Fabián E. Bustamante

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RESEARCH INTEREST

Areas of Interest: Computer networks and distributed systems: Reliability, performance, network measurement, Internet-scale systems, content distribution, system design and deployment.

The goals of my research is to improve the visibility of measurements on networked systems, leveraging this visibility to characterize them and the infrastructure they rely on, and designing new and improved systems based on the gained insight.

EDUCATION

NORTHWESTERN UNIVERSITY, KELLOGG SCHOOL OF MANAGEMENT
Executive Education, Management Skills for Innovative University Leaders, 2009.

GEORGIA INSTITUTE OF TECHNOLOGY
Ph.D. Computer Science – December 2001
Dissertation *The Active Streams Approach to Distributed Applications and Services*
Advisor: Prof. Karsten Schwan

GEORGIA INSTITUTE OF TECHNOLOGY
M.S. Computer Science – December 1997

UNIVERSIDAD NACIONAL DE LA PATAGONIA SAN JUAN BOSCO, Argentina
Licenciado en Ciencias de la Computación (5-year-and-project degree) – March 1993

UNIVERSIDAD NACIONAL DE LA PATAGONIA SAN JUAN BOSCO, Argentina
Analista Programador Universitario (3-year degree) – April 1992

PROFESSIONAL EXPERIENCE

NORTHWESTERN UNIVERSITY, Evanston, IL – 2002-Present
Department of Electrical Engineering and Computer Science, McCormick School of Engineering
Assistant professor (2002 -2008), **Associate Professor** (2008-2014), **Professor** (2014-Present)

NORTHWESTERN UNIVERSITY, Evanston, IL – 2015-2019
Department of Computer Science (until 2019, Department of Electrical Engineering and Computer Science), McCormick School of Engineering
Associate Head for Computer Science

TRINITY COLLEGE, Dublin, Ireland – 2012-Present
School of Computer Science and Statistics
Adjunct Associate Professor

Universidad de Buenos Aires, Argentina – June-July 2012 — June-July 2017
Department of Computer Science
Visiting Professor

Trinity College, Dublin, Ireland – 2009
School of Computer Science and Statistics
E.T.S. Walton Visiting Research Fellow

Phenix Real Time Solutions, Inc., Chicago, IL – 2016-Present
Research Scientist (2016-2021), **Director of Research** (2021-Present)

College of Computing, Georgia Institute of Technology, 2001-2002
Research Scientist

College of Computing, Georgia Institute of Technology, 1997-2001
Graduate Research Assistant

Hewlett-Packard Labs – Palo Alto, Fall 1999
Research Intern

University of Maryland, College Park, Summer 1997
Visiting Researcher

HONORS AND AWARDS

Keynote speaker, TMA, Vienna, Austria, 2018.

Invited Speaker, TMA Expert Summit, Vienna, Austria, 2018.

Google Faculty Research Award, 2010, 2011, 2012, 2016.

External Advisory Board, mPlane: Building an Intelligent Measurement plane for the Internet, 2013-2015
(http://www.ict-mplane.eu)

Keynote speaker, mPlane Final Workshop, Heidelberg, Germany, 2015.

Steering Committee, IEEE International Conference on Peer-to-Peer Computing (P2P), 2013-2015

SIGCOMM Rising Star Award Committee, 2014.

Keynote speaker, Global Future Internet Summit, Seoul, Korea, 2012.

Fulbright Specialist, Since 2012.

Best Paper Award, ACM SIGCOMM Workshop on Measurement Up and Down the STack (W-MUST), 2012
(with Z. Bischof and J. Otto).

Apps For Metro Chicago Grand Challenge 2011, Second Place (Trailblaze), Fifth Place For Community Round
(Fixit!) And Fourth Place For Transportation Round (Trailblaze).

Senior Member of the IEEE, 2010.

Senior Member of the Association for Computing Machinery, 2008.

Science Foundation of Ireland E.T.S. Walton Visitor Award, 2008.

National Science Foundation, CAREER Award, 2007.

AGEP Professor - Midwest Crossroads AGEP (Alliances for Graduate Education and the Professoriate), 2005.

Best Paper Award, USENIX Annual Technical Conference - Freenix Track, 2004.

Searle Junior Fellow, Searle Center for Teaching Excellence, Northwestern U., 2003-2004.

HONORS AND AWARDS RECEIVED BY MY STUDENTS

Winner ACM Student Research Competition, Graduate Category, ACM SIGCOMM, *Rashna Kumar*, 2021.

Northwestern U. Outstanding Computer Science Senior Award *Robbert Belson (BS student)*, 2019.

Northwestern U. Greenbriar Research Fellowship *Robbert Belson (BS student)*, 2018.

EECS Department Outstanding Senior in Computer Science, *Nathan A. Lindquist (BS/MS student*, 2018.

JSPS Postdoctoral Fellowship, Japan Society for the Promotion of Science, *Zachary Bischof*, 2017.

Winner ACM Student Research Competition, Undergraduate Category, ACM SIGCOMM, *Angela Jiang (BS student)*, 2014.

Winner ACM Student Research Competition, Graduate Category, ACM SIGCOMM, *John Rula*, 2014.

EECS Department Outstanding Ph.D. Thesis, *John S. Otto*, 2013.

NSF/CRA Computing Innovations Fellowship, 2010-2012, *David R. Choffnes*, 2010-2012.

EECS Department Outstanding Ph.D. Thesis, *David R. Choffnes*, 2010.

PUBLICATIONS

(Acceptance rates provided when available.)

REFEREED PUBLICATIONS

1. Esteban Carisimo, Caleb Wang, Mia Weaver, Fabián E. Bustamanteand Paul Barford, "A hop away from everywhere: A view of the intercontinental long-haul infrastructure," *Proc. of ACM SIGMETRICS*, June 2024. (also Proc. ACM Meas. Anal. Comput. Syst. 7(3), 2023).

2. Rashna Kumar, Sana Asif, Elise Lee, and Fabián E. Bustamante, "Each at its own pace: Third-party Dependency and Centralization Around the World," *Proc. of ACM SIGMETRICS*, June 2023 (22% acceptance rate, 26/119).

3. Augusto Arturi, Esteban Carisimo, and Fabián E. Bustamante, "as2org+ : Enriching AS-to-Organization Mappings with PeeringDB," *Proc. of the International Conference on Passive and Active Measurements (PAM)*, March 2023 (34% acceptance rate, 27/80).

4. Sergi Alcalá-Marín, Aravindh Raman, Weili Wu, Andra Lutu, Marcelo Bagnulo, Ozgu Alay and Fabián E. Bustamante, "Global Mobile Network Aggregators: Taxonomy, Roaming Performance and Optimization Conference Forthcoming" *Proc. of ACM International Conference on Mobile Systems, Applications, and Services (MobiSys)*, June 2022 (22% acceptance rate, 38/176).

5. Matteo Varvello, Kleomenis Katevas, Mihai Plesa, Hamed Haddadi, Fabián E. Bustamante, Bel Livshits, "BatteryLab: A Collaborative Platform for Power Monitoring Conference", *Proc. of the International Conference on Passive and Active Measurements (PAM)*, March 2022 (48% acceptance rate, 30/62).

6. Byungjin Jun, Fabián E. Bustamante, Ben Greenstein and Ian Clelland, "Reining in Mobile Web Performance with Document and Permission Policies," *Proc. of the ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, March 2022 (42% acceptance rate, 18/43).

7. Sana Asif, Byungjin Jun, Fabián E. Bustamante, and John P. Rula, "Networked Systems as Witnesses - Association Between Content Demand, Human Mobility and an Infection Spread," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2021 (28% acceptance rate, 55/196).

8. Byungjin Jun, Matteo Varvello, Yasir Zaki and Fabián E. Bustamante, "WebTune: A Distributed Platform for Web Performance Measurements Conference," *Proc. of the IEEE/IFIP Network Traffic Measurement and Analysis Conference (TMA)*, September 2021 (45% acceptance rate, 18/40).

9. Andra Lutu, Diego Perino, Marcelo Bangulo and Fabián E. Bustamante, "Insights from Operating an IP Exchange Provider Conference," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, August 2021 (23% acceptance rate, 55/241).

10. Neil Agarwal, Matteo Varvello, Andrius Aucinas, James Newman, Fabián E. Bustamante, Ravi Netravali, "Mind the Delay: The Adverse Effects of Delay-Based TCP on HTTP," *International Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, December 2020 (24% acceptance rate, 40/168).

11. Shucheng Liu, Zachary S. Bischof, Ishaan Madan, Peter K. Chan and Fabián E. Bustamante, "Out of Sight, Not Out of Mind - A User-View on the Criticality of the Submarine Cable Network," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2020 (24.5% acceptance rate, 53/216).

12. Andra Lutu, Byungjin Jun, Alessandro Finamore, Fabián E. Bustamante, and Diego Perino, "Where Things Roam: Uncovering Cellular IoT/M2M Connectivity," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2020 (24.5% acceptance rate, 53/216).

13. Andra Lutu, Byungjin Jun, Fabián E. Bustamante, Diego Perino, Marcelo Bagnulo, Carlos Gamboa Bontje, "A first look at the IP eXchange Ecosystem," *arXiv preprint arXiv:2007.13809*, July 2020.

14. Yihan Zhang, Lyon Zhang, Hanlin Wang, Fabián E. Bustamante, Michael Rubenstein, "SwarmTalk – Towards Benchmark Software Suites for Swarm Robotics Platforms," *Proc. of AAMAS*, 2020.

15. Byungjin Jun, Fabián E. Bustamante, Sung Yoon Whang and Zachary S. Bischof, "AMP up your mobile web experience: Characterizing the impact of Google's Accelerated Mobile Project," *Proc. of the ACM International Conference On Mobile Computing And Networking (MobiCom)*, October 2019.

16. James Newman and Fabián E. Bustamante, "The Value of First Impressions: The Impact of Ad-Blocking on Web QoE," *Proc. of the International Conference on Passive and Active Measurements (PAM)*, March 2019.

17. James Newman, Robert H. Belson and Fabián E. Bustamante, "Scaling Up Your Experience, Everywhere," *Proc. of the ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, February 2019.

