Alex C. Snoeren

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Employment summary

University of California, San Diego

2012–	Professor in the Department of Computer Science and Engineering
2008–12	Associate Professor in the Department of Computer Science and Engineering
2002–8	Assistant Professor in the Department of Computer Science and Engineering

Georgia Institute of Technology

2011–12	Visiting Associate Professor in the School of Computer Science

BBN Technologies

1999–2002	Research scientist in the Internetworking Research department

Hewlett-Packard Research Labs

1995–7	Research intern in the Performance, Management & Design group of the Software Technology lab

Education

Massachusetts Institute of Technology

2003	PhD in Electrical Engineering and Computer Science
A Session-Based Architecture for Internet Mobility, Hari Balakrishnan and M. Frans Kaashoek, advisors

Georgia Institute of Technology

1997	MS in Computer Science
BS in Applied Mathematics (*with highest honors*)
1996	BS in Computer Science (*with highest honors*)

Awards

2020	IEEE Fellow
2018	ACM Fellow
2018	Best Paper Award, ACM SIGCOMM
2017	Facebook Faculty Research Award
2009	Alfred P. Sloan Fellow
2008	Jay Lepreau Best Paper Award, USENIX OSDI
2001, 7	Best Student Paper Award, ACM SIGCOMM
2004	NSF CAREER Award
	George M. Sprowls Thesis Award, MIT EECS Department *(Honorable Mention)*
1996	Outstanding Undergraduate, Georgia Institute of Technology College of Computing

Book chapters; journal and magazine articles

1. "RIPE IPmap Active Geolocation: Mechanism and Performance Evaluation." Ben Du, Massimo Candela, Bradley Huffaker, Alex C. Snoeren, and kc claffy. *ACM SIGCOMM Computer Communications Review* (CCR), Volume 50, Number 1, April 2020.

2. "Understanding the Limits of Passive Realtime Datacenter Fault Detection and Localization." Arjun Roy, Rajdeep Das, Hongyi Zeng, Jasmeet Bagga, and Alex C. Snoeren. *IEEE/ACM Transactions on Networking* (TON), Volume 27, Number 5, October 2019.

3. "Passive Realtime Datacenter Fault Detection and Localization." Arjun Roy, Hongyi Zeng, Jasmeet Bagga, and Alex C. Snoeren. *USENIX ;login:* Volume 42, Number 3, Fall 2017.

4. "Lost in Space: Improving Inference of IPv4 Address Space Utilization." Alberto Dainotti, Karyn Benson, Alistair King, Bradley Huffaker, Eduard Glatz, Xenofontas Dimitropoulos, Philipp Richter, Alessandro Finamore, and Alex C. Snoeren. *IEEE Journal on Selected Areas in Communication* (JSAC), Volume 34, Number 6, June 2016.

5. "Enfold: Downclocking OFDM in Wi-Fi." Feng Lu, Patrick Ling, Geoffrey M. Voelker, and Alex C. Snoeren. *GetMobile: Mobile Computing and Communications* (MC²R), Volume 19, Number 2, April 2015.

6. "Achieving Congestion Diversity in Multi-hop Wireless Mesh Networks." Abhijeet A. Bhorkar, Tara Javidi, and Alex C. Snoeren. *IEEE Transactions on Mobile Computing* (TMC), Volume 14, Number 3, March 2015.

7. "Managing Contention with Medley." Feng Lu, Geoffrey M. Voelker, and Alex C. Snoeren. *IEEE Transactions on Mobile Computing* (TMC), Volume 14, Number 3, March 2015.

8. "Router Support for Fine-Grain Latency Measurements." Ramana Rao Kompella, Kirill Levchenko, Alex C. Snoeren, and George Varghese. *IEEE/ACM Transactions on Networking* (TON), Volume 20, Number 3, June 2012.

9. "Distributed Application Configuration, Management, and Visualization with Plush." Jeannie Albrecht, Christopher Tuttle, Ryan Braud, Darren Dao, Nikolay Topilski, Alex C. Snoeren, and Amin Vahdat. *ACM Transactions on Internet Technology* (TOIT), Volume 11, Number 2, December 2011.

10. "DieCast: Testing Distributed Systems with an Accurate Scale Model." Diwaker Gupta, Kashi V. Vishwanath, Marvin McNett, Amin Vahdat, Ken Yocum, Alex C. Snoeren, and Geoffrey M. Voelker. *ACM Transactions on Computer Systems* (TOCS), Volume 29, Number 2, May 2011.

11. "Privacy-Preserving Network Forensics." Mikhail Afanasyev, Tadayoshi Kohno, Justin Ma, Nick Murphy, Stefan Savage, Alex C. Snoeren, and Geoffrey M. Voelker. *Communications of the ACM* (CACM), Volume 54, Number 5, May 2011.

12. "Fault Localization via Risk Modeling," Ramana Rao Kompella, Jennifer Yates, Albert Greenberg, and Alex C. Snoeren. *IEEE Transactions on Dependable and Secure Computing* (TDSC), Volume 7, Number 4, October–December 2010.

13. "Usage Patterns in an Urban WiFi Network," Mikhail Afanasyev, Tsuwei Chen, Geoffrey M. Voelker, and Alex. C. Snoeren. *IEEE/ACM Transactions on Networking* (TON), Volume 18, Number 5, October 2010.

14. "Difference Engine: Harnessing Memory Redundancy in Virtual Machines." Diwaker Gupta, Sangmin Lee, Michael Vrable, Stefan Savage, Alex C. Snoeren, George Varghese, Geoffrey M. Voelker, and Amin Vahdat. *Communications of the ACM* (CACM), Volume 53, Number 10, October 2010.

15. "Covenant: An Architecture for Cooperative Scheduling in 802.11 Wireless Networks," Ishwar Ramani, Ramana Rao Kompella, Sriram Ramabhadran, and Alex C. Snoeren. *IEEE Transactions on Wireless Communications* (TWC), Volume 9, Number 1, January 2010.

16. "Two Auction-Based Resource Allocation Environments: Design and Experience." Alvin AuYoung, Phil Buonadonna, Brent N. Chun, Chaki Ng, David C. Parkes, Jeff Shneidman, Alex C. Snoeren, and Amin Vahdat. In *Market Oriented Grid and Utility Computing*, Rajkumar Buyya and Kris Bubendorfer, Eds., Wiley, November 2009. pp. 513–539.

