communications Challenges and Dynamics for Unmanned Autonomous Vehicles* , Volume 30, Number 5, pp. 935-950, 2012.
7. 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.
8. 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.
9. 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.

10. 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.
11. P. Bahl, R. Chandra, P.P.C. Lee, Vishal 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.
12. Richard T.B. Ma, Vishal Misra and Dan Rubenstein, **An Analysis of Generalized Slotted-Aloha Protocols**, *IEEE/ACM Transactions on Networking*, Volume 17, Number 3, 2009.
13. 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, pp. 1490-1501, Dec, 2007.
14. Samuli Aalto, Urtzi Ayesta, Sem Borst, Vishal Misra and Rudesindo Nunez-Queija, **Beyond Processor Sharing**, *ACM/Sigmetrics Performance Evaluation Review, Special issue on "New Perspectives on Scheduling"*, March, 2007.
15. 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.
16. Wei-Bo Gong, Yong Liu, Vishal Misra and Don Towsley, **Self-Similarity and Long Range Dependence on the Internet: A Second Look at the Evidence, Origins and Implications**, *Computer Networks*, Volume 48, pp. 377-399, June, 2005.
17. Daniel R. Figueiredo, Benyuan Liu, Anja Feldmann, Vishal Misra, Don Towsley and Walter Willinger, **On TCP and self-similar traffic**, *Performance Evaluation*, Volume 61, pp. 129-141, July, 2005.
18. Yossi Chait, C.V. Hollot, Vishal Misra, Don Towsley, H. Zhang and Y. Cui, **Throughput Differentiation Using Coloring at the Network Edge and Preferential Marking at the Core**, *IEEE/ACM Transactions on Networking*, Volume 13, Number 4, August, 2005.
19. Yong Liu, Francesco LoPresti, Vishal Misra, Don Towsley and Yu Gu, **Scalable fluid models and simulations for large-scale IP networks**, *ACM Transactions on Modeling and Computer Simulation (TOMACS).*, July, 2004.
20. 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.
21. D. R. Figueiredo, B. Liu, Vishal Misra and Don Towsley, **On the Autocorrelation Structure of TCP Traffic**, *Journal of Computer Networks, Special Issue on Advances in Modeling and Engineering of Long-Range Dependent Traffic*, 2002.
22. C.V. Hollot, Vishal Misra, Don Towsley and Wei-Bo Gong, **Analysis and design of controllers for AQM routers supporting TCP flows**, *IEEE Transactions on Automatic Control*, 2002.
23. J. Arias, A.K. Chhabra, and Vishal Misra, **A Practical Application of Graphics Recognition: Helping with the Extraction of Information from Telephone Company Drawings**, *Lecture Notes in Computer Science*, Volume 1389, 1998.
24. A.K. Chhabra, Vishal Misra and J. Arias, **Detection of horizontal lines in noisy run length encoded images: The FAST method**, *Lecture Notes in Computer Science*, Volume 1072, 1996.

Refereed Conference Publications

1. Yudong Yang, Vishal Misra and Dan Rubenstein, **A Modeling Approach to Classifying Malicious Cloud Users via Shuffling**, *MAMA 2018 Workshop*, Irvine, CA, June, 2018.
2. Vishal Misra **On Differential Pricing and Net Neutrality**, *55th Annual Allerton Conference on Communication, Control, and Computing*, October, 2017
3. Yibo Zhu, Monia Ghobadi, Vishal Misra and Jitendra Padhye, **ECN or Delay: Lessons Learnt from Analysis of DCQCN and TIMELY**, *Proceedings of 2016 ACM Conference on Emerging network experiment and technology (CoNEXT 2016)*, December, 2016.
4. Yudong Yang, Vishal Misra and Dan Rubenstein, **On the Optimality of Greedy Garbage Collection for SSDs**, *MAMA 2015 Workshop*, Portland, OR, June, 2015.
5. Zeinab Abbassi, Aditya Bhaskara and Vishal Misra, **Optimizing Display Advertising in Online Social Networks**, *24th International World Wide Web Conference (WWW 2015)*, Florence, Italy, 2015.
6. Kyung-Wook Hwang, Vijay Gopalakrishnan, Rittwik Jana, Seungjoon Lee, Vishal Misra, K. K. Ramakrishnan and Dan Rubenstein, **Joint-Family: Enabling Adaptive Bitrate Streaming in Peer-to-Peer Video-on-Demand**, *IEEE ICNP 2013*, Gttingen, Germany, October, 2013.
7. Kyung-Wook Hwang, Vijay Gopalakrishnan, Rittwik Jana, Seungjoon Lee, Vishal Misra and K. K. Ramakrishnan, **Abandonment and its Impact on P2P VoD Streaming**, *IEEE P2P 2013*, Trento, Italy, IEEE, September, 2013.
8. Richard T. B. Ma, John C. S. Lui and Vishal Misra, **On the Evolution of the Internet Economic Ecosystem**, *Proceedings of the 22nd International World Wide Web Conference (WWW 2013)*, Rio de Janeiro, Brazil, May, 2013.
9. Richard T. B. Ma, John C. S. Lui and Vishal Misra, **A Preference Model for Deciding the Market Share of Network Service Providers**, *Workshop on Telecom Economics, Engineering and Policy*, Krakow, Poland, September, 2012.
10. 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 2012)*, Nice, France, December, 2012.
11. 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.
12. Kyung-Wook Hwang, David Applegate, Aaron Archer, Vijay Gopalakrishnan, Seungjoon Lee, Vishal Misra, K. K. Ramakrishnan, and Deborah Swayne, **Leveraging Video Viewing Patterns for Optimal Content Placement**, *Networking*, Prague, Czech, May, 2012.
13. Richard T.B. Ma and Vishal Misra, **Congestion Equilibrium for Differentiated Service Classes**, *Allerton Conference on Communication, Control and Computing*, 2011, 2011.
14. Zeinab Abbassi and Vishal Misra, **Multi-level Revenue Sharing for Viral Marketing**, *Proceedings of ACM NetEcon 2011*, June, 2011.
15. Richard T.B. Ma and Vishal Misra, **The Public Option: A non-regulatory alternative to Network Neutrality**, *Proceedings of 2011 ACM Conference on Emerging network experiment and technology (CoNEXT 2011)*, Tokyo, Japan, December, 2011.
16. Zeinab Abbassi and Vishal Misra, **Multi-level Revenue Sharing for Viral Marketing**, *Proceedings of ACM NetEcon 2011*, June, 2011.
17. Joshua 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.