18. Zachary S. Bischof, Romain Fontugne and Fabián E. Bustamante, "Untangling the world-wide mesh of undersea cables," *Proc. of the ACM Workshop on Hot Topics in Networks (HotNets)*, November 2018.

19. Zachary S. Bischof, Fabián E. Bustamante, and Nick Feamster, "The Growing Importance of Being Always On A first look at the reliability of broadband Internet access," *Proc. of TPRC46*, September 2018.

20. Sarah Wassermann, John P. Rula, Fabián E. Bustamante, Pedro Casas. "Anycast on the Move: A Look at Mobile Anycast Performance," *Proc. of the IEEE/IFIP Network Traffic Measurement and Analysis Conference (TMA)*, June 2018.

21. John P. Rula, James Newman, Fabián E. Bustamante, Arash Molavi Kahki, David R. Choffnes, "Mile High WiFi: A First Look at In-Flight Internet Connectivity," *Proc. of the International Web Conference (WWW)*, April 2018.

22. John P. Rula, Fabián E. Bustamante, and Moritz Steiner, "Cell Spotting – Studying the Role of Cellular Networks in the Internet," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2017 (23% acceptance rate, 42/179).

23. Zachary S. Bischof, Fabián E. Bustamante, Rade Stanojevic, "The Utility Argument – Making a Case for Broadband SLAs," *Proc. of the International Conference on Passive and Active Measurements (PAM)*, March 2017 (23% acceptance rate, 20/87).

24. Dipendra Jha, John P. Rula, Fabián E. Bustamante, "eXploring Xfinity: A Frist Look at Provider-enabled Communication Networks,", *Proc. of the International Conference on Passive and Active Measurements (PAM)*, March 2016 (32% acceptance rate, 30/93).

25. John P. Rula, Fabián E. Bustamante, David R. Choffnes, "When IPs Fly: A Case for Redefining Airline Communication," *Proc. of the ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, February 2016 (33% acceptance rate, 18/55).

26. Zachary S. Bischof, John P. Rula, Fabián E. Bustamante, "In and Out of Cuba: Characterizing Cuba's Connectivity," *Proc. of the ACM Internet Measurement Conference (IMC)*, October 2015 (26% acceptance rate, 44/169).

27. John P. Rula and Fabián E. Bustamante. "Crowdsensing Under (Soft) Control," *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, April/May 2015 (19% acceptance rate, 316/1640).

28. John Rula, Byungjin Jun, Fabián E. Bustamante, "Mobile AD(D): Estimating Mobile App Session Times for Better Ads", *Proc. of the ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, February 2015 (28.75% acceptance rate, 23/80).

29. Arnau Gavaldá-Miralles, John S. Otto, Fabián E. Bustamante, Luõs A N. Amaral, Jordi Duch and Roger Guimera, "User Behavior and Change: File-sharers and Copyright Laws," *International Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, December 2104 (20% acceptance rate, 37/186).

30. Zachary S. Bischof, Fabián E. Bustamante, and Rade Stanojevic, "Need, Want, Can Afford – Broadband Markets and the Behavior of Users," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2014 (23% acceptance rate, 43/188).
    Runner-up for Best Paper Award

31. John P. Rula and Fabián E. Bustamante, "Behind the Curtain – Cellular DNS and Content Replica Selection", *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2014 (23% acceptance rate, 43/188).

32. Mario A. Sánchez, Fabián E. Bustamante, Balachander Krishnamurthy, Walter Willinger, Georgios Smaragdakis, Jeffery Erman, "Internet Inter-Domain Traffic Estimation for the Outsider," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2014 (23% acceptance rate, 43/188).

33. Emden R. Gansner, Balachander Krishnamurthy, Walter Willinger, Fabián E. Bustamante, Mario A. Saánchez: Demo abstract: towards extracting semantics by visualizing large traceroute datasets. *Computing*, 96(1), 2014.

34. John Rula, Vishnu Navda, Fabián E. Bustamante, Ranjita Bhagwan and Saikat Guha, "No 'one-size fits all': Towards a principled approach for incentives in mobile crowdsourcing, " *Proc. of the ACM Workshop on Mobile Computing Systems and Applications (HotMobile)*, February 2014.

35. John S. Otto and Fabián E. Bustamante, "The Hidden Locality in Swarms," *Proc. of the IEEE International Conference on Peer-to-Peer Computing (P2P)*, September 2013 (31% acceptance rate, 29/94).

36. Mario A. Sánchez, John S. Otto, Zachary S. Bischof, David R. Choffnes, Fabián E. Bustamante, Balachander Krishnamurthy and Walter Willinger, "Dasu: Pushing Experiments to the Internet's Edge," *Proc. of the USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, April 2013 (22% acceptance rate, 38/171).

37. Mario A. Sánchez, John S. Otto, Zachary S. Bischof and Fabián E. Bustamante, "Trying broadband characterization at home," *Proc. of the Passive and Active Measurement Conference (PAM),* March 2013 (32% acceptance rate, 24/74).

38. John S. Otto, Mario A. Sánchez, John P. Rula and Fabián E. Bustamante, "Content Delivery and the Natural Evolution of DNS," *Proc. of the ACM Internet Measurement Conference (IMC)*, November 2012 (24% acceptance rate, 45/183).

39. Zachary S. Bischof, John S. Otto, and Fabián E. Bustamante, "Up, Down and Around the Stack: ISP Characterization from Network Intensive Applications," *Proc. ACM SIGCOMM Workshop on Measurements Up the STack (W-MUST),* August 2012. *Best paper; Selected for publication in SIGCOMM CCR Special Issue, 42(4), October 2012.*

40. John S. Otto, Mario A. Sánchez, John P. Rula, Ted Stein, and Fabián E. Bustamante. "namehelp - Intelligent, Client-Side DNS Resolution", Demo Session, *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, August 2012.

41. John Rula and Fabián E. Bustamante, "Crowd (Soft) Control: Moving Beyond Opportunistic Sensing," *Proc. of the ACM Workshop on Mobile Computing Systems and Applications (HotMobile),* February 2012.

42. Zachary S. Bischof, John S. Otto and Fabián E. Bustamante, "Distributed Systems and Natural Disasters – BitTorrent as a Global Witness," *International Conference on emerging Networking EXperiments and Technologies (CoNEXT)– Special Workshop on Internet and Disasters (WoID),* December 2011.

43. Mario A. Sánchez, John S. Otto, Zachary S. Bischof, and Fabián E. Bustamante. "Dasu - ISP Characterization from the Edge: A BitTorrent Implementation", Demo Session, *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, August 2011.

44. John S. Otto, Mario A. Sánchez, David R. Choffnes, Fabián E. Bustamante, and Georgos Siganos, "On Blind Mice and the Elephant – Understanding the Network Impact of a Large Distributed Systems," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, August 2011 (14% acceptance rate, 32/223).

45. Zachary S. Bischof, John S. Otto, Mario A. Sánchez, John P. Rula, David R. Choffnes, and Fabián E. Bustamante, "Crowdsourcing ISP Characterization to the Network Edge," *Proc. ACM SIGCOMM Workshop on Measurements Up the STack (W-MUST),* August 2011.

46. Gareth Bennett, Eoin A. King, Jan Curn, Vinny Cahill, Fabián E. Bustamante, and Henry J. Rice, "Environmental Noise Mapping Using Measurements in Transit," *Proc. of the International Conference on Noise and Vibration Engineering (ISMA),* September 2010.

47. David R. Choffnes, Fabián E. Bustamante, Zihui Gao, "Crowdsourcing Service-Level Network Event Detection," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, August 2010 (12% acceptance rate, 33/276).

48. David R. Choffnes, Jordi Duch, Dean Malmgren, Roger Guimera, Fabián E. Bustamante, Luís Amaral, "Strange Bedfellows: Communities in BitTorrent," *Proc. of the International Workshop on Peer-to-Peer Systems (IPTPS)*, April 2010 (20% acceptance rate, 13/64).

49. David R. Choffnes, Mario A. Sánchez, Fabián E. Bustamante, "Network positioning from the edge: An empirical study of the effectiveness of network positioning in P2P systems," *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*(miniconference), March 2010 (24% acceptance rate, 382/1575).

50. Kai Chen, David R. Choffnes, Rahul Potharaju, Yan Chen, Fabián E. Bustamante, Dan Pei, Yao Zhao, "Where the Sidewalk Ends: Extending the Internet AS Graph Using Traceroutes From P2P Users," *International Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, December 2009 (17% acceptance rate, 29/170).

51. John S. Otto and Fabián E. Bustamante, "Distributed or Centralized Traffic Advisory Systems – The Application's Take," *Proc. of IEEE SECON*, June 2009 (18.8% acceptance rate, 81/431).

52. John S. Otto, Fabián E. Bustamante, and Randall Berry, "Down the Block and Around the Corner: The Impact of Radio Propagation on Inter-vehicle Wireless Communication," *Proc. of the International Conference on Distributed Computing Systems (ICDCS)*, June 2009 (16% acceptance rate, 74/455).

53. David R. Choffnes and Fabián E. Bustamante, "On the Effectiveness of Measurement Reuse for Performance-Based Detouring," *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, April 2009 (20% acceptance rate, 282/1435).

54. David R. Choffnes and Fabián E. Bustamante, "Taming the Torrent: A Practical Approach to Reducing Cross-ISP Traffic in Peer-to-Peer Systems," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, August 2008 (12% acceptance rate, 36/288).

55. Ao-Jan Su, David R. Choffnes, Fabián E. Bustamante, and Aleksandar Kuzmanovic, "Relative Network Positioning via CDN Redirections," *Proc. of the International Conference on Distributed Computing Systems (ICDCS)*, June 2008.

56. Jack Lange, Peter Dinda and Fabián E. Bustamante. "Vortex: Enabling Cooperative Selective Wormholing for Network Security Systems," *Proc. of the International Symposium on Recent Advances in Intrusion Detection (RAID)*, September 2007 (*16% acceptance rate, 16/101*).

57. David R. Choffnes and Fabián E. Bustamante, "Exploiting Emergent Behavior for Inter-Vehicle Communication," *Proc. of International Workshop on Hot Topics in Autonomic Computing (HotAC)*, June 2007 (*29% acceptance rate, 5/17*).