17. "Secure and Policy-Compliant Source Routing." Barath Raghavan, Patrick Verkaik, and Alex C. Snoeren. *IEEE/ACM Transactions on Networking* (TON), Volume 17, Number 3, June 2009.

18. "Difference Engine: Harnessing Memory Redundancy in Virtual Machines." Diwaker Gupta, Sangmin Lee, Michael Vrable, Stefan Savage, Alex C. Snoeren, George Varghese, Geoffrey M. Voelker, and Amin Vahdat. *USENIX ;login:* Volume 34, Number 2, April 2009.

19. "Managing Distributed Applications with Plush." Jeannie Albrecht, Ryan Braud, Darren Dao, Nikolay Topilski, Christopher Tuttle, Alex C. Snoeren, and Amin Vahdat. *USENIX ;login:* Volume 33, Number 1, February 2008.

20. "High Bandwidth Data Dissemination for Large-scale Distributed Systems." Dejan Kostić, Alex C. Snoeren, Amin Vahdat, Ryan Braud, Charles Killian, Jeannie Albrecht, James W. Anderson, Adolfo Rodriguez, and Erik VandeKieft. *ACM Transactions on Computer Systems* (TOCS), Volume 26, Number 1, February 2008.

21. "PlanetLab Application Management using Plush." Jeannie Albrecht, Christopher Tuttle, Alex C. Snoeren, and Amin Vahdat. *ACM Operating Systems Review* (OSR), Volume 40, Number 1, January 2006.

22. "Single-Packet IP Traceback." Alex C. Snoeren, Craig Partridge, Luis A. Sanchez, Christine E. Jones, Fabrice Tchakountio, Beverly Schwartz, Stephen T. Kent, and W. Timothy Strayer. *IEEE/ACM Transactions on Networking* (TON), Volume 10, Number 6, December 2002.

23. "FIRE: Flexible Intra-AS Routing Environment." Craig Partridge, Alex C. Snoeren, W. Timothy Strayer, Beverly Schwartz, Matthew Condell, and Isidro Castineyra. *IEEE Journal on Selected Areas in Communications* (JSAC), Volume 19, Number 3, March 2001.

Conference publications

24. "SmartNIC Performance Isolation with FairNIC: Programmable Networking for the Cloud." Stewart Grant, Anil Yelam, Maxwell Bland, and Alex C. Snoeren. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), New York, NY, August 2020. (44/250 21.6% acceptance)

25. "Corundum: An Open-Source 100G NIC." Alex Forencich, Alex C. Snoeren, George Porter, and George Papen. *Proceedings of the 28th IEEE International Symposium On Field-Programmable Custom Computing Machines* (FCCM), Fayetteville, AR, May 2020.

26. "Adapting TCP for Reconfigurable Datacenter Networks." Matthew Mukerjee, Christopher Canel, Weiyang Wang, Daehyeok Kim, Srinivasan Seshan, and Alex C. Snoeren. *Proceedings of the 17th ACM/USENIX Symposium on Networked Systems Design and Implementation* (NSDI), Santa Clara, CA, February 2020. (48/275 17.5%)

27. "Expanding Across Time to Deliver Bandwidth Efficiency and Low Latency." William M. Mellette, Rajdeep Das, Yibo Guo, Rob McGuinness, Alex C. Snoeren, and George Porter. *Proceedings of the 17th ACM/USENIX Symposium on Networked Systems Design and Implementation* (NSDI), Santa Clara, CA, February 2020. (17/79 21.5%)

28. "SparSDR: Sparsity-proportional Wideband SDRs." Moein Khazraee, Yeswanth Guddeti, Sam Crow, Alex C. Snoeren, Kirill Levchenko, Dinesh Bharadia, and Aaron Schulman. *Proceedings of the ACM Conference on Mobile Systems, Appliations and Services* (MobiSys), Seoul, Korea, June 2019. (40/172 23.3%)

29. "An Empirical Analysis of the Commercial VPN Ecosystem." Mohammad Taha Khan, Joe DeBlasio, Chris Kanich, Geoffrey M. Voelker, Alex C. Snoeren, and Narseo Vallina-Rodriguez. *Proceedings of the ACM Internet Measurement Conference* (IMC), Boston, Massachusetts, October 2018. (43/174 24.7%)

30. "Inferring Persistent Interdomain Congestion." Amogh Dhamdhere, David D. Clark, Alexander Gamero-Garrido, Matthew Luckie, Ricky K. P. Mok, Gautam Akiwate, Kabir Gogia, Vaibhav Bajpai, Alex C. Snoeren, and kc claffy. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Budapest, Hungary, August 2018. (40/222 18.0%) **Best paper.**

31. "Tracking Ransomware End-to-end." Danny Yuxing Huang, Maxwell Matthaios Aliapoulios, Vector Guo Li, Luca Invernizzi, Elie Bursztein, Kylie McRoberts, Jonathan Levin, Kirill Levchenko, Alex C. Snoeren, and Damon McCoy. *Proceedings of the IEEE Symposium on Security and Privacy* (OAKLAND), San Francisco, California, May 2018. (49/549 8.9%)

32. "Quantifying the Pressure of Legal Risks on Third-party Vulnerability Research." Alex Gamero-Garrido, Stefan Savage, Kirill Levchenko, and Alex C. Snoeren. *Proceedings of the ACM Conference on Computer and Communications Security* (CCS), Dallas, Texas, November 2017. (151/843 17.9%)

33. "Tripwire: Inferring Internet Site Compromise." Joe DeBlasio, Stefan Savage, Geoffrey M. Voelker, and Alex C. Snoeren. *Proceedings of the ACM Internet Measurement Conference* (IMC), London, England, November 2017. (42/179 23.5%)

34. "Exploring the Dynamics of Search Advertiser Fraud." Joe DeBlasio, Saikat Guha, Geoffrey M. Voelker and Alex C. Snoeren. *Proceedings of the ACM Internet Measurement Conference* (IMC), London, England, November 2017. (42/179 23.5%)

35. "RotorNet: A Scalable, Low-complexity, Optical Datacenter Network." William M. Mellette, Rob McGuinness, Arjun Roy, Alex Forencich, George Papen, Alex C. Snoeren, and George Porter. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Los Angeles, California, August 2017. (36/250 14.4%)