18. Panayotis Antoniadis, Serge Fdida, Timur Friedman and Vishal Misra, **Federation of virtualized infrastructures: sharing the value of diversity**, *Proceedings of 2010 ACM Conference on Emerging network experiment and technology (CoNEXT 2010)*, Philadelphia, PA, USA, 2010.
19. 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.
20. Salman A. Baset, Joshua Reich, Jan Janak, Pavel Kasparek, Vishal Misra, Dan Rubenstein and Henning Schulzrinne, **How Green is IP-Telephony?**, *Proceedings of SIGCOMM Green Networking Workshop*, August, 2010.
21. Zeinab Abbassi and Vishal Misra, **Incentivized Advertising over Social Networks**, *Allerton Conference on Communication, Control and Computing*, September, 2010.
22. Zeinab Abbassi and Vishal Misra, **Sharing the Revenue of Online Ads over Social Networks**, *Second Workshop on Information in Networks*, NYU Stern, September, 2010.
23. Vishal Misra, Stratis Ioannidis, Augustin Chaintreau and Laurent Massoulie, **Incentivizing Peer-Assisted Services: A Fluid Shapley Value Approach**, *Proceedings of ACM/Sigmetrics*, New York, June, 2010.
24. Jean-Claude Bermond, Dorian Mazauric, Vishal Misra and Philippe Nain, **A Distributed Scheduling Algorithm for Wireless Networks with Constant Overhead and Arbitrary Binary Interference (short paper)**, *Proceedings of ACM/Sigmetrics*, New York, June, 2010.
25. 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.
26. Alix L.H. Chow, Leana Golubchik and Vishal Misra, **BitTorrent: An Extensible Heterogeneous Model**, *Annual Joint Conference of the IEEE Computer and Communications Societies (IEEE Infocom)*, Rio de Janeiro, April, 2009.
27. Richard T.B. Ma, Dahming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **The Shapley Value: Its Use and Implications on Internet Economics**, *Allerton Conference on Communication, Control and Computing*, September, 2008.
28. 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 2008)*, Madrid, Spain, December, 2008.
29. 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 2008)*, Madrid, Spain, December, 2008, Best Paper Award Recipient.
30. 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.
31. Alix L.H. Chow, Leana Golubchik and Vishal Misra, **Improving BitTorrent: A Simple Approach**, *Proceedings of IPTPS*, 2008.
32. Joshua Reich, Vishal Misra and Dan Rubenstein, **Roomba MADNeT: a Mobile Ad-hoc Delay Tolerant Network Testbed**, *MC2R: Mobile Computing and Communications Review*, ACM Sigmobile, 2008.
33. Joshua Reich, Vishal Misra and Dan Rubenstein, **The Time Correlated Update Problem**, *Performance Evaluation Review*, ACM Sigmetrics, Smirni, Evgenia, ACM Special Interest Group on Measurement and Evaluation, Volume 35, Number 2, pp. 33-35, September, 2007.