58. Guohan Lu, Yan Chen, Stefan Birrer, Fabián E. Bustamante, Chin Yin Cheung and Xing Li. "End-to-end Inference of Router Packet Forwarding Priority," *Proc. of IEEE International Conference on Computer Communications (INFOCOM)*, May 2007 (*18% acceptance rate, 252/1404*).

59. Stefan Birrer and Fabián E. Bustamante. "Resilience in Overlay Multicast Protocols," *Proc. of the IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)*, September 2006.

60. Ao-Jan Su, David R. Choffnes, Aleksandar Kuzmanovic, and Fabián E. Bustamante. "Drafting Behind Akamai (Travelocity-Based Detouring)," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, September 2006 (*10% acceptance rate, 37/345*).

61. Yi Qiao and Fabián E. Bustamante. "Structured and Unstructured Overlays Under the Microscope: A Measurement-based View of Two P2P Systems That People Use," *Proc. of USENIX Annual Technical Conference* (Full Paper), June 2006 (*13.7% acceptance rate, 21/153*).

62. David R. Choffnes and Fabián E. Bustamante, "An Integrated Mobility and Traffic Model for Vehicular Ad Hoc Networks," *Proc. of ACM International Workshop on Vehicular Ad Hoc Networks (VANET)* (Full Paper), September 2005 (*26.7% acceptance rate, 8/30*).

63. Stefan Birrer and Fabián E. Bustamante, "Magellan: Performance-based, Cooperative Multicast," *Proc. of the International Workshop on Web Content Caching and Distribution (WCW)*, September 2005 (*28.6% acceptance rate, 10/35*).

64. Stefan Birrer and Fabián E. Bustamante. "The Feasibility of DHT-based Streaming Multicast," *Proc. of the IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)*, September 2005.

65. Yi Qiao and Fabián E. Bustamante. "Elders Know Best - Handling Churn in Less Structured P2P Systems," *Proc. of the IEEE International Conference on Peer-to-Peer Computing (P2P)*, September 2005 (*19.1% acceptance rate, 26/136*).

66. David R. Choffnes and Fabián E. Bustamante, "STRAW - An Integrated Mobility and Traffic Model for VANETs," *Proc. of International Command and Control Research and Technology Symposium (ICCRTS)*, June 2005.

67. Dong Lu, Yi Qiao, Peter Dinda, and Fabián E. Bustamante, "Characterizing and Predicting TCP Throughput on the Wide Area Network," *Proc. of the International Conference on Distributed Computing Systems (ICDCS)*, June 2005 (*13.8% acceptance rate*).

68. Dong Lu, Yi Qiao, Peter Dinda, Fabián E. Bustamante, "Modeling and Taming Parallel TCP on the Wide Area Network," *Proc. of IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, April 2005 (*12% acceptance rate, 60/505*).

69. Stefan Birrer and Fabián E. Bustamante. "Nemo - Resilient Peer-to-Peer Multicast without the Cost," *Proc. of the Annual Multimedia Computing and Networking Conference (MMCN)*, January 2005 (*24% acceptance rate, 24/100*).

70. Yi Qiao, Dong Lu, Fabián E. Bustamante, and Peter Dinda, "Looking at the Server-Side of Peer-to-Peer Systems," *Proc. of the Workshop on Languages, Compilers and Run-time Support for Scalable Systems (LCR)*, October 2004 (*25% acceptance rate*).

71. Stefan Birrer, Dong Lu, Fabián E. Bustamante, Yi Qiao and Peter Dinda, "FatNemo: Building a Resilient Multi-Source Multicast Fat-Tree," *Proc. International Workshop on Web Content Caching and Distribution (WCW)*, October 2004 (*30% acceptance rate, 15/50*).

72. Brian Cornell, Peter A. Dinda and Fabián E. Bustamante. "Wayback: A User-level Versioning File System for Linux," *Proc. of the USENIX Technical Conference (Freenix Track)*, June 2004. (*24.6% acceptance rate, 15/61*).**Best Paper**

73. Patrick Widener, Karsten Schwan, and Fabián E. Bustamante. "Differential Data Protection for Dynamic Distributed Applications," *Proc. Annual Computer Security Applications Conference (ACSAC)*, December 2003.

74. Fabián E. Bustamante and Yi Qiao, "Friendships that last: Peer lifespan and its role in P2P protocols," *Proc. International Workshop on Web Content Caching and Distribution (WCW)*, Sep.-Oct. 2003 (*32.6% acceptance rate, 15/46*).

75. Fabián E. Bustamante, Greg Eisenhauer, Karsten Schwan, and Patrick Widener. "Scalable Directory Services Using Proactivity," *Proc. of the ACM/IEEE Conference on Supercomputing (SC)*, November 2002 (*29% acceptance rate*).

76. Fabián E. Bustamante, Christian Poellabauer and Karsten Schwan, "AIMS: Robustness Through Sensible Introspection," *Proc. of the ACM SIGOPS European Workshop* (Extended Abstract), September 2002.

77. Greg Eisenhauer, Fabián E. Bustamante, and Karsten Schwan. "A Middleware Toolkit for Client-Initiated Service Specialization," *Proc. of Principles of Distributed Computing (PODC) Middleware Symposium*, July 2000. Also appears in *ACM SIGOPS*, Vol 35, No. 2, pp. 7–20, April 2001.

78. Fabián E. Bustamante, Greg Eisenhauer, Patrick Widener, and Calton Pu, "Active Streams: An Approach to Adaptive Distributed Systems," *Proc. of Workshop on Hot Topics in Operating Systems (HotOS-VIII)*, May 2001.

79. Fabián E. Bustamante, Greg Eisenhauer, Karsten Schwan, and Patrick Widener. "Efficient Wire Formats for High Performance Computing," *Proc. of the ACM/IEEE Conference on Supercomputing (SC)*, November 2000. **Runner-up for Best Student Paper Award**

80. Greg Eisenhauer, Fabián E. Bustamante, and Karsten Schwan. "Event Services for High Performance Computing," *Proc. of ACM International Symposium on High Performance Distributed Computing (HPDC)*, August 2000.

81. Fabián E. Bustamante and Karsten Schwan. "Active I/O Streams for Heterogeneous High Performance Computing," *Proc. of Parallel Computing (ParCo)*, August 1999 (*30% acceptance rate*).

82. Asmara Afework, Michael Benyon, Fabián E. Bustamante, Angelo DeMarzo, Renato Ferreira, Rovert Miller, Mark Silberman, Joel Saltz, Alan Sussman. "Digital Dynamic Telepathology - the Virtual Microscope," *Proc. of the AMIA Annual Fall Symposium*, August 1998.

83. Mustaque Ahamad, Raja Das, Karsten Schwan, Fabián E. Bustamante, Todd Rose, and Dong Zhou,x "Objent: A Framework for High-End Collaborative Applications," *Proc. of the Dartmouth Workshop on Transportable Agents*, February 1997.

JOURNAL ARTICLES

1. Esteban Carisimo, Caleb Wang, Mia Weaver, Fabián E. Bustamanteand Paul Barford, "A hop away from everywhere: A view of the intercontinental long-haul infrastructure," Proc. ACM Meas. Anal. Comput. Syst. 7(3), 2023 (also *Proc. of ACM SIGMETRICS*, June 2024).

2. Fabián E. Bustamante, David Clark, and Nick Feamster. "Workshop on Tracking Quality of Experience in the Internet: Summary and Outcomes," *SIGCOMM CCR,* 47(1), January 2017.

3. Alireza Taelbpour, Hani S. Mahmassani, Fabián E. Bustamante, "Modeling Driver Behavior in a Connected Environment: Integrated Microscopic Simulation of Traffic and Mobile Wireless Telecommunication Systems," *Annual Meeting of the Transportation Research Board; Transportation Research Record*, March 2016.

4. Arnau Gavaldá-Miralles, David R. Choffnes, John S. Otto, Mario Sánchez, Fabián E. Bustamante, Luís A N. Amaral, Jordi Duch and Roger Guimera, "Impact of heterogeneity and socio-economic factors on massive decentralized sharing ecosystems," *Proc. of the National Academy of Science (PNAS)*, 111(43), October 2014.

5. Mario A. Sánchez, John S. Otto, Zachary S. Bischof, David R. Choffnes, Fabián E. Bustamante, Balachander Krishnamurthy and Walter Willinger. A measurement experimentation platform at the Internet's edge, *IEEE/ACM Transactions on Networking*, 23(6), September 2014.

6. Kai Chen, David R. Choffnes, Rahul Potharaju, Yan Chen, Fabián E. Bustamante, Dan Pei and Yao Zhao, "Where the sidewalk ends: Extending the Internet AS graph using traceroutes from P2P users," *IEEE Transactions on Computers*, 63(4), April 2014.

7. Zachary S. Bischof, John S. Otto, and Fabián E. Bustamante, "Up, Down and Around the Stack: ISP Characterization from Network Intensive Applications," *ACM SIGCOMM CCR,* Special Issue, 42(4), October 2012. Originally published in *Proc. ACM SIGCOMM Workshop on Measurements Up the STack (W-MUST),* August 2012.

8. kc claffy, Emile Aben, Jordan Auge, Robert Beverly, Fabián E. Bustamante, Benoit Donnet, Timur Friedman, Marina Fomenkov, Peter Haga, Matthew Luckie, and Yuval Shavitt, "The 2nd Workshop on Active Internet Measurements (AIMS-2) Report," *ACM SIGCOMM CCR,* 40(5), October 2010.

9. David R. Choffnes and Fabián E. Bustamante, "Pitfalls for Testbed Evaluations of Internet Systems," *ACM SIGCOMM CCR,* 40(2), April 2010.

10. David R. Choffnes and Fabián E. Bustamante, "Taming the Torrent," *USENIX ;login:,* February 2010.

11. Guohan Lu, Yan Chen, Stefan Birrer, Fabián E. Bustamante, and Xing Li, "POPI: A User-level Tool for Inferring Router Packet Forwarding Priority," *IEEE/ACM Transactions on Networking (ToN),* 18(1):1-14, February 2010.

12. Ao-Yan Su, David R. Choffnes, Aleksandar Kuzmanovic and Fabián E. Bustamante, "Drafting Behind Akamai: Inferring Network Conditions Based on CDN Redirections," *IEEE/ACM Transactions on Networking,,* 17(6):1752-1765, February 2008.