36. "Using Indirect Routing to Recover from Network Traffic Scheduling Estimation Error." Conglong Li, Matthew Mukerjee, David G. Andersen, Srinivasan Seshan, Michael Kaminsky, George Porter, and Alex C. Snoeren. *Proceedings of the ACM/IEEE Symposium on Architectures for Networking and Communications Systems* (ANCS), Beijing, China, May 2017. (15/55 27.3%)

37. "Pinning Down Abuse on Google Maps." Danny Yuxing Huang, Doug Grundman, Kurt Thomas, Elie Bursztein, Abhishek Kumar, Kirill Levchenko, and Alex C. Snoeren. *Proceedings of the International World Wide Web Conference* (WWW), Perth, Australia, April 2017. (164/966 17.0%)

38. "Passive Realtime Datacenter Fault Detection and Localization." Arjun Roy, Hongyi Zeng, Jasmeet Bagga, and Alex C. Snoeren. *Proceedings of the 14th ACM/USENIX Symposium on Networked Systems Design and Implementation* (NSDI), Boston, MA, March 2017. (46/253 18.2%)

39. "Scheduling Techniques for Hybrid Circuit/Packet Networks." He Liu, Matthew K. Mukerjee, Conglong Li, Nicolas Feltman, George Papen, Stefan Savage, Srinivasan Seshan, Geoffrey M. Voelker, David G. Andersen, Michael Kaminsky, George Porter, and Alex C. Snoeren. *Proceedings of the ACM Conference on emerging Networking EXperiments and Technologies* (CoNEXT), Heidelberg, Germany, December 2015. (41/196 20.9%)

40. "Empirical Analysis of Search Advertising Strategies." Bhanu C. Vattikonda, Vacha Dave, Saikat Guha, and Alex C. Snoeren. *Proceedings of the ACM Internet Measurement Conference* (IMC), Tokyo, Japan, October 2015. (44/169 26%)

41. "Revisiting Internet Background Radiation for Opportunistic Network Analysis." Karyn Benson, Alberto Dainotti, kc claffy, Alex C. Snoeren, and Michael Kallitsis. *Proceedings of the ACM Internet Measurement Conference* (IMC), Tokyo, Japan, October 2015. (44/169 26%)

42. "Security by Any Other Name: On the Effectiveness of Provider Based Email Security." Ian Foster, Jon Larson, Max Masich, Alex C. Snoeren, Stefan Savage, and Kirill Levchenko. *Proceedings of the ACM Conference on Computer and Communications Security* (CCS), Denver, Colorado, October 2015. (128/646 19.8%)

43. "Inside the Social Network's (Datacenter) Network." Arjun Roy, Hongyi Zeng, Jasmeet Bagga, George Porter, and Alex C. Snoeren. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), London, England, August 2015. (40/256 15.6%)

44. "Interpreting Advertiser Intent in Sponsored Search." Bhanu C. Vattikonda, Santhosh Kodipaka, Hongyan Zhou, Vacha Dave, Saikat Guha, and Alex C. Snoeren. *Proceedings of the ACM SIGKDD Conference* (KDD), Sydney, Australia, August 2015. (64/187 34.2%)

45. "Deniable Liaisons." Ahbinav Narain, Nick Feamster, and Alex C. Snoeren. *Proceedings of the ACM Conference on Computer and Communications Security* (CCS), Scottsdale, Arizona, November 2014. (114/585 19.5%)

46. "On the Security of Mobile Cockpit Information Systems." Devin Lundberg, Brown Fairnholt, Edward Sullivan, Ryan Mast, Stephen Checkoway, Stefan Savage, Alex C. Snoeren, and Kirill Levchenko. *Proceedings of the ACM Conference on Computer and Communications Security* (CCS), Scottsdale, Arizona, November 2014. (114/585 19.5%)

47. "Blender: Upgrading Tenant-based Data Center Networking." Kevin C. Webb, Arjun Roy, Kenneth Yocum, and Alex C. Snoeren. *Proceedings of the ACM/IEEE Symposium on Architectures for Networking and Communications Systems* (ANCS), Marina del Rey, California, October 2014. (19/56 33.9%)

48. "Enfold: Downclocking OFDM in WiFi." Feng Lu, Patrick Ling, Geoffrey M. Voelker, and Alex C. Snoeren. *Proceedings of the Annual International Conference on Mobile Computing and Networking* (MoBiCom), Maui, Hawaii, September 2014. (36/220 16.4%)

49. "Circuit Switching Under the Radar with REACToR." He Liu, Feng Lu, Alex Forencich, Rishi Kapoor, Malveeka Tewari, Geoffrey M. Voelker, George Papen, Alex C. Snoeren, and George Porter. *Proceedings of the ACM/USENIX Symposium on Networked Systems Design and Implementation* (NSDI), Seattle, WA, April 2014. (38/213 17.8%)

50. "Exposing Inconsistent Web Search Results with Bobble." Xinyu Xing, Wei Meng, Dan Doozan, Nick Feamster, Wenke Lee, and Alex C. Snoeren. *Proceedings of the Passive and Active Measurements Conference* (PAM), Los Angeles, CA, March 2014. (24/76 31.6%)

51. "Botcoin: Monetizing Stolen Cycles." Danny Yuxing Huang, Hitesh Dharmdasani, Sarah Meiklejohn, Vacha Dave, Chris Grier, Damon McCoy, Stefan Savage, Nicholas Weaver, Alex C. Snoeren, and Kirill Levchenko. *Proceedings of the Network and Distributed System Security Symposium* (NDSS), San Diego, CA, February 2014. (55/293 18.8%)

52. "Take This Personally: Pollution Attacks on Personalized Services." Xinyu Xing, Wei Ming, Dan Doozan, Alex C. Snoeren, Nick Feamster, and Wenke Lee. *Proceedings of the USENIX Security Symposium*, Washington D.C., August 2013. (45/277 16.2%)

53. "Quantifying the Benefits of Joint Content and Network Routing." Vytautas Valancius, Bharath Ravi, Nick Feamster, and Alex C. Snoeren. *Proceedings of ACM SIGMETRICS*, Pittsburgh, Pennsylvania, June 2013. (27/196 13.8%)

54. "SloMo: Downclocking WiFi Communication." Feng Lu, Geoffrey M. Voelker, and Alex C. Snoeren. *Proceedings of the 10th USENIX Symposium on Networked Systems Design & Implementation* (NSDI), Lombard, Illinois, April 2013. (38/171 22.2%)