34. Joshua Reich, Vishal Misra and Dan Rubenstein, **The Time Correlated Update Problem**, *MAMA*, ACM, San Diego, CA, June, 2007.
35. Joshua Reich, Vishal Misra and Dan Rubenstein, **MADNeT Testbed**, *Joint Mobicom / Mobihoc Student Demo Competition*, ACM, Montreal, QC, September, 2007, Best Student Demo Award Recipient.
36. Richard T.B. Ma, Dahming Chiu, John C.S. Lui, Vishal Misra and Dan Rubenstein, **Internet Economics: The use of Shapley value for ISP settlement**, *Proceedings of 2007 ACM Conference on Emerging network experiment and technology (CoNEXT 2007)*, Columbia University, New York, December, 2007.
37. 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.
38. 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.
39. Hanhua Feng, Vishal Misra and Dan Rubenstein, **PBS: A Unified Priority-Based Scheduler**, *Proceedings of ACM Sigmetrics*, San Diego, CA, June, 2007.
40. 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.
41. 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.
42. Patrick P. C. Lee, Vishal Misra and Dan Rubenstein, **Toward Optimal Network Fault Correction via End-to-End Inference**, *Proceedings of IEEE INFOCOM*, Anchorage, Alaska, May, 2007.
43. Eli Brosh, Salman A. Baset, Vishal Misra, Dan Rubenstein, and Henning Schulzrinne, **Understanding the Behavior of TCP for Real-time CBR workloads**, *Proceedings of 2nd CoNEXT Conference (short paper)*, Lisboa, Portugal, December, 2006.
44. Raj Kumar Rajendran, Vishal Misra and Dan Rubenstein, **Control Plane Resilience: The Method of Strong Detection**, Allerton 2006, September, 2006.
45. 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.
46. Abhinav Kamra, Jon Feldman, Vishal Misra and Dan Rubenstein, **Growth Codes: Maximizing Sensor Network Data Persistence**, *Proceedings of ACM Sigcomm*, Pisa, Italy, September, 2006.
47. Daniel Villela, Vishal Misra, Dan Rubenstein and Sambit Sahu, **Impact of Load Sharing on Provisioning Services**, *Annual Joint Conference of the IEEE Computer and Communications Societies (IEEE Infocom)*, Barcelona, Spain, April, 2006.
48. Hoon Chang, Vishal Misra and Dan Rubenstein, **A General Model and Analysis of Physical Layer Capture in 802.11 Networks**, *Annual Joint Conference of the IEEE Computer and Communications Societies (IEEE Infocom)*, Barcelona, Spain, April, 2006.
49. Richard T.B. Ma, Vishal Misra and Dan Rubenstein, **Modeling and Analysis of Generalized Slotted-Aloha MAC Protocols in Cooperative, Competetive and Adversarial Environments**, *The 26th International Conference on Distributed Computing Systems (ICDCS 06)*, Lisboa, Portugal, July, 2006.

50. 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.
51. Abhinav Kamra, Jon Feldman, Vishal Misra and Dan Rubenstein, **Encoding for Persistent Sensor Networks**, *Allerton Conference on Communication, Control and Computing*, September, 2005.
52. Raj Kumar Rajendran, Vishal Misra and Dan Rubenstein, **Brief Announcement: Strong Detection of Misconfigurations**, *Principles of Distributed Computing (PODC)*, Las Vegas, NV, July, 2005.
53. 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.
54. 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.
55. Abhinav Kamra, Hanhua Feng, Vishal Misra and Angelos Keromytis, **The Effect of DNS Delays on Worm Propagation in an IPv6 Internet**, *Proceedings of IEEE Infocom*, IEEE, Miami, FL, USA, 2005.
56. Patrick P. C. Lee, Vishal Misra and Dan Rubenstein, **Distributed Algorithms for Secure Multipath Routing**, *Proceedings of IEEE Infocom*, Miami, FL, March, 2005.
57. Hoon Chang and Vishal Misra, **802.11 Link Interference: A Simple Model and A Performance Enhancement**, *International IFIP-TC6 Networking Conference (NETWORKING)*, Waterloo, Canada, pp. 1330 - 1333, May, 2005.
58. 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.
59. Laura Wynter, Don Towsley, Zhen Liu and Vishal Misra, **Dynamic offloading in a multi-provider environment: a behavioral framework and a polynomial-time dual algorithm for modeling and influencing peering**, *PRIXNET 2004 - Internet Pricing Workshop*, 2004.
60. H. Han, C.V. Hollot, Yossi Chait and Vishal Misra, **TCP Networks Stabilized by Buffer-Based AQMs**, *Proceedings of IEEE Infocom*, 2004.
61. Abhinav Kamra, Vishal Misra and Erich Nahum, **Yaksha: A Self-Tuning Controller for Managing the Performance of 3-Tiered Web Sites**, *International Workshop on Quality of Service (IWQoS)*, June, 2004.
62. Abhinav Kamra, Vishal Misra and Erich Nahum, **Controlling the Performance of 3-Tiered Web sites: Modeling, Design and Implementation**, *ACM Sigmetrics*, June, 2004.
63. 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.
64. 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.
65. Hanhua Feng and Vishal Misra, **On the relationship between coefficient of variation and the performance of M/G/1-FB queues**, *MAMA*, ACM, 2004.
66. M. Vojnovic, J.-Y. Le Boudec, Don Towsley and Vishal Misra, **A Note on the Stochastic Bias of Some Increase-Decrease Congestion Controls: HighSpeed TCP Case Study**, *PFLDNet*, CERN, Geneva, 2003.