13. Yi Qiao, Dong Lu, Fabián E. Bustamante, Peter Dinda and Stefan Birrer, "Improving Peer-to-Peer Performance Through Server-Side Scheduling," *ACM Transactions on Computer Systems*, 26(4), December 2008.

14. Fabián E. Bustamante and Yi Qiao, "Designing Less-structured P2P Systems for the Expected High Churn," *IEEE/ACM Transactions on Networking*, 16(3):617-627, June 2008.

15. Stefan Birrer and Fabián E. Bustamante, "A Comparison of Resilient Overlay Multicast Approaches," *IEEE Journal on Selected Areas in Communications (JSAC) – Special Issue on Advances in Peer-to-Peer Streaming Systems*, 25(9):1695–1705, December 2007.

16. Greg Eisenhauer, Fabián E. Bustamante and Karsten Schwan, "Publish-subscribe for high-performance computing," *IEEE Internet Computing - Asynchronous Middleware and Services*, 10(1): 8-25, January/February 2006.

17. Greg Eisenhauer, Fabián E. Bustamante and Karsten Schwan, "Native Data Representation: An Efficient Wire Format for High-Performance Computing," *IEEE Transaction on Parallel and Distributed Systems*, 13(12):1234-1246, December 2002.

18. Patrick Widener, Greg Eisenhauer, Karsten Schwan, and Fabián E. Bustamante, "Open Metadata Formats: Efficient XML-Based Communication for High Performance Computing," *Cluster Computing: The Journal of Networks, Software Tools, and Applications*, 5(3): 315-324, July 2002 (Invited submission).

19. Greg Eisenhauer, Fabián E. Bustamante and Karsten Schwan, "Event Services in High Performance Systems," *Cluster Computing: The Journal of Networks, Software Tools, and Applications*, 4(3): 243-252, July 2001 (Invited submission).

REFEREED POSTERS AND WORK-IN-PROGRESS PRESENTATIONS

1. Kedar Thiagarajan, Rashna Kumar, Fabián E. Bustamante, "A Peek Backstage: Organizations in DNS Resolver Hierarchies," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, Poster Session, August 2023.

2. Rashna Kumar and Fabián E. Bustamante, "Decentralization, privacy and performance for DNS," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, Poster Session, August 2021.
   Winner ACM SRC Competition, Graduate Category

3. Matteo Varvello, Kleomenis Katevas, Wei Hang, Mihai Plesa, Hamed Haddadi, Fabián E. Bustamante, Benjamin Livshits, "BatteryLab, a distributed power monitoring platform for mobile devices: demo abstract," *Proc. of SenSys*, 2019.

4. Angela Jiang, Zach Bischof and and Fabián E. Bustamante. "A Cliq of Content Curators," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, Poster Session, August 2014.
   Winner ACM Student Research Competition, Undergraduate Category

5. John P. Rula and Fabián E. Bustamante. "Behind the Curtain: The Importance of Replica Selection in Next Generation Cellular Networks," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, Poster Session, August 2014.
   Winner ACM Student Research Competition, Graduate Category

6. Zach Bischof and and Fabián E. Bustamante. "A Time for Reliability – The Growing Importance of Being Always On," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, Poster Session, August 2014.

7. Zachary S. Bischof, Mario A. Sánchez, John S. Otto, John P. Rula, and Fabián E. Bustamante. "Characterizing Broadband Services with Dasu", *Proc. of the USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Demo Session, April 2013.

8. Mario A. Sánchez, John S. Otto, Zachary S. Bischof, David R. Choffnes, and Fabián E. Bustamante. "Experiments at the Internet's Edge with Dasu", *Proc. of the USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Demo Session, April 2013.

9. John S. Otto, Fabián E. Bustamante and Randall A. Berry. "Turning the Corner in the City – The Impact of Radio Propagation on Inter-vehicle Wireless Communication,' *Workshop on Mobile Computing Systems and Applications (HotMobile)*, ' Poster Session, February 2009.

10. David R. Choffnes and Fabián E. Bustamante. "NEWS: Crowd Sourcing Network Anomaly Detection," *USENIX Symposium on Operating Systems Principles (OSDI)*, Poster Session, December 2008.

11. David R. Choffnes and Fabián E. Bustamante. "SideStep - Scalable Detouring by Reusing CDN Measurements," *ACM Symposium on Operating Systems Principles (SOSP)*, Poster Session, October 2007.

12. Ashish Gupta, Peter Dinda and Fabián E. Bustamante. "Distributed Popularity Indices," *Proc. of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, Poster Session, August 2005.

13. Stefan Birrer, Fabián E. Bustamante, Dong Lu, Peter Dinda and Yi Qiao. "FatNemo: Multi-Source Multicast Overlay Fat-Tree," *Proc. of the USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Poster Session, May 2005.

14. Ashish Gupta, Manan Sanghi, Peter Dinda and Fabián E. Bustamante. "Magnolia: A novel DHT architecture for keyword-based searching," *Proc. of the USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, Poster Session, May 2005.

15. Dong Lu, Peter Dinda, Yi Qiao, Huanyuan Sheng, Fabián E. Bustamante, "Applications of SRPT Scheduling with Inaccurate Scheduling Information," *IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS)*, Poster Session, October 2004.

16. Yi Qiao and Fabián E. Bustamante. "Elders Know Best: Lifespan-based Ideas in P2P Systems," *ACM Symposium on Operating Systems Principles (SOSP)*, Work-In-Progress Session, October 2003.

17. Fabián E. Bustamante, Greg Eisenhauer, Karsten Schwan and Patrick Widener. "Active Streams and the Effects of Stream Specialization," *ACM International Symposium on High Performance Distributed Computing (HPDC)*, Poster Session, August 2001.

18. Fabián E. Bustamante, Patrick Widener, and Karsten Schwan. "A Case for Proactive Directory Services," *ACM/IEEE Conference on Supercomputing (SC)*, Poster Session, November 2001.

EDITED PROCEEDINGS

1. Pedro Casas, Florian Wamser, Fabián E. Bustamante, David R. Choffnes, "Proc. of the 2019 Workshop on QoE-based Analysis and Management of Data Communication Networks," Internet-QoE@MobiCom, 2019.

2. Pedro Casas, Florian Wamser, Fabián E. Bustamante, David R. Choffnes, "Proc. of the 2017 Workshop on QoE-based Analysis and Management of Data Communication Networks," Internet-QoE@SIGCOMM, August 2017.

3. Pedro Casas, Fabián E. Bustamante, Martín Varela, David R. Choffnes, "Proc. of the 2016 workshop on QoE-based Analysis and Management of Data Communication Networks," Internet-QoE@SIGCOMM, August 2016.

4. Fabián E. Bustamante, Balachander Krishnamurthy, Walter Willinger, "Proc. of the 2015 ACM SIGCOMM Workshop on Crowdsourcing and Crowdsharing of Big (Internet) Data," C2B(I)D@SIGCOMM, August 2015.

5. Fabián E. Bustamante, Y. Charlie Hu, Arvind Krishnamurthy, Sylvia Ratnasamy, "Proc. of the ACM SIGCOMM Conference, August 2014.

6. Fabián E. Bustamante and John Douceur, "Proc. of the 12th IEEE International Conference on Peer-to-Peer Computing (P2P)," September 2012.

7. Fabián E. Bustamante, "Proc. of the 3rd International Workshop on Hot Topics in Autonomic Computing (HotAC)," June 2008.

8. Fabián E. Bustamante and Emre Kiciman, "Proc. of the 2nd International Workshop on Hot Topics in Autonomic Computing (HotAC)," June 2007.

9. Fabián E. Bustamante and Jeffrey Kephart, "Proc. of the 1st International Workshop on Hot Topics in Autonomic Computing (HotAC)," June 2006.

NON-REFEREED PUBLICATIONS

1. Zachary Bischof, Romain Fontugne and Fabián E. Bustamante, "Untangling the worldwide mesh of undersea cables", Invited Blog Post for APNIC, April 2019. `https://blog.apnic.net/2019/04/05/untangling-the-worldwide-mesh-of-undersea-cables/`

2. Fabián E. Bustamante, John Rula and Moritz Steiner, "The role of cellular networks in the Internet", Invited Blog Post for APNIC, April 2018. `https://blog.apnic.net/2018/04/05/the-role-of-cellular-networks-i`

3. Fabián E. Bustamante, "Connecting Cuba to the Rest of the World," Pacific Standard, June 9, 2015. `https://psmag.com/environment/connecting-cuba-to-the-rest-of-the-world`

4. Fabián E. Bustamante, "Raise The Speed Limit: Assuring The Right To Affordable Broadband, " Forbes, Jan 21, 2015. `https://bit.ly/38eu97l`

5. Fabián E. Bustamante, "Broadly Available Broadband," *IEEE Internet Computing*, 17(5), Jan-Feb 2013.

6. John S. Otto, John P. Rula, and Fabián E. Bustamante, "C3R – Participatory Urban Monitoring from your Car," Tech. Report NWU-EECS-09-10, EECS, Northwestern University, 2009.

7. David R. Choffnes and Fabián E. Bustamante, "Modeling Vehicular Traffic and Mobility for Vehicular Wireless Networks," Tech. Report NWU-CS-05-03, Department of Computer Science, Northwestern University, 2005.

8. Fabián E. Bustamante, "Pacioli: A Framework for Model Construction," Tech. Report, Storage System Program, Computer Systems Laboratory, Hewlett-Packard Laboratory, February 2000. (Work done in collaboration with Guillermo Alvarez, Ralph Becker-Szendy, and John Wilkes)

9. Fabián E. Bustamante and Richard M. Fujimoto. "An Empirical Comparison of Time Warp and the NPSI Elastic Time Protocol," Tech. Report GIT-CC-97-13, College of Computing, Georgia Institute of Technology, 1997.

PATENTS

(US issued patents)

Fabián E. Bustamante, Stefan Birrer, Nicholas Los. "Insertion of targeted content in real-time streaming media."
US Patent 11,838,580, filed March 2022 and issued December 5, 2023.
Assignee: Phenix Real Time Solutions Inc.

Fabián E. Bustamante, S Birrer. "Flash crowd management in real-time streaming."
US Patent 11,736,404, filed September 16, 2022 and issued August 22, 2023.
Assignee: Phenix Real Time Solutions Inc.