55. "Practical TDMA for Datacenter Ethernet." Bhanu Vattikonda, George Porter, Amin Vahdat, and Alex C. Snoeren. *Proceedings of the ACM European Conference on Computer Systems* (EuroSys), Bern, Switzerland, April 2012. (27/178 15.2%)

56. "*scc:* Cluster Storage Provisioning Informed by Application Characteristics and SLAs." Harsha V. Madhyastha, John C. McCullough, George Porter, Rishi Kapoor, Stefan Savage, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the USENIX Conference on File and Storage Technologies* (FAST), San Jose, California, February 2012. (26/137 19.0%)

57. "On the Empirical Performance of Self-calibrating WiFi Location Systems." Daniel J. Turner, Stefan Savage, and Alex C. Snoeren. *Proceedings of the IEEE Conference on Local Computer Networks* (LCN), Bonn, Germany, October 2011. (50/181 27.6%)

58. "Evaluating the Effectiveness of Model-Based Power Characterization." John McCullough, Yuvraj Agarwal, Jaideep Chandrashekhar, Sathyanarayan Kuppuswamy, Alex C. Snoeren, and Rajesh Gupta, *Proceedings of the USENIX Annual Technical Conference*, Portland, Oregon, June 2011. (27/180 15.0%)

59. "California Fault Lines: Understanding the Causes and Impact of Network Failures." Daniel Turner, Kirill Levchenko, Alex C. Snoeren, and Stefan Savage, *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), New Delhi, India, August 2010. (33/276 12.0%)

60. "Stout: An Adaptive Interface to Scalable Cloud Storage." John C. McCullough, John Dunagan, Alec Wolman, and Alex C. Snoeren, *Proceedings of the USENIX Annual Technical Conference*, Boston, Massachusetts, June 2010. (24/141 17.0%)

61. "Neon: System Support for Derived Data Management." Qing Zhang, John McCullough, Justin Ma, Nabil Schear, Michael Vrable, Amin Vahdat, Alex C. Snoeren, Geoffrey M. Voelker, and Stefan Savage, *Proceedings of the ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments* (VEE), Pittsburgh, Pennsylvania, March 2010. (14/51 27.5%)

62. "The Importance of Being Overheard: Throughput Gains in Wireless Mesh Networks." Mikhail Afanasyev and Alex C. Snoeren. *Proceedings of the ACM/USENIX Internet Measurement Conference* (IMC), Chicago, Illinois, November 2009. (41/183 22.4%)

63. "Evaluating the Impact of Inaccurate Information in Utility-Based Scheduling." Alvin AuYoung, Amin Vahdat, and Alex C. Snoeren. *Proceedings of the ACM Conference on High Performance Computing and Networking* (SC), Portland, Oregon, November 2009. (59/261 22.6%)

64. "Every Microsecond Counts: Tracking Fine-Grain Latencies with a Lossy Difference Aggregator." Ramana Rao Kompella, Kirill Levchenko, Alex C. Snoeren, and George Varghese. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Barcelona, Spain, August 2009. (27/270 10%)

65. "Softspeak: Making VoIP Play Well in Existing 802.11 Deployments." Patrick Verkaik, Yuvraj Agarwal, Rajesh Gupta, and Alex C. Snoeren. *Proceedings of the USENIX Symposium on Networked Systems Design & Implementation* (NSDI), Boston, Massachusetts, April 2009. (31/163 19%)

66. "Difference Engine: Harnessing Memory Redundancy in Virtual Machines." Diwaker Gupta, Sangmin Lee, Michael Vrable, Stefan Savage, Alex C. Snoeren, George Varghese, Geoffrey M. Voelker, and Amin Vahdat. *Proceedings of the ACM/USENIX Symposium on Operating System Design & Implementation* (OSDI), San Diego, California, December 2008. (26/193 13.5%) **Best paper.**

67. "Analysis of a Mixed-Use Urban WiFi Network: When Metropolitan becomes Neapolitan." Mikhail Afanasyev, Tsuwei Chen, Geoffrey M. Voelker, and Alex C. Snoeren. *Proceedings of the 6th ACM/USENIX Internet Measurement Conference* (IMC), Vouliagmeni, Greece, October 2008. (32/185 17.3%)

68. "Efficiency through Eavesdropping: Link-layer Packet Caching." Mikhail Afanasyev, David G. Andersen, and Alex C. Snoeren. *Proceedings of the USENIX Symposium on Networked Systems Design & Implementation* (NSDI), San Francisco, California, April 2008. (30/175 17.1%)

69. "Remote Control: Distributed Application Configuration, Management, and Visualization with Plush." Jeannie Albrecht, Ryan Braud, Darren Dao, Nikolay Topilski, Christopher Tuttle, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the 21st USENIX Large Installation System Administration Conference* (LISA), Dallas, Texas, November 2007.

70. "Cloud Control with Distributed Rate Limiting." Barath Raghavan, Kashi Vishwanath, Sriram Ramabhadran, Kenneth Yocum, and Alex C. Snoeren. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Kyoto, Japan, August 2007. (35/258 13.6%) **Best student paper.**

71. "Automating Cross-Layer Diagnosis of Enterprise Wireless Networks." Yu-Chung Cheng, Mikhail Afanasyev, Patrick Verkaik, Peter Benko, Jennifer Chiang, Alex C. Snoeren, Stefan Savage, and Geoffrey M. Voelker. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Kyoto, Japan, August 2007. (35/258 13.6%)

72. "Wresting Control from BGP: Scalable Fine-grained Route Control." Patrick Verkaik, Dan Pei, Tom Scholl, Aman Shaikh, Alex C. Snoeren, and Jacobus van der Merwe, *Proceedings of the USENIX Annual Technical Conference*, Santa Clara, California, June 2007. (24/102 23.5%)

73. "Detection and Localization of Network Black Holes." Ramana Rao Kompella, Jennifer Yates, Albert Greenberg, and Alex C. Snoeren. *Proceedings of the IEEE International Conference on Computer Communications* (INFOCOM), Anchorage, Alaska, May 2007. (252/1400 18%)

74. "A Performance Analysis of Indirect Routing." Joshua Opos, Sriram Rambhadaran, Andrew Terry, Joseph Pasquale, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the IEEE International Parallel & Distributed Processing Symposium* (IPDPS), Long Beach, California, March 2007. (109/419 26.0%)