67. 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.
68. 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.
69. Honggang Zhang, C.V.Hollot, Don Towsley and Vishal Misra, **A Self-Tuning Structure for Adaptation in TCP/AQM Networks**, *ACM Sigmetrics (short paper)*, June, 2003.
70. Yong Liu, Francesco LoPresti, Vishal Misra and Don Towsley, **Fluid Models and Solutions for Large-Scale IP Networks**, *Proceedings of ACM Sigmetrics*, San Diego, CA, 2003.
71. Honggang Zhang, C. V. Hollot, Don Towsley and Vishal Misra, **A self-tuning structure for adaptation in TCP/AQM networks**, *Proceedings of IEEE Globecom*, Volume 22, Number 1, pp. 3641-3645, December, 2003.
72. Hanhua Feng and Vishal Misra, **Mixed Scheduling Disciplines for Network Flows**, *MAMA*, ACM, 2003.
73. C.V. Hollot, Yong Liu, Vishal Misra and Don Towsley, **Unresponsive Flows and AQM performance**, *Proceedings of IEEE Infocom*, April, 2003.
74. Abhinav Kamra, Vishal Misra and Don Towsley, **Achieving High Throughput in Low Multiplexed, High Bandwidth, High Delay Environments**, *First International Workshop on Protocols for Fast Long-Distance Networks*, February, 2003.
75. E.G. Coffman Jr., Z. Ge, Vishal Misra and Don Towsley, **Network Resilience: Exploring Cascading Failures within BGP**, *Allerton Conference on Communication, Control and Computing*, October, 2002.
76. Angelos Keromytis, Vishal Misra, and Dan Rubenstein, **Using Overlays to Improve Network Security**, *SPIE ITCom Conference on Scalability and Traffic Control in IP Networks II*, Boston, MA, July, 2002, Invited Paper.
77. Yossi Chait, C.V. Hollot, Vishal Misra, Don Towsley, Honggang Zhang and John Lui, **Providing Throughput Differentiation for TCP Flows Using Adaptive TwoColor Marking and Multi-Level AQM**, *Proceedings of IEEE Infocom*, 2002.
78. Yossi Chait, C.V. Hollot, Vishal Misra, Huaizhong Han and Yoram Halevi, **Dynamic Analysis of Congested TCP Networks**, *Proceedings of American Control Conference*, 2002.
79. Angelos Keromytis, Vishal Misra and Dan Rubenstein, **SOS: Secure Overlay Services**, *Proceedings of ACM Sigcomm*, Pittsburgh, PA, August, 2002.
80. C. V. Hollot, Vishal Misra, Don Towsley and Wei-Bo Gong, **On Designing Improved Controllers for AQM Routers Supporting TCP Flows**, *Proceedings of IEEE Infocom*, April, 2001.
81. C.V. Hollot, Vishal Misra, Don Towsley and Wei-Bo Gong, **A Control Theoretic Analysis of RED**, *Proceedings of IEEE Infocom*, April, 2001.
82. Yong Liu, Wei-Bo Gong, Vishal Misra and Don Towsley, **On the tails of Web filesize distributions**, *Allerton Conference on Communication, Control and Computing*, 2001.
83. Yossi Chait, Salomon Oldak, C.V. Hollot and Vishal Misra, **An Adaptive Control Strategy For AQM Routers Supporting TCP Flows**, *Proceedings of ASME International Mechanical Engineering Congress and Exposition*, 2001.
84. Yossi Chait, C.V. Hollot, Vishal Misra, Salomon Oldak, Don Towsley and Wei-Bo Gong, **Fixed and Adaptive Model-Based Controllers for Active Queue Management**, *Proceedings of American Control Conference*, 2001.