Fabián E. Bustamante, Stefan Birrer. "Dynamic viewpoints of live event."
US Patent 11,792,444, filed October 31, 2021 and issued October 31, 2022.
US Patent 11,490,132, filed June 2, 2021 and issued November 1, 2022.
Assignee: Phenix Real Time Solutions Inc.

Fabián E. Bustamante, Stefan Birrer. "Simulating a local experience by live streaming sharable viewpoints of a live event,"
US 11,051,049, filed February 6, 2019, and issued June 29, 2021.
US 11,470,361, filed July 21, 2021, and issued October 11, 2022.
US 11,949,922, filed October 2022, and issued April 2, 2024. Assignee: Phenix Real Time Solutions Inc.

Stefan Birrer, Fabián E. Bustamante. "Adaptive bit-rate methods for live broadcasting."
US Patent 11,019,368, filed June 2, 2022, and issued July 25, 2023.
US Patent 11,363,312, filed April 21, 2021, and issued June 14, 2022.
US Patent 11,019,368, filed April 26, 2019, and issued May 25, 2021.
Assignee: Phenix Real Time Solutions Inc.

Stefan Birrer, Fabián E. Bustamante, Andrew Weiner. "Method and apparatus for synchronizing applications'
   consumption of remote data."
   US Patent 10,601,914, filed April 9, 2018, and issue March 24, 2020.
   US Patent 10,855,763, filed February 12, 2020, and issue December 1, 2020.
   Assignee: Phenix Real Time Solutions Inc.

G. Alvarez, Fabián E. Bustamante, R. Becker-Szendy and J. Wilkes. "Technique for programmatically obtaining
   experimental measurements for model construction."
   US Patent 7,505,886, filed September 3, 2002, and issued March 17, 2009.
   Assignee: Hewlett-Packard Development Co LP.

SOFTWARE ARTIFACTS

1. **User-View on the Criticality of the SCN** ? Code and dataset accompanying the paper "Out of Sight,
   Not Out of Mind ? A User-View on the Criticality of the Submarine Cable Network", Proc. of IMC 2020.
   `https://github.com/NU-AquaLab/Criticality-SCN`

2. **Middle-Box Zero (MBZ)** ? An extensible platform that can intercept and modify traffic before leaving
   the device or, on arrival, before reaching the operating system. Conceptually, this is the same view of the
   traffic that a traditional middlebox would have at the far end of the first link in the network path.
   `https://github.com/NU-AquaLab/MBZ`

3. *ScaleUp* – A Chrome extension that measures your IFC experience and dynamically adjust every web page
   you load to improve your quality of experience while browsing.
   (http://www.aqualab.cs.northwestern.edu/projects/339-scaleup)
   (https://chrome.google.com/webstore/detail/scale-up/nccpekdjgfpoebbjipneaanfinpjppbh?hl=en-US)

4. *WiFly* – Characterizing in-flight communication. A web and app that inform users of current and past
   experiences (comparables) with in-flight communication.
   `http://www.aqualab.cs.northwestern.edu/projects/317-in-flight-connectivity`
   `https://play.google.com/store/apps/details?id=wifly.aqualab.northwestern.edu.wifly`

5. *AppT* – Understanding usage patters of mobile apps, while you move.
   `http://www.aqualab.cs.northwestern.edu/projects/appt`
   `https://play.google.com/store/apps/details?id=edu.northwestern.aqualab.appt`

6. *namehelp mobile* – A mobile app (for Android) inspired by namehelp. The app inform users of their best
   DNS option even if currently, cellular operators lock down the choice of DNS service on their devices,
   limiting consumer choice.
   `https://play.google.com/store/apps/details?id=edu.northwestern.aqualab.namehelp`

7. *Signal v2* – A student-designed mobile app that lets you easily report WiFi and cellular dead spots around
   campus – regardless of whether or not you have a working connection at the moment. In collaboration with
   the researchers at Northwestern's Aqualab, NUX is aggregating the data from these reports to help NUIT
   identify areas where wireless connectivity can be improved.
   `https://nux.northwestern.edu/projects/nu-signals-v2`

8. *namehelp* – An extensible proxying DNS server that allows users to get the benefits of third-party DNS
   servers (e.g. Google Public DNS) while avoiding the performance penalty for CDN-hosted content normally
   incurred when using remote DNS.
   Over 144,000 users as of December 2016.
   `http://aqualab.cs.northwestern.edu/projects/namehelp`

9. *Dasu* – An extension to the popular Vuze/Azureus BitTorrent client. Dasu is a dual-objective system providing ISP characterization (including the detection of network interference) and supporting Internet measurement experimentation.
   Over 100,100 users as of December 2016.
   http://www.aqualab.cs.northwestern.edu/projects/Dasu.html

10. *FixIt!* – An app to crowdsource the report and report validation of issues requiring city attention such as broken streetlights, potholes, and graffiti. This app was awarded 5th place in the *Apps 4 Metro Chicago* challenge, *Community Round*.
    http://aqualab.cs.northwestern.edu/projects/fixit

11. *TrailBlaze Chicago* – An app to crowdsource the planning and status report of bike paths. This app came in 2nd in the *Apps 4 Metro Chicago Grand Challenge*, and 4th in the *Apps 4 Metro Chicago* Challenge, *Transportation Round* (and 1st among the not-for-profit!).
    http://aqualab.cs.northwestern.edu/projects/trailblaze-chicago

12. *SwarmScreen* – An extension to the popular Vuze/Azureus BitTorrent client to make it difficult to classify users' downloading behavior by looking at his/her connection patterns.
    http://www.aqualab.cs.northwestern.edu/projects/SwarmScreen.html

13. *NEWS* – A system for Network Early Warning System built by taking advantage of the natural P2P traffic. NEWS is implemented as plugin/extension for the BitTorrent Azureus client.
    Over 56,000 users as of December 2016.
    http://www.aqualab.cs.northwestern.edu/projects/NEWS.html

14. *SideStep/DraFTP* – The SideStep service reuses CDN information to locate quality overlay paths in the Internet with minimum overhead. We also implemented DraFTP, and open-source FTP suite that uses SideStep to improve download performance.
    http://www.aqualab.cs.northwestern.edu/projects/SideStep.html

15. *Ono* – A plugin/extension for the Azureus client that implements our proposed CDN-based positioning for peer selection in the popular BitTorrent system.
    Over 1,480,000 users as of December 2016.
    http://www.aqualab.cs.northwestern.edu/projects/Ono.html

16. *STRAW* – An integrated mobility and traffic model for Vehicular Ad-Hoc Networks (VANETs); STRAW's current implementation is written for the JiST/SWANS discrete-event simulator.
    http://www.aqualab.cs.northwestern.edu/projects/STRAW.html

17. *SWANS++* – An extension to the Jist/SWANS Discrete-event Simulator, including new/re-implementation of well-known protocols, mobility models and a steering/visualization tool.
    http://aqualab.cs.northwestern.edu/projects/swansplus2.html

18. *Ceratias* – Real-time visualization tool for the JiST/SWANS simulation platform. Also enables interaction with and online modification of the ongoing simulation, and can be detached/re-attached dynamically for performance.
    http://sourceforge.net/projects/straw/

19. *NUPastry, NUScribe, NUSplitStream* – Re-implementation of the Pastry DHT and the Scribe/SplitStream overlay multicast protocols.
    http://www.aqualab.cs.northwestern.edu/projects/streamoverlay.html

20. *Nemo* – Reference implementation of a structurally resilient, performance-centric overlay multicast protocol for streaming applications.
    http://www.aqualab.cs.northwestern.edu/projects/nemo.html

21. *Nixes Toolset* – A set of bash scripts to install, maintain, control and monitor applications on PlanetLab.
    http://www.aqualab.cs.northwestern.edu/nixes.html

22. *Gnutella peer session time traces* – Trace of the lifespans, or session lengths, of peers in the Gnutella network collected, through active measurement, during March 2003.
    http://www.aqualab.cs.northwestern.edu/lifeTrace.html

23. *PDS - A Proactive Directory Service* – An information repository supporting a proactive, dynamically customizable interface for client notifications.
    http://www-static.cc.gatech.edu/systems/projects/PDS/

24. *ECho - A High-performance Event Delivery System* – An event delivery middleware system for heterogeneous, high-performance applications (includes support for event typing, event handlers for transparent support of both inter- and intra-process communication, etc).
    http://www-static.cc.gatech.edu/systems/projects/ECho/

25. *PBIO - Portable Binary I/O Communication* – A portable binary communication library that implements our Native Data Representation (NDR) wire-format for handling binary data in storage and communication.
    http://www-static.cc.gatech.edu/systems/projects/PBIO/

26. *Virtual Microscope* – A client-server system that provides a realistic digital emulation of a high power light microscope.

27. *Pacioli* – A toolset for automatic model construction of large-scale RAID storage systems.

SELECTED MEDIA COVERAGE

(A small subset, grouped by topic.)

Is Internet Access a Right or a Privilege? – Interview by Erica Gunderson for WTTW Chicago (Public Television), June 2020.

Chrome extension speeds up in-flight browsing – Network World, 2017; News Atlas, 2017; Science Daily, 2017; CACM News 2017; Indian Express, 2017; Travel+Leisure, 2017.

Cuba's Internet connectivity - Northwestern McCormick News 2016; Phys.org, 2016.

Inflight WiFi - Northwestern McCormick News 2016; ChicagoInno 2016; Chicago Tribune, 2016.

On phone usage - Northwestern McCormick News, 2016; ACM TechNews, 2016.

Heterogeneity and socioeconomic factors in BitTorrent - Science, 2014; TechTimes, 2014; Slashdot, 2014; BBC News, 2014.

Namehelp and DNS - Network World, 2012; COot@mail.ru, 2012 (Rusia); IDG NOW, 2012 (Italy); PC World, 2012 (Vietnam); Spider's Web, 2012 (Poland); Lifehacker, 2012; Mia Lui, 2012 (Vietnam); Korben, 2012 (France); Chip.com.tr, 2013 (Turkey); Makeuseof, 2013; Dicas para computador, 2013 (Brazil).