75. "Jigsaw: Solving the Puzzle of Enterprise 802.11 Analysis." Yu-Chung Cheng, John Bellardo, Peter Benko, Alex C. Snoeren, Geoffrey M. Voelker, and Stefan Savage. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Pisa, Italy, September 2006. (37/298 12.4%)

76. "Loose Synchronization for Large-Scale Networked Systems." Jeannie Albrecht, Christopher Tuttle, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the USENIX Annual Technical Conference*, Boston, Massachusetts, June 2006. (21/153 13.7%)

77. "Service Placement in Shared Wide-Area Platforms." David Oppenheimer, Brent Chun, David Patterson, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the USENIX Annual Technical Conference*, Boston, Massachusetts, June 2006. (21/153 13.7%)

78. "To Infinity and Beyond: Time-Warped Network Emulation." Diwaker Gupta, Kenneth Yocum, Marvin McNett, Alex C. Snoeren, Amin Vahdat, and Geoffrey M. Voelker. *Proceedings of the USENIX Symposium on Networked Systems Design & Implementation* (NSDI), San Jose, California, May 2006. (28/110 25.5%)

79. "Scalability, Fidelity and Containment in the Potemkin Virtual Honeyfarm." Michael Vrable, Justin Ma, Jay Chen, David Moore, Erik VandeKieft, Alex C. Snoeren, Geoffrey M. Voelker, and Stefan Savage. *Proceedings of the ACM Symposium on Operating System Principles* (SOSP), Brighton, United Kingdom, October 2005. (20/155 12.9%)

80. "IP Fault Localization Via Risk Modeling." Ramana Rao Kompella, Jennifer Yates, Albert Greenberg, and Alex C. Snoeren. *Proceedings of the USENIX Symposium on Networked Systems Design & Implementation* (NSDI), Boston, Massachusetts, May 2005. (25/112 22.3%)

81. "Maintaining High-Bandwidth under Dynamic Network Conditions." Dejan Kostić, Ryan Braud, Charles Killian, Erik VandeKieft, James W. Anderson, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the USENIX Annual Technical Conference* (USENIX), Anaheim, California, April 2005. (24/118 20.3%)

82. "Routing in an Internet-Scale Network Emulator." Jay Chen, Diwaker Gupta, Kashi V. Vishwanath, Alex C. Snoeren and Amin Vahdat. *Proceedings of the IEEE/ACM International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems* (MASCOTS), Volendam, The Netherlands, October 2004. (67/172 40%)

83. "A System for Authenticated Policy-Compliant Routing." Barath Raghavan and Alex C. Snoeren. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Portland, Oregon, September 2004. (31/340 9.1%)

84. "Practical Lazy Scheduling in Wireless Sensor Networks." Ramana Rao Kompella and Alex C. Snoeren. *Proceedings of the 1st ACM Conference on Embedded Networked Sensor Systems* (SenSys), Los Angeles, California, November 2003. (24/135 17.8%)

85. "Best-Path vs. Multi-Path Overlay Routing." David G. Andersen, Alex C. Snoeren, and Hari Balakrishnan. *Proceedings of the 1st ACM/USENIX Internet Measurement Conference* (IMC), Miami, Florida, October 2003. (32/109 29.4%)

86. "Tesla: A Transparent, Extensible Session-Layer Architecture for End-to-end Network Services." Jon Salz, Alex C. Snoeren, and Hari Balakrishnan. *Proceedings of the USENIX Symposium on Internet Technologies and Systems* (USITS), Seattle, Washington, March 2003. (21/76 27.6%)

87. "Mesh-Based Content Routing using XML." Alex C. Snoeren, Kenneth Conley, and David K. Gifford. *Proceedings of the 18th ACM Symposium on Operating System Principles* (SOSP), Banff, Canada, October 2001. (17/85 20%)

88. "Hash-Based IP Traceback." Alex C. Snoeren, Craig Partridge, Luis A. Sanchez, Christine E. Jones, Fabrice Tchakountio, Stephen T. Kent, and W. Timothy Strayer. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), San Diego, California, August 2001. (23/203 11.3%) **Best student paper.**

89. "Hardware Support for a Hash-Based IP Traceback." Luis A. Sanchez, Walter C. Milliken, Alex C. Snoeren, Fabrice Tchakountio, Christine E. Jones, Stephen T. Kent, Craig Partridge, and W. Timothy Strayer. *Proceedings of the DARPA Information Survivability Conference and Exposition* (DISCEX), Anaheim, California, June 2001.

90. "Fine-Grained Failover Using Connection Migration." Alex C. Snoeren, David G. Andersen, and Hari Balakrishnan. *Proceedings of the USENIX Symposium on Internet Technologies and Systems* (USITS), San Francisco, California, March 2001. (19/70 27.1%)

91. "FIRE: Flexible Intra-AS Routing Environment." Craig Partridge, Alex C. Snoeren, W. Timothy Strayer, Beverly Schwartz, Matthew Condell, and Isidro Castineyra. *Proceedings of the ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication* (SIGCOMM), Stockholm, Sweden, August 2000. (26/238 10.9%)

92. "An End-to-End Approach to Host Mobility." Alex C. Snoeren and Hari Balakrishnan. *Proceedings of the Annual International Conference on Mobile Computing and Networking* (MobiCom), Boston, Massachusetts, August 2000. (28/226 12.3%)

93. "Adaptive Inverse Multiplexing for Wide-Area Wireless Networks." Alex C. Snoeren. *Proceedings of the IEEE Conference on Global Communications* (GlobeCom), *Global Internet Symposium*, Rio de Janeiro, Brazil, December 1999. (28/117 23.9%)

Refereed workshop & short conference papers

94. "Enabling Active Networking on RMT Hardware." Rajdeep Das and Alex C. Snoeren. *Proceedings of the ACM Workshop on Hot Topics in Networks* (HotNets), Chicago, IL, November 2020. (30/120 25%)

95. "Triton: A Software-Reconfigurable Federated Avionics Testbed." Sam Crow, Brown Farinholt, Brian Johannesmeyer, Karl Koscher, Stephen Checkoway, Stefan Savage, Aaron Schulman, Alex C. Snoeren, and Kirill Levchenko. *Proceedings of the USENIX Workshop on Cyber Security Experimentation and Test* (cset), Santa Clara, CA, August 2019. (19/61 31.1%)

96. "LEED: A Lightwave Energy-Efficient Datacenter." Y. Shaya Fainman, Joseph Ford, William M. Mellette, Shayan Mookherjea, George Porter, Alex C. Snoeren, George Papen, Saman Saeedi, John Cunningham, Ashok Krishnamoorthy, Michael Gehl, Christopher T. DeRose, Paul S. Davids, Douglas C. Trotter, Andrew L. Starbuck, Christina M. Dallo, Dana Hood, Andrew Pomerene, and Anthony Lentine. *Proceedings of the Optical Fiber Communications Conference and Exhibition* (ofc), San Diego, CA, March 2019.