85. Vishal Misra, Wei-Bo Gong and Don Towsley, **Fluid-based Analysis of a Network of AQM Routers Supporting TCP Flows with an Application to RED**, *Proceedings of ACM Sigcomm*, Stockholm, Sweden, August, 2000.
86. Vishal Misra, Wei-Bo Gong and Don Towsley, **Stochastic Differential Equation Modeling and Analysis of TCP Windowsize Behavior**, *Proceedings of IFIP WG 7.3 Performance*, November, 1999.
87. Vishal Misra, A.K. Chhabra, and J. Arias, **A Memory Efficient Method for Fast Transposing Run-Length Encoded Images**, *Proceedings of the International Conference on Document Analysis and Recognition (ICDAR'99)*, 1999.
88. Vishal Misra and Wei-Bo Gong, **A Hierarchical Model for Teletraffic**, *Proceedings of the 37th Annual IEEE CDC*, Tampa, pp. 1674-1679, 1998.
89. J. Arias, A.K. Chhabra, and Vishal Misra, **Finding straight lines in drawings**, *Proceedings of the International Conference on Document Analysis and Recognition (ICDAR'97), Ulm, Germany*, August, 1997.
90. J. Arias, A.K. Chhabra, and Vishal Misra, **Interpreting and representing tabular documents**, *Proceedings of International Conference on Computer Vision and Pattern Recognition (CVPR)*, July, 1996.
91. J. Arias, A.K. Chhabra, and Vishal Misra, **Efficient interpretation of tabular documents**, *Proceedings of 13th International Conference on Pattern Recognition (ICPR)*, Volume III, pp. 681-685, August, 1996.
92. A.K. Chhabra, S. Surya, and Vishal Misra, **Detection of horizontal lines in telephone company drawings**, *Proceedings of the IAPR Workshop on Graphics Recognition (GREC'95)*, August, 1995.
93. A.K. Chhabra and Vishal Misra, **Experiments with Statistical Connectionist Methods and Hidden Markov Models for Recognition of Text in Telephone Company Drawings**, *Proceedings of the Second International Workshop on Applications of Neural Networks to Telecommunications (IWANNT'95)*, 1995.
94. Vishal Misra and P.G. Poonacha, **A New Approach to the Design of Cascade Form Powers of Two FIR Filters using Karmarkar's Algorithm**, *Proceedings of the Fifth Annual International DSP Workshop held in the Starved Rock Resort, Illinois*, 1992.

PATENTS

- US Patent Number: US05923782, "System for detecting and identifying substantially linear horizontal and vertical lines of engineering drawings", inventors A.K. Chhabra, Vishal Misra and S. Surya
  Filed Aug 1, 1996. Awarded Jul 13, 1999.
- US Patent Number: US7085236, "Active queue management for differentiated services", inventors Salomon Oldak, Wei-Bo Gong, Christopher V. Hollot, Don Towsley, Vishal Misra and Yossi Chait
  Filed May 20, 2002. Awarded Aug 1, 2006.
- US Patent Number: US8667588, "Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems", inventors Stolfo; Salvatore J., Keromytis; Angelos D., Misra; Vishal, Locasto; Michael E., Parekh; Janak
  Filed Nov 24, 2004. Awarded Mar 4, 2014.
- US Patent Number: US7779463, "Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems", inventors Stolfo; Salvatore J., Keromytis; Angelos D., Misra; Vishal, Locasto; Michael E., Parekh; Janak
  Filed Nov 24, 2004. Awarded Aug 17, 2010.
- US Patent Number: US7784097, "Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems", inventors Stolfo; Salvatore J.,

Keromytis; Angelos D., Misra; Vishal, Locasto; Michael E., Parekh; Janak
Filed Nov 24, 2004. Awarded Aug 24, 2010.

- US Patent Number: US8549646,"Methods, media and systems for responding to a denial of service attack", inventors Stavrou; Angelos, Keromytis; Angelos D., Nieh; Jason, Misra; Vishal, Rubenstein; Daniel
Filed Oct 1, 2005. Awarded Oct 1, 2013.
- US Patent Number US8655839 "Methods, systems, and media for forming linear combinations of data", inventors Abhinav Kamra, Vishal Misra, Jon Feldman, Daniel Rubenstein,
Filed Mar 5, 2007. Awarded Feb 18, 2014.
- U.S. Patent No. 9,609,044 "Methods, systems, and media for stored content distribution and access", inventors Reich; Joshua Oren Laadan, Vishal Misra, Eliahu Brosh, Jason Nieh, Daniel Stuart Rubenstein Alexander Sherman
Filed November 7, 2011. Awarded March 28, 2017