Crowd Soft Control - Communications of the ACM, 2012, Wired, 2012, Discovery News, 2012.

Mobile apps for Metro Chicago - WBEZ 91.5, 2011; McCormick By Design, 2011.

Distributed systems and natural disasters - Ars Technica, 2011; McCormick By Design, 2011.

Shadowstream - Ars Technica, 2009; TheRegister.Co.Uk,2009 (UK); Slashdot, 2009; Punto Informatico, 2009 (Italy).

NEWS - REDORBIT, 2008; Slashdot, 2008; The Hindu, 2008, (India).

Ono - Slashdot, 2008; El Pais, 2008, (Spain); Chronicle of Higher Education, 2008.

GRANTS

"Conference: Towards Re-architecting Today's Internet for Survivability"
National Science Foundation, CNS 2332178

"CICI:TCR:STARNOVA: Scalable Technology to Accelerate Research Network Operations Vulnerability Alerts"
National Science Foundation, CNS 2319959 (Co-PI Ka Pui Mok and Kimberly Claffy, UCSD)

"NeTS: Small: Privacy and Performance over Third-party DNS"
National Science Foundation, CNS 2246475, 2023-2026

"A Global Index of Third-party Dependency and Centralization"
Comcast Innovation Fund, 2021

"Collaborative Research: CNS Core: Medium: On the Criticality of the Submarine Cable Network"
National Science Foundation, CNS 2107392, 2021-2025 (Lead P.I., Co-PI Paul Barford, U. of Wisconsin-Madison)

"Decentralization, Privacy, and Performance in DNS"
Comcast Innovation Fund, 2021

"An Extensible Middle-box Service for Mobile Devices"
Comcast Innovation Fund, 2018

"RAPID: Internet Traffic and Compliance with Government Stay-at-Home Measures"
National Science Foundation, CNS 2027922, 2020-2021 (Single P.I.)

"An Extensible Middle-box Service for Mobile Devices"
Comcast Innovation Fund, 2018

"CNS: NeTS: Broadband Service Reliability: Characterization and Improvement"
National Science Foundation Grant, 2016-2019 (Single P.I.)

"A first look at in-flight Internet connectivity"
Google Faculty Research Award, 2016 (Single P.I.)

"CNS: NeTS: A Dual-Objective Platform for Internet Experimentation"
National Science Foundation, CNS 1218287, 2012-2016 (Single P.I.)

"SoCS: Leveraging Shared Social Interest in Content Centric Internet"
  National Science Foundation, CNS 1211375, 2012-2016 (P.I. with Noshir Contractor)

Content Distribution and the Evolution of DNS
  Google Faculty Research Award, 2012 (Single P.I.)

Renewal: A Global View of ISP Interference According to P2P Users
  Google Faculty Research Award, 2011 (Single P.I.)

Collaborative Research: Enabling Exascale Hardware and Software Design through Scalable System Virtualization
  Department of Energy X-Stack Program, Sep. 2010 - Aug. 2013 (Co-P.I. with P. Dinda and Russ Joseph
  from Northwestern and collaborators from U. of New Mexico, Sandia National Labs, and Oak Ridge National
  Labs)

A Global View of ISP Interference According to P2P Users
  Google Faculty Research Award, 2010 (Single P.I.)

CNS: NeTS: Parallax – Leveraging the Perspective of Ten Million Peers
  National Science Foundation, CNS 0917233, Aug. 2009 - Jul. 2012 (P.I. with Yan Chen)

CRI: II-NEW: Sharing The Perspective of Ten Million Peers
  National Science Foundation, CNS 0855253, Jul. 2009 - Jun. 2012

Transportation Center Seed Grant: Understanding The Potential of Cooperative Foresight for Traffic Avoidance
  Transportation Center, McCormick School of Engineering and Applied Sciences, Northwestern U., May 2008
  (P.I.)

E.T.S. Walton Visitor Award
  Science Foundation of Ireland, May 2008 (Single P.I.)

Collaborative Research: CRI: CRD: An Open Source Extensible Virtual Machine Monitor
  National Science Foundation Grant: CNS 0709168, Sep. 2007 - Aug. 2011 (Co-P.I. with P. Dinda and Russ
  Joseph from Northwestern and B. Maccabe from U. New Mexico)

CAREER: Ensuring Sustainable Scalability for Globally-Distributed Systems
  National Science Foundation CAREER, CNS 0644062, Jan. 2007 - Dec. 2011

Neokast Fellowship
  Metis Enterprise Technologies LLC, August 2006

Motorola Undergraduate Research Grant, April 2006 (two grants)

Integrated Modular Trustworthy Computing Curriculum Development,
  Microsoft Research Trustworthy Computing Award, March 2005 (co-P.I. with Yan Chen, Peter Dinda and
  Aleksandar Kuzmanovic)

A Virtual Lab for Experimental Systems Education,
  Northwestern U. Murphy Society, October 2005 (P.I. with P. Dinda, B. Dennis, Y. Chen, and A. Kuzmanovic)

SUN Center of Excellence,
  Sun Microsystems, July 2005

Midwest Crossroads AGEP Professor,
  National Science Foundation, May 2005 (with faculty from Northwestern, Purdue and Indiana)

Ford Undergraduate Research Grant,
    Ford Foundation, Nov. 2004 (Co P.I. with R. Dick)

SUN Academic Excellence Grant,
    Sun Microsystems, Sep. 2003 (Equipment award)

STUDENT SUPERVISION

Postdocs

Esteban Carisimo, *March 2020 - Present*

Ph.D. Students

Rashna Kumar, *September 2019 - Present*

Kedar Thiagarajan *September 2022 - Present*

Caleb Wang *September 2022 - Present*

Byungjin Jun
    August 2023
    Title: Handling Scripts to Improve User's Web Experience on Any Network.

Zachary S. Bischof
    December 2016
    Title: Characterizing broadband services in a broader context – Vantage points, measurements, and experimentation.
    Winner of a postdoctoral fellowship for research from the Japan Society for the Promotion of Science
    Researcher at IIJ.

John P. Rula
    December 2016
    Title: Adopting a Gateway Centric View for Cellular Network Content Delivery.
    Senior Software Engineer, Akamai (2016-2021)
    CTO, nZero.

Mario A. Sánchez
    June 2014
    Title: Capturing the Internet's Edge at Scale Through a Measurement Platform Hosted by End Users.
    Production Engineer, Facebook.

John S. Otto
    December 2013
    Title: The Changing Face of Content Delivery: Implications for Clients, Content Providers, and the Network at Large.
    Winner of the EECS Department Outstanding Ph.D. Thesis
    Software Engineer, Google.

David R. Choffnes
    June 2010
    Title: Service-Level Network Event Detection from Edge System.
    Winner of the EECS Department Outstanding Ph.D. Thesis
    Nominated for ACM Dissertation Award
    Computing Innovation Fellow at University of Washington.
    Associate Professor, Northeastern University.

Stefan Birrer
December 2007
Title: Addressing the Limitations of Tree-based Approaches to High-Bandwidth Streaming Multicast
Graduated; now Principal at SempiTech Inc. and Software Professional at Symphonoe LLC. Past
President for Technology & Research and co-founder of Neokast LLC and Dosensio LLC.
Co-founder and Chief Software Architect, PhenixRTS.

M.S. Students

Adam Chen, BS/MS, *2023-Present*

Ph.D. Thesis Committees

Christopher Cummings – *Graduated 2022*
Senior Analyst, United Airlines.

Kaiyu Hou – *Graduated 2022*

Mark Warrior – *Graduated 2019*
Software Engineer, Truss Holdings, Inc.

Uri Klarman – *Graduated 2019*
CEO of bloXroute Labs.

Amr Elfar – *Graduated 2019*
Consultant, Bain & Company.

Zihan Hong – *Graduated 2017*.

Kyle Hale – *Graduated 2016*
Associate Professor at Illinois Institute of Technology.

Ning Xia – *Graduated 2015*
NEC Labs America.

Marcel Flores – *Graduated 2016*
Senior Research Scientist, Edgio.

Alireza Talebour – *Graduated 2015*
Assistant Professor at Texas A&M University.

Mihai Capotă (Delft University, Netherland) – *Graduated 2015*
Research Scientist, Intel labs.

Arnau Gavaldá-Miralles (Universitat Rovira i Virgili) – *Graduated 2014*
CEO Skyelement.

Kai Chen – *Graduated 2012*
Assistant professor at the Hong Kong University of Science and Technology.

Ao-Jan Su – *Graduated 2011*
TeleNav.

John R. Lange — *Graduated 2010*
Associate professor at the University of Pittsburg.

Ashish Gupta – *Graduated 2008*
Senior Software Engineer, Google.

Bin Lin – *Graduated 2007*
    Senior Research Engineer, Apple.

Ananth Sundararaj – *Graduated 2006*
    Senior Research Engineer, Microsoft.

Dong Lu – *Graduated 2005*
    Senior Software Developer at Tower Research Capital.

M.S. Students

Only terminal MS Ying Zhang (2023), Weili Wu (2023, now PhD student at Ga Tech), Robert Belson (BS/MS, now at Verizon), Sana Asif (2021, now at nZero), Alex Shucheng Liu (2021, now at Riot Games), Nathan A. Lindquist (BS/MS, now at Typco), James Whang (BS/MS, now at Microsoft), Rohit Mandrekar (2021), Yihan Zhang (2021), Wei Han (2020), Ishaan Madan (2020), Yishan Lin (2019), Prashanth Vsanthakrisnan (2019), Shixin Luo (2017), Sarah Wassermann (2017), Andrew Weiner (2017), Dipendra Kumar Jha (2015), Eric Lin (2014), Ted Stein (2013), William Ng (2012), Balasaheb Bagul (June 2012), Wei-Chih Lai (2012), Soyannwo Olusanya (2009), Xian Yi Teng, (2008), Yi Qiao (2004).

Undergraduate Students

Advisor for several undergraduates/graduates' independent studies; the following is only a partial list and their last known location.