97. "Cloud Datacenter SDN Monitoring: Experiences and Challenges." Arjun Roy, Deepak Bansal, David Brumley, Harish Kumar Chandrappa, Parag Sharma, Rishabh Tewari, Behnaz Arzani, and Alex C. Snoeren. *Proceedings of the ACM Internet Measurement Conference* (imc), Boston, Massachusetts, October 2018. (short paper) (43/174 24.7%)

98. "Measuring Profitability of Alternative Crypto-currencies." Danny Yuxing Huang, Kirill Levchenko, and Alex C. Snoeren. *Proceedings of the International Conference on Financial Cryptography and Data Security* (fc), Nieuwpoort, Curacao, February 2018. (short paper) (29/110 26.4%)

99. "P-FatTree: A Multi-channel Datacenter Network Topology." William M. Mellette, Alex C. Snoeren, and George Porter. *Proceedings of the ACM Workshop on Hot Topics in Networks* (HotNets), Atlanta, GA, November 2016. (30/108 27.8%)

100. "CQIC: Revisiting Cross-Layer Congestion Control for Cellular Networks." Feng Lu, Hao Du, Ankur Jain, Geoffrey M. Voelker, Alex C. Snoeren, and Andreas Terzis. *Proceedings of the ACM International Workshop on Mobile Computing Systems and Applications* (HotMobile), Sante Fe, NM, February 2015. (23/80 28.8%)

101. "Bullet Trains: A Study of NIC Burst Behavior at Microsecond Timescales." Rishi Kapoor, Alex C. Snoeren, Geoffrey M. Voelker, and George Porter. *Proceedings of the ACM International Conference on Emerging Networking Experiments and Technologies* (CoNEXT), Santa Barbara, California, December 2013. (short paper) (15/83 18.1%)

102. "Scalable Coordination of a Tightly-Coupled Service in the Wide Area." Kevin C. Webb, Bhanu C. Vattikonda, Kenneth Yocum, and Alex C. Snoeren. *Proceedings of the ACM Conference on Timely Results in Operating Systems* (trios), Farmington, Pennsylvania, November 2013. (10/17 58.8%)

103. "A Comparison of Syslog and IS-IS for Monitoring Link State." Daniel Turner, Kirill Levchenko, Stefan Savage, and Alex C. Snoeren. *Proceedings of the ACM/USENIX Internet Measurement Conference* (imc), Barcelona, Spain, October 2013. (short paper) (42/178 23.6%)

104. "High-Fidelity Switch Models for Software-Defined Network Emulation." Danny Yuxing Huang, Ken Yocum, and Alex C. Snoeren. *Proceedings of the ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking* (HotSDN), Hong Kong, China, August 2013. (24/84 28.6%)

105. "Challenges in the Emulation of Large Scale Software Defined Networks." Arjun Roy, Kenneth Yocum, and Alex C. Snoeren. *Proceedings of the Asia-Pacific Workshop on Systems* (APSys), Singapore, July 2013. (20/73 27.4%)

106. "Weighted Fair Queuing with Differential Dropping." Feng Lu, Geoffrey M. Voelker, and Alex C. Snoeren. *Proceedings of the IEEE INFOCOM Mini-Conference*, Orlando, Florida, March 2012. (395/1578 25.0%)

107. "Achieving Congestion Diversity in Wireless Ad-hoc Networks." Abhijeet A. Bhorkar, Tara Javidi, and Alex C. Snoeren. *Proceedings of the IEEE INFOCOM Mini-Conference*, Shanghai, China, April 2011. (427/1823 23.4%)

108. "Topology Switching for Data Center Networks." Kevin Webb, Alex C. Snoeren, and Kenneth Yocum. *Proceedings of the USENIX Workshop on Hot Topics in Management of Internet, Cloud, and Enterprise Networks and Services* (HotICE), Boston, Massachusetts, March 2011. (14/26 54%)

109. "mPlane: An Architecture For Scalable Fault Localization." Ramana Rao Kompella, Alex C. Snoeren, and George Varghese. *Proceedings of the ACM CoNext Workshop on Re-Architecting the Internet* (ReArch), Rome, Italy, December 2009. (13/48 27.1%)

110. "Enlisting ISPs to Improve Online Privacy: IP Address Mixing by Default." Barath Raghavan, Tadayoshi Kohno, Alex C. Snoeren, and David Wetherall. *Proceedings of the Privacy Enhancing Technology Symposium* (PETS), Seattle, Washington, August 2009.

111. "Decongestion Control." Barath Raghavan and Alex C. Snoeren. *Proceedings of the ACM Workshop on Hot Topics in Networks* (HotNets), Irvine, California, November 2006. (23/114 20.2%)

112. "PRIMED: Community-of-Interest-Based DDoS Mitigation." Patrick Verkaik, Oliver Spatscheck, Jacobus van der Merwe, and Alex C. Snoeren. *Proceedings of the ACM SIGCOMM Workshop on Large Scale Attack Defense*, Pisa, Italy, September 2006. (11/32 34.4%)

113. "Cross-layer Visibility as a Service." Ramana Rao Kompella, Albert Greenberg, Jennifer Rexford, Alex C. Snoeren, and Jennifer Yates. *Proceedings of the ACM Workshop on Hot Topics in Networks* (HotNets), College Park, Maryland, October 2005. (20/100 20%)

114. "Addressing Strategic Behavior in a Deployed Microeconomic Resource Allocator." Chaki Ng, Philip Buonadonna, Brent N. Chun, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the Workshop on Economics of Peer-to-Peer Systems* (P2PEcon), Philadelphia, Pennsylvania, August 2005. (11/36 30.6%)

115. "Cooperative Packet Scheduling via Pipelining in 802.11 Wireless Networks." Ramana Rao Kompella, Sriram Ramabhadran, Ishwar Ramani, and Alex C. Snoeren. *Proceedings of the Workshop on Experimental Approaches to Wireless Network Design and Analysis* (E-WIND), Philadelphia, Pennsylvania, August 2005. (14/32 43.8%)