GRANTS

1. PI, **Bandwidth allocation strategies for multi data center networks** , Google Faculty Research Award, $ 75,000, 2017.
2. PI NSF: NeTS: **RDMA over Ethernet: A Control Theoretic Approach** ($499,882 over 3 years)
3. co-PI DARPA XD3: **Democratizing DDoS Defenses using Secure Indirection Networks**, with Dan Rubenstein ($ 989,478.00 over 4 years)
4. co-PI DARPA RADICS: **Machine-Intelligence for Advance Notification of Threats**, with Dan Bienstock, Dan Rubenstein and Gil Zussman ($ 1,066,278.00 over 4 years)
5. co-PI **Creating a Cyber Insurance Marketplace** $75,000, SEAS Interdisciplinary Research Program, with Garud Iyengar, part of joint project with Steve Bellovin, Henning Schulzrinne and Assaf Zeevi
6. PI $50,000 Lightspeed Venture Partners, unrestricted gift, part of joint project with Steve Bellovin, Henning Schulzrinne and Assaf Zeevi
7. PI **Data Transparency Lab**, €50,000 (unrestricted gift from Telefonica R&D)
8. co-PI, **Toward All Videos on Demand,**, NSF with Rubenstein (PI), Coffman, $500,000, September 2010 - August 2013.
9. PI, **Incentivizing Managed Peer to Peer Systems: A Fluid Shapley Value Approach**, Google Faculty Research Award, $ 65,000, 2009.
10. co-PI, **Privacy Preserving Sharing of Network Trace Data**, DHS, with Stolfo (PI), Jebara, Malkin and Rubenstein. $1.9 million, June 2009-May 2012.
11. PI, **SMA/PDOS Collaborative Research: Design, Analysis, and Control of Adaptive Sharing Mechanisms**, NSF, with Coffman (EE), Jelenkovic (EE), Rubenstein (EE), Harchol-Balter (CMU), $750,000, September 2006-August 2009.
12. PI, **CT-ISG: Understanding Control Plane Security: The Method of Strong Detection**, NSF, with Rubenstein (EE), $400,000, September 2006-August 2009.
13. PI, **Wireless Internet Center for Advanced Technology**, NSF I/UCRC Center, $250,000 with Schulzrinne, Maxemchuk (EE) and Rubenstein (EE), August 2004- May 2008.
14. co-PI **Zero Outage Dynamic Intrinsically Assurable Communities (ZODIAC)**, DARPA/STO, $835,357 with Bellovin (PI), Keromytis, Schulzrinne, Dan Rubenstein (EE), Maxemchuck (EE), November 2007 - May 2009
15. co-PI **Funneling Impulses in Sensor Networks**, NSF, $750,000, with Jelenkovic (EE), Maxemchuk (PI, EE) and Rubenstein (EE), August 2004- May 2007.

16. PI, **Expecting the Unexpected: A Study of Network Vulnerabilities** $425K, 8/1/2003-7/31/2008. NSF Career Award
17. co-PI Cisco, **Secure Overlay Services**, with Keromytis (PI) and Rubenstein (EE), $70,000 in July 2002 and $76,000 in July 2003.
18. co-PI Intel, **Secure Overlay Services** with Keromytis, Rubenstein (PI, EE), $120,000 in August 2003, $90,000 in June 2004, $75,000 and 25 Thinkpad T20 laptops in August 2005.
19. PI Microsoft with Rubenstein (also PI, EE), $20,000 and ten mesh boxes, July 2005.
20. co-PI **Secure Overlay Services**, AFRL/DARPA, with Keromytis (PI) and Rubenstein (EE), $615,000, June 2002-May 2004
21. co-PI **Scalable AQM routers supporting heterogeneous traffic**, NSF, with Hollot (PI, UMass) and Chait (UMass), $340,000, June 2002-May 2005
22. PI **A Study of Transport Protocols for Wide Area Scientific Applications**, DOE Career Award, $303,000, September 2002-May 2005
23. IBM Faculty Award, $40,000, 2002
24. IBM Faculty Award, $30,000, 2007
25. co-PI **Distributed Intrusion Detection Feasibility Study**, NSA, with Stolfo (PI), Malkin and Keromytis, $200,000, March 2003-March 2004.

INVITED TALKS

- Stanford University, September 2018
- Data Center Scheduling Summer School, TTIC, Chicago, July 2018
- Google PlaNet Seminar, Google, July 2018
- MIT, July 2018
- Data Center Networking Workshop, Wisconsin, Madison, July 2018
- Council for Foreign Research, New York, March 2018
- IIT Mumbai, December 2017
- Workshop on Internet Economics, CAIDA, San Diego, December 2017
- Keynote, ACM Mobihoc, Chennai, July 2017
- IEEE GNY section, NYC, March 2017
- Clean Sky Conference, NTNU, Trondheim, August 2016
- Microsoft Faculty Summit, Seattle, July 2016
- UIUC Department of ECE Colloquium, March 2016
- Stanford University, May 2015
- Stony Brook University, March 2015
- VMware, January 2015
- USC, January 2015
- Princeton, November 2014
- MIT, November 2014
- Telefonica Research, Barcelona, September 2013.
- Universidad Carlos III de Madrid, Madrid, February 2013.