Richard Jo, Olivia Gallager, Kevin McAfee, Michael Polniski, Andre Ehrlich, Ishaan Madan (now at Apple), Angela Jiang (later Ph.D. student at CMU), Alex Yi (later Ph.D. student at UIUC), Nikola Borisov (at a startup, selected among the 2010 *50 for The Future* by the Illinois Technology Foundation), Ted Stein (Amazon), Eugenia Gabrielova (Ph.D. student UC Irvine), John Rula (later Ph.D. from Northwestern), Aaron Johnson (Ph.D. from Yale), John Otto (later Ph.D. from Northwestern), Aaron Beach (Ph.D. from U. of Colorado), Brian Cornell (M.S. from U. of North Carolina at Chapel Hill, now at Google, also honorable mention for the CRA Outstanding Undergraduate Awards) and Robert Adolf (honorable mention for the CRA Outstanding Undergraduate Award).

TEACHING

(Student evaluations (mean over 6): [Course/Instruction | Amount Learned])

Advanced Networking (CS 440), Fall 2022. *Last student evaluation:* 4 | 5

Introduction to Computer Networking (CS 340), Fall 2020. *Last student evaluation:* 4 | 5

Introduction to Graduate Studies (CS 496), Fall 2018, Fall 2019, Fall 2020, Fall 2021.
    Last student evaluation: 5 | 5

Distributed Systems (CS 345; undergraduate course), Spring 2003, Winter 2005, Winter 2008, Winter 2010, Winter 2012, Winter 2013, Winter 2014, Spring 2015, Spring 2017, Spring 2018, Spring 2019, Spring 2020, Spring 2021, Spring 2022, Spring 2024.
    Last student evaluation: 4.68 | 4.49

Operating Systems (EECS 343; undergraduate course), Fall 2002-2017.
    Last student evaluation: 5.06 | 5.31

Internet-scale Experimentation (CS 445), Winter 2012, Winter 2015, Winter 2016, Winter 2017, Winter 2019, Winter 2023, Winter 2024.
  Last student evaluation: 5 | 5.33

Advanced Operating Systems (CS 443; graduate course), Winter 2003, Spring 2005, Winter 2007, Winter 2009.
  Last student evaluation: 5.6 | 5.6

Distributed Systems in Challenging Environments (CS 395/495), Spring 2008, Winter 2011, Spring 2012, Spring 2014, Winter 2018, Winter 2022.
  Last student evaluation: 4.6 | 5

Introduction to Computer Systems (CS 213; undergraduate course), Spring 2007, Spring 2010, Spring 2011, Spring 2012.
  Last student evaluation: 4.68 | 5.08

Autonomic Computing Systems (CS 395/495; graduate course), Winter 2006.
  Last student evaluation: 4.67 | 6 (only data available)

NSRG Systems Reading Group (EECS 399/499).

Undergraduate and Graduate Independent Projects (EECS 399/499).

Peer-to-Peer Computing (MSIT-491; Master of Science in Information Technology Program).

COURSE DEVELOPMENT

Introduction to Computer Networking (CS 340). An introduction to the basics of networking, particularly focusing on the engineering of the Internet.

Introduction to Graduate Studies (CS 496). An introduction to graduate studies in Computer Science at Northwestern organized for the incoming Ph.D. students.

Distributed Systems (CS 345). An introduction to principles and main paradigms indistributed computing. New course model, developed during tenure as Searle Junior Fellow, combining traditional lecture-oriented and seminar-style approaches. Course includes a quarter-length, team-based project.

Internet-scale Experimentation (CS 445). A senior undergraduate and graduate course exploring the challenges with experimentation and measurement of Internet-scale systems.

Operating Systems (CS 343). Overview of operating systems concepts with a significant project component.

Advanced Operating Systems (CS 443). Seminar-style course based on article readings, in-class discussion, and a quarter-length project.

Distributed Systems in Challenging Environments (CS 395/495; senior undergraduate and graduate course). Seminar-style course that reviews interesting ideas and ongoing projects that are pushing distributed systems into new and challenging domains.

Peer-to-Peer Computing (MSIT-491; Master of Science in Information Technology Program). A short introductory course in peer-to-peer computing, its potential, limitations and implications.

TUTORIALS AND SHORT COURSES

"Experimentacion a escala Internet", presented at the 31st Escuela de Ciencias Informáticas, Universidad de Buenos Aires, Argentina, Julio 2017.

"Internet-Scale Experimentation", presented at the 6th PhD School on Traffic Monitoring and Analysis, associated with the 8th International Workshop on Traffic Monitoring and Analysis, Leuvain La Neuve, Belgium, April 2016.

"Sistemas Distribuidos de Gran Escala", a short course on large-scale distributed systems as part of the *Visiting Faculty Program* in the Department of Computer Science, Universidad de Buenos Aires, Argentina, June-July 2012.

CONSULTING

Advisory Board, DOSENSIO LLC (2008-2011).

Advisory Board, NEOKAST LLC, (2007-2009).

PROFESSIONAL ACTIVITIES

Affiliations

Affiliated Faculty, Northwestern Institute on Complex Systems (NICO), Northwestern U., 2014-Present.

Affiliated Faculty, Transportation Center, Northwestern U., 2006-Present.

Editorial, Advisory Boards and Steering Committees

Steering Committee, Passive and Active Measurement (PAM), 2019-Present.

Editorial Board, IEEE Internet Computing, 2012-Present.

Editorial Board, IEEE/ACM Transactions on Networking, 2014-2018.

Editorial Board, ACM SIGCOMM Computer Communications Review., 2013-2018.

Advisory Board, Northwestern Institute on Complex Systems (NICO), Northwestern U., 2018-Present.

Executive Committee, Northwestern Institute on Complex Systems (NICO), Northwestern U., 2015-2017.

Faculty Leader, Internet and Society Workgroup, Northwestern Institute on Complex Systems (NICO), Northwestern U., 2014-Present.

External Advisory Board, mPlane: Building an Intelligent Measurement plane for the Internet (`http://www.ict-mplane.eu`), 2013-2015.

Chair, Steering Committee, IEEE International Conference on Peer-to-Peer Computing (P2P), 2013-2015.

Steering Committee, Greater Chicago Area System Research Workshop (GCASR), 2012-2013.

Program Committee

USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2017, 2019, 2020.

Passive and Active Measurement (PAM), 2017, 2018, 2019, 2020, 2021.

ACM Internet Measurement Conference (IMC), 2011, 2015, 2016, 2018, 2021, 2022, 2024.

ACM International Conference on emerging Networking EXperiments and Technologies (CoNEXT), 2013, 2015, 2018, 2019, 2024.

ACM SIGCOMM 2020 Workshop on Network Application Integration/CoDesign, 2020.

ACM SIGCOMM, 2012, 2016, 2023.

ACM European Conference on Computer Systems (EuroSys), 2014, 2018.

IEEE INFOCOM, Demo/Poster Session, 2013, 2014.

International Conference on Communication Systems and Networks (COMSNETS), 2009, 2010, 2014.

IEEE Internet Conference on Network Protocols (ICNP), 2012.

ACM SIGCOMM Workshop on Measurements Up and Down the STack (W-MUST), 2012.

ACM SIGCOMM Workshop on Home Networks (HomeNets) 2011, 2012.

ACM SIGCOMM Poster/Demos 2011, 2012, 2013.

International ACM Symposium on High Performance Distributed Computing (HPDC), 2010.

IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS), 2008, 2009.

ACM International Workshop on Vehicular Inter-Networking (VANET), 2008, 2009.

IEEE International Conference on Pervasive Computing and Communications (PerCom), 2009.

International World Wide Web Conference (WWW), 2006, 2009, 2010.

IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO), 2008.

International Workshop on Peer-to-Peer Systems (IPTPS), 2008.

International Workshop on Wireless Mesh and Ad hoc Networks (WiMAN), 2008.

First International Workshop on Pervasive Transportation Systems (PerTrans), 2007.

IEEE International Conference on Distributed Computing Systems (ICDCS), 2006, 2007, 2008, 2013, 2014.

IEEE International Conference on Autonomic Computing (ICAC), 2005, 2006, 2007, 2008, 2009, 2010, 2011.

International Conference on Computer Communications and Networks (ICCCN), 2006, 2007.

International Conference on Self-Organization and Autonomic systems in Computing and Communication (SOAS), 2006, 2007.

International Conference on High Performance Computing and Communications (HPCC), 2005, 2006, 2007.

IEEE Conference on Peer-to-Peer Computing (P2P), 2006, 2007, 2008, 2009, 2013.

International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MOBIQUITOUS), 2007.

International Workshop on Quality of Service (IWQoS), 2007.

IEEE Percom Workshop on Pervasive Transportation Systems (PerTran), 2007.

International Conference on Autonomic and Trusted Computing (ATC), 2006.

Adaptive Grid Computing Workshop, part of IEEE International Symposium on Network Computing and Applications, 2006.

International Conference on Parallel Processing (ICPP), 2006.

International Conference on Parallel and Distributed Systems (ICPADS), 2006.

IADIS International Conference on Applied Computing, 2005.

ORGANIZATION

Co-organizer, NSF Workshop Towards Re-architecting Today's Internet for Survivability, 2023.

Steering Committee, NSF Workshop on Overcoming Measurement Barriers to Internet Research, 2021.

Technical Program Co-Chair (with Nick Feamster), ACM Internet Measurement Conference (IMC), 2020.

Co-Chair Student Workshop Co-Chair, ACM International Conference on emerging Networking EXperiments and Technologies (CoNEXT), 2020.

Co-chair, Passive and Active Measurement (PAM), 2019.

Co-chair, IEEE ICDCS 3rd Workshop on QoE-based Analysis and Management of Data Communication Networks, 2018.

Co-chair, ACM SIGCOMM Workshop on QoE-based Analysis and Management of Data Communication Networks (Internet-QoE), 2017.

Co-chair, Workshop on Distributed Computing: Mixing Systems and Theory, part of PODC 2016.

Co-chair, ACM SIGCOMM Workshop on QoE-based Analysis and Management of Data Communication Networks (Internet-QoE), 2016.

Co-chair, ACM SIGCOMM Workshop on Fostering Latin-American Research in Data Communication Networks (LANCOMM), 2016.

Co-chair, Greater Chicago Area Systems Research Workshop (GCASR), 2016.

Co-organizer, NSF/FCC Workshop on Tracking Quality of Experience in the Internet, 2015.

Co-founder, ACM SIGCOMM Workshop on Crowdsourcing and crowdsharing of Big (Internet) Data – C2B(I)D, 2015.