116. "Brief Announcement: The Overlay Network Content Distribution Problem." Charles Killian, Michael Vrable, Alex C. Snoeren, Amin Vahdat, and Joseph Pasquale. *Proceedings of the ACM Symposium on Principles of Distributed Computing* (PODC '05), Las Vegas, NV, July 2005. (short paper) (58/206 28.2%)

117. "Why Markets Could (But Don't Currently) Solve Resource Allocation Problems in Systems." Jeffrey Shneidman, Chaki Ng, David C. Parkes, Alvin AuYoung, Alex C. Snoeren, Amin Vahdat, and Brent N. Chun. *Proceedings of the USENIX Workshop on Hot Topics in Operating Systems* (HotOS), Santa Fe, New Mexico, June 2005. (24/124 19.4%)

118. "Mirage: A Microeconomic Resource Allocation System for Sensornet Testbeds." Brent N. Chun, Philip Buonadonna, Alvin AuYoung, Chaki Ng, David C. Parkes, Jeffrey Shneidman, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the IEEE Workshop on Embedded Networked Sensors* (EmNetS), Sydney, Australia, May 2005. (17/43 39.5%)

119. "Resource Allocation in Federated Distributed Computing Infrastructures." Alvin AuYoung, Brent N. Chun, Alex C. Snoeren, and Amin Vahdat. *Proceedings of the Workshop on Operating System and Architectural Support for the on demand IT InfraStructure* (OASIS '04), Boston, Massachusetts, October 2004.

120. "Decoupling Policy from Mechanism in Internet Routing." Alex C. Snoeren and Barath Raghavan. *Proceedings of the ACM Workshop on Hot Topics in Networks* (HotNets), Cambridge, Massachusetts, November 2003. (23/119 19.3%)

121. "Priority Forwarding in Ad Hoc Networks with Self-Interested Parties." Barath Raghavan and Alex C. Snoeren. *Proceedings of the Workshop on Economics of Peer-to-Peer Systems* (P2PEcon), Berkeley, California, June 2003. (22/60 36.7%)

122. "The Case for Service Provider Deployment of Super-Peers in Peer-to-Peer Networks." Sumeet Singh, Sriram Ramabhadran, Florin Baboescu, and Alex C. Snoeren. *Proceedings of the Workshop on Economics of Peer-to-Peer Systems* (P2PEcon), Berkeley, California, June 2003. (22/60 36.7%)

123. "Reconsidering Internet Mobility." Alex C. Snoeren, Hari Balakrishnan, and M. Frans Kaashoek. *Proceedings of the 8th Workshop on Hot Topics in Operating Systems* (HotOS), Elmau, Germany, May 2001.

124. "Automated Whole-System Diagnosis of Distributed Services Using Model-Based Reasoning." George Forman, Mudita Jain, Masoud Mansouri-Samani, Joseph Martinka, and Alex C. Snoeren. *Proceedings of the IFIP/IEEE Workshop on Distributed Systems: Operations and Management* (DSOM '98), Newark, Delaware, October 1998. (24/48 50%)

Selected other works

125. "Optical networking within the Lightwave Energy-Efficient Datacenter project [Invited]." William M. Mellette, Alex Forencich, Jason Kelley, Joseph Ford, George Porter, Alex C. Snoeren, and George Papen, *Journal of Optical Communications and Networking*, Volume 11, Issue 12, December 2020.

126. "Toward Optical Switching in the Data Center." William M. Mellette, Alex C. Snoeren, and George Porter. *Proceedings of the IEEE International Conference on High Performance Switching and Routing* (HPSR), Bucharest, Romania, June 2018. (invited paper)

127. "Estimating Profitability of Alternative Crypto-currencies." Danny Yuxing Huang, Kirill Levchenko, and Alex C. Snoeren. *UC San Diego Tech Report CS2017-1019*, December 2017.

128. "The Role of End-to-End Congestion Control in Networks with Fairness-Enforcing Routers." Barath Raghavan, John McCullough, and Alex C. Snoeren. *UC San Diego Tech Report CS2013-0998*, April 2013.

129. "On Failure in Managed Enterprise Networks." Daniel Turner, Kirill Levchenko, Jeffrey C. Mogul, Stefan Savage, Alex C. Snoeren. *Hewlett-Packard Labs Technical Report HPL-2012-101*. May 2012.

130. "Suspending and Resuming Network Applications using Session Continuations." Alex C. Snoeren, Debashis Panigrahi, Shoubhik Mukhopadhyay, Hari Balakrishnan, and M. Frans Kaashoek. *UC San Diego Tech Report CS2008-0921*, April 2008.

131. "Universal Honeyfarm Containment." Jay Chen, John McCullough, and Alex C. Snoeren. *UC San Diego Tech Report CS2007-0902*, September 2007.

132. "The Overlay Network Content Distribution Problem." Charles Killian, Michael Vrable, Alex C. Snoeren, Amin Vahdat, and Joseph Pasquale. *UC San Diego Tech Report CS2005-0824*, May 2005.

133. "New Protocols to Support Internet Traceback." Craig Partridge, Christine Jones, David Waitzman, and Alex C. Snoeren. IETF Internet Draft, `draft-partridge-ippt-discuss-00.txt`, November 2001. *Work-in-progress, expired May 2002.*

134. "TCP Connection Migration." Alex C. Snoeren and Hari Balakrishnan. IETF Internet Draft, `draft-snoeren-tcp-migrate-00.txt`, November 2000. *Work-in-progress, expired May 2001.*

135. "A Short Overview of PROMISE: Automated Diagnosis of Network Printing Systems Using Model-Based Reasoning." George Forman, Mudita Jain, Masoud Mansouri-Samani, Joseph Martinka, and Alex C. Snoeren. *Hewlett-Packard Laboratories Technical Report HPL-98-71*, April 1998.

Research funding

2020 Google, **"A Reconfigurable, Low-Latency Expander-based Cloud Network Fabric"**, $62,000.

2019–22 National Science Foundation (George Porter co-PI), **"Designing Efficient Cloud Datacenter Network Fabrics"**, CNS-1911104, $500,000.

2018 Microsoft, **Microsoft Research Award**, $25,000.

2017–21 Advanced Research Projects Agency-Energy (co-PI; George Papen PI, Alic, Fainman, Ford, Mookherjea, Porter UCSD co-PIs) **"LEED: A Lightwave Energy-Efficient Datacenter"**, $8,800,000.