- Federal Communications Commission, Washington DC, October 2012.
- Google Labs, New York, April 2011.
- University of Michigan and Wayne State NSF funded Center for Incentive Centered Design, November 2010.
- Cornell University, Ithaca, October 2010.
- Google Labs, New York, January 2010.
- USC Computer Science Department Colloquium, November 2009.
- Telefonica Labs, Barcelona. August 2009.
- Ecole Normale Superieure, Paris. June 2009.
- Paris Networking Workshop, Paris. June 2009.
- MAESTRO group seminar, INRIA Le Boreon. February 2009.
- Networking Seminar, Sophia Antipolis Networking Seminar Series, April 2009.
- MAESTRO seminar, Le Boreon. February 2009.
- NYU-Poly Computer Science seminar, Brooklyn, January 2009
- Networking Seminar, Sophia Antipolis Networking Seminar Series, April 2009.
- Alcatel-Lucent Bell Labs, Murray Hill NJ, April 2008
- Invited expert to formulate strategic long term research priorities of EU Networked Media Program (FP7): Brussels, March 2007
- IBM Watson Performance Modeling and Analysis Seminar Series, August 2006
- Microsoft Research, Cambridge, July 2006.
- Statslab, Dept. of Mathematics, Cambridge University, July 2006.
- Invited Paper, INFORMS conference, Pittsburgh November 2006.
- USC Computer Science Lecture Series, May 2006
- CMU, Computer Science Lecture Series, May 2005
- Keynote Speaker, Performance Track of SBC (Brazil's Annual Computer Science Conference), July 2005
- Korea Advanced Institute of Science and Technology (KAIST), Daejon, Korea, March 2004.
- Institute for Pure and Applied Mathematics (IPAM), Large-Scale Communication Networks: Topology, Routing, Traffic, and Control Workshop, UCLA, September 2003
- The Congestion Control and Heavy Traffic Modeling Workshop, Statistical and Applied Mathematical Sciences Institute (SAMSI), North Carolina, September 2003
- The COST(EU)-NSF(USA) Workshop on Exchanges & Trends in Networking, Crete, June 2003
- Lecture Series, IBM Research Labs, New Delhi, January 2003
- Hot Topic on Long Range Dependence, Performance 2002 Conference, Rome, October 2002
- Computer Science Colloquium, University of Pittsburgh, April 2002
- Lab Colloquium, HP Labs, Palo Alto, March 2002
- IPAM Communication Networks Workshop, LA, March 2002
- Invited Talk, Nortel Networks, Billerica, October 2001
- Invited Paper, Informs 2001, New York City, July 2001
- Caltech, October 2000

- Computer Science Lecture Series, UCLA, October 2000
- Computer Science Lecture Series, USC/ISI, October 2000
- Invited Talk, 15th annual IEEE Computer Communications Workshop, October 2000
- Invited Talk, TCP Workshop, ENS Paris, September 2000
- Invited Paper, Informs 2000, Boca Raton, March 2000
- Invited Paper, Performance 99, Istanbul, October 1999

PROFESSIONAL SERVICE

- Program Co-Chair NetEcon 2016
- Program Committee ACM/Sigcomm 2016
- Program Committee ACM/Sigmetrics 2016
- Program Co-Chair ICNP 2015
- Program Committee ACM/Sigmetrics 2015
- Program Committee 29th IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2015)
- Program Committee, ICNP 2014
- Program Co-Chair CoNeXT 2013
- Program Committee IEEE/Infocom 2013
- Program Committee ACM/Sigmetrics 2013
- Program Committee 28th IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2013)
- Program Committee, CoNeXT 2012
- Program Committee IEEE/Infocom 2012
- Program Committee, CoNeXT 2011
- Program Committee IEEE/Infocom 2011
- Program Committee 27th IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2011)
- Associate Editor, Elsevier Journal on Performance Evaluation, 2009-
- Associate Editor, IEEE/ACM Transactions on Networking, 2008-
- Program Committee IEEE/Infocom 2010
- General Chair ACM/Sigmetrics 2010
- Program Committee 26th IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2010)
- Program Committee IEEE/Infocom 2009
- Program Committee ACM/Sigmetrics 2009
- Program Committee NetEcon 2009
- Program Committee, CoNeXT 2008
- TPC Co-Chair, ACM/Sigmetrics 2008
- Area Chair, IEEE/Infocom 2008
- Program Committee 25th IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2007)