General Co-Chair, ACM SIGCOMM, 2014.

Panel co-chair, ACM COMSNETS 2014.

Technical Program Co-Chair, IEEE International Conference on Peer-to-Peer Computing (P2P), 2012.

Session chair, ACM SIGCOMM 2012.

Local Arrangements Chair, ACM/USENIX Internet Measurement Conference (IMC), 2009.

General Chair, IEEE Workshop on Hot Topics in Web Systems and Technologies (HotWeb), 2008.

Local Organizer, International Conference on Autonomic Computing (ICAC), 2008.

Co-Chair, Workshop on Hot Topics in Autonomic Computing (HotAC), 2006, 2007, 2008, 2009.

Co-Founder, Workshop on Hot Topics in Autonomic Computing (HotAC).

OTHER

Fellow, Public Voices - The OpEd Project, 2014.

Invited participant, Dagstuhl Seminar on "Global Measurement Framework," 2014.

Panelist, National Science Foundation, USA (several years since 2002).

Reviewer, Israel Science Foundation, Israel, 2019.

Reviewer, Research Grant Council, Hong Kong, China, 2019.

Reviewer, Austrian Science Fund (FWF), 2018.

Invited participant, Computing Community Consortium Leadership in Science Policy Institute (LiSPI), November 2011.

Panelist, Portuguese Foundação para Ciência e a Tecnologia (Foundation for Science and Technology), Portugal, 2009.

USENIX/SAGE University Representative for Northwestern U. (2004–Present).

Referee for several journals including *ACM Transaction on Computer Systems, IEEE/ACM Transactions on Networking, IEEE Computer, IEEE Journal on Selected Areas in Communication, IEEE Journal, IEEE Transactions on Parallel and Distributed Systems, IEEE Multimedia, IEEE Transactions on Software Engineering, Elsevier Journal of Parallel and Distributed Computing,* and *Software Practice and Experience.*

Senior member of the ACM; Senior Member of IEEE and the IEEE Computer Society; member of USENIX and the Society of Hispanic Professional Engineers (SHPE).

DEPARTMENTAL AND UNIVERSITY ACTIVITIES

Director of Graduate Admissions, 2018-2023.

Strategy & Planning Committee, Computer Science, 2015-2023.

Associate Head, Computer Science, 2015-2019.

Departmental Computer Systems and Infrastructure Committee, EECS, Northwestern U., Member 2002-2010, Chair 2010-2019.

School Research Computing Committee, McCormick School of Engineering and Applied Science, Northwestern U., 2011-Present.

School Undergraduate Advisor, McCormick School of Engineering and Applied Science, Northwestern U., 2003-Present.

Promotion and Tenure, McCormick School of Engineering and Applied Sciences, 2015-2017, 2021-2023.

Moderator, Autonomous Vehicle Technology for Passenger and Freight, Northwestern University Transportation Center, Spring 2014.

Departmental Diversity Committee, EECS, 2013-2018.

University Collaborative Service Faculty Working Group, Northwestern U., 2011-2012.

Departmental Restructuring Committee, EECS, Chair 2011.

Departmental Computer Science Undergraduate Curriculum Committee, EECS, Northwestern U., 2010-Present.

Departmental Committee on Mission and Goals, EECS, Northwestern U., 2009-2010.

Departmental Publicity, Alumni and Industrial Relations Committee, EECS, Northwestern U., Member 2006-2008, Chair 2008-2011.

Computer Systems and Infrastructure Committee, EECS, Northwestern U., 2002-2010.

Departmental Undergraduate Recruiting, EECS, Northwestern U., 2006-2011.

Invited Panelist, Workshop for Industrial Funded Research, McCormick School of Engineering and Applied Science, Northwestern U., 2006.

Departmental Web-Site Re-Design Committee, Department of Computer Science, Northwestern U., 2002-2003, 2005-2006.

Department Chair's Advisory Committee, Department of Computer Science, Northwestern U., 2003-2004.

Departmental Colloquia Chair, Department of Computer Science, Northwestern U., 2003-2004.

Departmental Curriculum Committee, Department of Computer Science, Northwestern U., 2002-2003.

School Member of Web Redesign Committee, McCormick School of Engineering and Applied Science, Northwestern U., 2003-2004.

Co-founder of the Northwestern Systems Research Group, Department of Computer Science, Northwestern U., 2002.

Initiator and coordinator of the Systems Reading Group, College of Computing, Georgia Institute of Technology, 1998-2002.

Lab Coordinator for Systems Research Group, College of Computing, Georgia Institute of Technology, 1997-2002.

Member of the Graduate Student Council, College of Computing, Georgia Institute of Technology, 1996-1999.

Founder and president of the Computer Science Student Center, Universidad Nacional de la Patagonia San Juan Bosco, 1986.

RECENT INVITED LECTURES

October 2023 – "Weighting the criticality of the submarine cable network," Keynote at the Inaugural LACNIC Internet Measurement Working Group (IMWG), Fortaleza, Brazil.

March 2022 – "Networked Systems as Witnesses - Content Demand, Human Mobility and an Infection Spread," Northwestern Institute on Complex Systems (NICO), Evanston, IL.

March 2019 – "AMPlify the World," Keynote at the TMA Workshop, Puerto Varas, Chile.

June 2018 – "Network Research and Falling Trees," Keynote at the TMA Workshop, Vienna, Austria.

June 2018 – "Browsing Over Clouds – Characterizing and Improving the In-Flight Network Experience,", TMA Expert Summit, Vienna, Austria.

November 2016 – "The Experience Network," Telefonica Research, Barcelona, Spain.

October 2016 – "(The Importance of) Being Connected – On the reliability of broadband," Broadband Internet Technical Advisory Group (BITAG), Boulder, CO.

July 2015 – "Broadband reliability or the growing importance of being always on," Vrije U., Amsterdam, Netherlands.

December 2014 – "Broadband Service characterization in a broader context," Chicago Chapter ACM and Loyola University, Chicago, IL.

November 2014 – "Broadband Service characterization in a broader context," University of British Columbia, Vancouver, Canada.

August 2014 – Invited Panelist, From Student to PI: Becoming An Independent Researcher, N2Women Workshop.

March 2014 – "Pushing Internet Experimentation to the (network) edge," John Hopkins University, Baltimore, MD.

November 2013 – "An Experimentation platform for the Internet's edge," Max Plank Institute, Saarbrücken, Germany

September 2013 - "Enabling experimentation at the Internet's edge", Trinity College, Dublin, Ireland.

August 2012, Invited Panelist, ACM SIGCOMM Workshop on Mobile Games (MobiGames).

November 2012, Invited speaker, Annual Meeting, Society of Hispanic Professional Engineers (SPHE).

August 2012, Invited Panelist, ACM SIGCOMM Workshop on Measurement Up and Down the STack (W-MUST).

September 2011 – "The State of Broadband - Getting a straight answer", Science Cafe, Evanston, IL.

April 2011 – "Crowdsourcing Broadband Service Characterization to the Network Edge," UIUC, Urbana-Champaign, IL.

April 2011 – "Crowdsourcing Broadband Service Characterization to the Network Edge," DePaul U., Chicago, IL.

February 2011 – "Crowdsourcing ISP Characterization to The Network Edge," CAIDA AIMS Workshop, San Diego, CA.

October 2010 – "Crowdsourcing Service-Level Network Event Monitoring," HP Labs, Palo Alto, CA.

2009, Invited participant, NSF Future Internet Architecture Summit.

July 2009 – "Crowdsourcing Network Monitoring," University of Cambridge, Cambridge, UK.

February 2009 – "Vehicular-Based Monitoring for Sustainable Urban Growth," Trinity College, Dublin, Ireland.

October 2008 – "Tension between P2P communication and service providers," International Conference on Network Protocols (ICNP), Invited panelist.

September 2008 – "Taming the Torrent – *Can't ISPs and P2P just get along?*," U. of Wisconsin-Madison.

June 2008 – "Taming the Torrent – *Can't ISPs and P2P just get along?*," IBM Research, Watson, NY.

June 2008 – "Taming the Torrent – *Can't ISPs and P2P just get along?*," AT&T Research, Florham Park, NJ.

October 2007 – "Distributed Systems on Vehicular Networks – Challenges and Opportunities," U. of Illinois, Chicago – Computational Transportation Science.

May 2007 – "3R: Ensuring Sustainable scalability for globally-distributed systems," University of Maryland, College Park.

April 2007 – "3R: Ensuring Sustainable scalability in globally-distributed systems," Boston University.

March 2007 – "3R: Ensuring Sustainable scalability in globally-distributed systems," U. of Illinois at Urbana-Champaign.

February 2007 – "3R: Ensuring Sustainable scalability in globally-distributed systems," Hewlett-Packard Research Lab, Palo Alto, CA.

November 2006 – "Sustainable scalability in globally-distributed systems," Purdue University.

October 2006 – "Sustainable scalability in globally-distributed systems," U. of Minnesota, Twin Cities.

August 2006 – "Sustainable scalability in large-scale distributed systems," U. of Notre Dame.

June 2006 – "Sustainable scalability in large-scale distributed systems," Trinity College, Dublin, Ireland.

February 2006 – "Sustainable scalability in cooperative distributed systems," IBM Research, Watson, NY.

COLLABORATORS

Yan Chen, Aleksandar Kuzmanovic, Michael Rubenstein (Northwestern U.), Paul Barford (U. Wisconsin-Madison), Hamed Haddadi (Imperial College London), Nick Feamster (U. of Chicago), Pedro Casas (AIT), Andra Lutu (Telefonica), Diego Perino (Telefonica), Walter Willinger (Niksun), Narseo Vallina-Rodriguez (ICSI — IMDEA), Matteo Varvello (Bell Labs), Romain Fontugne (IIJ), Ben Greenstein (Google), Ian Clelland (Google), Marcelo Bangulo (U Carlos III Madrid).

PERSONAL INFORMATION

Naturalized USA citizen; Argentinian.

Married to Dr. Jeanine M. Casler; two children (Luca and Sofia).

Fluent in English and Spanish. Reading knowledge of Italian and Portuguese.

Long-distance runner (ultra-marathons, marathons, half-marathons, 10K, and 5K); rugby player for Chenque Rugby Club (1984–1993).