- Program Committee ACM/Sigmetrics 2007
- Program Committee IEEE/Infocom 2007
- Program Committee ACM/Sigcomm 2006
- Program Committee ACM/Sigmetrics 2006
- Program Committee IEEE/Infocom 2006
- Student Workshop co-chair, IEEE/Infocom 2006
- Program Committee 24th IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2005)
- Guest-editor of Special issue of Journal of Performance Evaluation on Peer-to-Peer computing.
- Tutorials co-chair ACM/Sigmetrics 2005
- Program Committee ACM/Sigmetrics 2005
- Program Committee IEEE/Infocom 2005
- Local Arrangements Chair ACM/Sigmetrics and Performance 2004
- General Co-Chair, OpenSig 2003
- Program Committee IEEE/Infocom 2003
- Program Committee ICC Next Generation Internet Symposium 2003
- Program Committee 22nd IFIP WG 7.3 International Symposium on Computer Performance Modeling, Measurement and Evaluation (Performance 2002)
- Program Committee ACM/Sigmetrics 2002
- Program Committee ICC Next Generation Internet Symposium 2002
- Referee for submissions to the following professional conferences and journals: IEEE Transactions on Image Processing, IEEE Transactions on Automatic Control, IEEE Transactions on Networking, Automatica, Computer Networks, ICDAR 96, ICDAR 97, CVPR 96, Sigmetrics 1998, Sigmetrics 1999, Sigmetrics 2000, Sigmetrics 2001, Sigcomm 2000, Sigcomm 2001, Sigcomm 2002, Infocom 1999, Infocom 2000, Infocom 2001, Infocom 2002

DISSERTATIONS

Masters' Thesis

- **Simulation and Analysis of Self-Similar Processes** In my Masters' Thesis I developed analytical techniques based on wavelet models to detect self-similarity in stochastic processes. I also proposed simple algorithms for generating synthetic self-similar processes.

PhD Dissertation

- **Stochastic Models for Network Traffic** In my PhD dissertation I developed stochastic models which explain the behavior of network traffic. I modeled the behavior of TCP via a stochastic differential equation, that led to a fluid model. The fluid model forms the basis of much of the control theoretic analysis of TCP. The modeling additionally yielded a numerical technique which enables fast and accurate simulations of networks carrying TCP flows. I also developed Markovian models for Network traffic that explained long range dependence.

TEACHING

- Fall 2001: CSEE 3824, Computer Organization.
- Spring 2002: CSEE 4119, Computer Networks.
- Fall 2002: CSEE 4119, Computer Networks.
- Spring 2003: CSEE 6180, Modeling and Performance Evaluation
- Fall 2003: CSEE 4119, Computer Networks.
- Spring 2004: CSEE 6717, Information Theory.
- Fall 2004: CSEE 4119, Computer Networks.
- Spring 2005: CSEE 6180, Modeling and Performance Evaluation.
- Fall 2005: CSEE 4119, Computer Networks.
- Spring 2006: CSEE 6717, Information Theory.
- Fall 2006: CSEE 4119, Computer Networks.
- Spring 2007: CSEE 6180, Modeling and Performance Evaluation.
- Fall 2007: CSEE 4119, Computer Networks.
- Spring 2008: CSEE 4119, Computer Networks.
- Spring 2010: COMS 6998, Internet Economics.
- Fall 2010: CSEE 4119, Computer Networks.
- Fall 2013: CSEE 4119, Computer Networks.
- Spring 2014: CSEE 6180, Modeling and Performance Evaluation.
- Fall 2014: CSEE 4119, Computer Networks.
- Spring 2015: CSEE 6180, Modeling and Performance Evaluation.
- Fall 2015: CSEE 4119, Computer Networks.
- Spring 2016: CSEE 6180, Modeling and Performance Evaluation.
- Fall 2016: CSEE 4119, Data Center Networking.
- Spring 2017: CSEE 6180, Modeling and Performance Evaluation.

PHD STUDENTS

- Bong-Jun Ko (graduated Fall 2006, co-advised with Dan Rubenstein, now at IBM)
- Hoon Chang (graduated Summer 2007, now at Samsung Electronics, Seoul Korea)
- Hanhua Feng (graduated Fall 2007, now at IBM Watson, Hawthorne NY)
- Abhinav Kamra (graduated Fall 2007, co-advised with Dan Rubenstein, now at Citicorp)
- Patrick Lee (graduated Fall 2008, co-advised with Dan Rubenstein, now Assistant Professor in the CS department at the Chinese University of Hong Kong)
- Tianbai Ma (graduated Spring 2010, co-advised with Dan Rubenstein, now Assistant Professor at NUS Singapore)
- Eli Brosh (graduated Spring 2011, co-advised with Dan Rubenstein, now Director of Engineering at Vidyo Inc.)
- Joshua Reich (graduated Summer 2011, now at AT&T, co-advised with Dan Rubenstein)
- Kyung-Wook Hwang (graduated Summer 2013, now at AT& T, co-advised with Dan Rubenstein)
- Zeinab Abbassi (graduated, Spring 2016, now at Tomorrow Networks)
- Kevin Yang (in progress)
- Kunal Mahajan (in progress)
- Niloofar Bayat (in progress)