2017 Facebook, **Facebook Faculty Research Award**, $30,000.

2016–19 National Science Foundation (co-PI; Kirill Levchenko PI, Ranjit Jhala, Stefan Savage co-PIs), **"Foundations of Secure Cyber-Physical Systems of Systems"**, CNS-1646493, $560,000.

2016–19 National Science Foundation (Kirill Levchenko, George Porter, Stefan Savage, Geoff Voelker co-PIs), **"A Dual-Purpose Data Analytics Laboratory"**, CNS-1629973, $548,688.

2016–18 Hewlett Foundation (co-PI; Stefan Savage PI, Kirill Levchenko, George Voelker co-PIs), **"Reasoning about Zero-Day Vulnerabilities and Legal Risks on Third-party Vulnerability Research"**, $200,000.

2015–18 National Science Foundation, (co-PI; George Porter PI), **"Improving Network Performance and Efficiency through Multi-Channel Network Links"**, CNS-1565185, $1,100,000.

2014–17 National Science Foundation, **"Studying and Improving the Performance of Access Networks"**, CNS-1422240, $228,299.

2013–16 National Science Foundation, (co-PI; George Porter PI, George Papen, Joe Ford co-PIs), **"Hybrid Circuit/Packet Networking"**, CNS-1314921, $1,800,000.

2012–17 National Science Foundation, (senior staff; Stefan Savage PI), **"Incorporating the Social and Economic Milieu into Securing Cyberspace"**, CNS-1237264, $4,665,975.

2012–13 National Science Foundation, **"Personalization in the Information Age"**, CNS-1255274, $150,000.

2012 Broadcom (Ken Yocum co-PI), **"SDN Interfaces for Merchant Silicon"**, $40,000.

2012 Google (Ken Yocum co-PI), **"An App-Store Framework for Data Center Networks"**, $58,955.

2012 Ericsson (Ken Yocum co-PI), **"Topology Switching for Data Center Networks"**, $50,000

2011–14 National Science Foundation (Kirill Levchenko, Stefan Savage co-PIs), **"Understanding Network Failure"**, CNS-1116904, $450,000.

2010–12 UCSD Center for Networked Systems (co-PI; Tara Javidi PI), **"Congestion Aware Routing for Mesh Wireless Networks"**, $124,000.

2009–12 GENI Projects Office, **"Open Cirrus Federated Resource Allocation"**, $165,602.

2009–12 National Science Foundation (co-PI; Mohan Paturi PI, Stefan Savage, Mat McCubbins, Joel Sobel co-PIs), **"Network Structure, Incentives, and Outcomes"**, CNS-0905645, $900,000.

2009–12 National Science Foundation (co-PI; Ken Yocum PI), **"Topology Switching for Data Centers and the Clouds Above"**, CNS-0917339, $400,000.

2007–10 National Science Foundation (Stefan Savage, Amin Vahdat, Geoff Voelker co-PIs), **"Privacy Preserving Attribution & Provenance,"** CNS-0722031, $402,000.

2007–9 UCSD Center for Networked Systems (co-PI; Geoff Voelker PI, Stefan Savage, Amin Vahdat co-PIs), **"Extending Virtual Cluster Management and Resource Utilization,"** $130,000.

2007–9 UCSD Center for Networked Systems (co-PI; Ken Yocum PI, Amin Vahdat co-PI), **"Seeding Cloud-Based Services,"** $130,000.

2007–9 UCSD Center for Networked Systems (co-PI; Stefan Savage PI, Geoff Voelker, Amin Vahdat co-PIs), **"System Support for Derived Data Management,"** $130,000.

2007	Cisco (George Varghese, Ramana Rao Kompella co-PIs), **"Designing Router Primitives to Monitor Network Health,"** $100,000.
2007	Google (Stefan Savage, Geoff Voelker co-PIs), **"Automated Cross-Layer Diagnosis of 802.11 Wireless Networks,"** $65,000.
2006–9	National Science Foundation (Ken Yocum co-PI), **"Distributed Rate Limiting,"** CNS-0627167, $360,000.
2006–9	National Science Foundation (Amin Vahdat, Geoff Voelker, Ken Yocum co-PIs), **"Harnessing Virtualized Cluster Resources,"** CNS-0615392, $450,000.
2006–8	UCSD Center for Networked Systems (co-PI; Bill Lin PI), **"Application of Coding to the Internet Backbone,"** $130,000.
2006–8	UCSD Center for Networked Systems (co-PI; Stefan Savage PI and Geoff Voelker co-PI), **"Automating Cross-layer Diagnosis of Enterprise Wireless Networks,"** $110,000.
2006–7	National Science Foundation (Stefan Savage, Amin Vahdat co-PIs), **"Enabling Defense and Deterrence through Private Attribution,"** CNS-0627157, $400,000.
2005–8	National Science Foundation (co-PI; Amin Vahdat PI and Joseph Pasquale co-PI), **"Algorithms and Infrastructure for Shared Mesh-based Broadcast,"** CNS-0520313, $500,000.
2005–7	UC Discovery (Amin Vahdat co-PI), **"Resource Allocation in Federated Distributed Computing Infrastructures,"** $130,821.
2005–7	UCSD Center for Networked Systems (co-PI; Geoff Voelker PI and Amin Vahdat co-PI), **"Network Vivisection: Cloning the Internet,"** $180,000.
2005–7	UCSD Center for Networked Systems (Stefan Savage, Amin Vahdat, Geoff Voelker co-PIs), **"Agile Resource Configuration and Scheduling with Virtual Clusters,"** $140,000.
2004–9	National Science Foundation, **"CAREER: Decoupling Policy from Mechanism in Internet Routing,"** CNS-0347949, $474,000.
2004–9	National Science Foundation (senior staff; Stefan Savage PI), Cybertrust Center Grant, **"Center for Internet Epidemiology and Defenses,"** NSF-0433668, $3,100,000.
2004–7	National Science Foundation (co-PI; Amin Vahdat PI), **"Framework for Designing, Evaluating, and Deploying Global Scale Adaptive Networked Systems,"** CNS-0411307, $345,636.
2004–6	UCSD Center for Networked Systems (co-PI Amin Vahdat), **"Resource Allocation in Federated Distributed Computing Infrastructures,"** $160,000.
2004–6	UCSD Center for Networked Systems (co-PI; Joseph Pasquale PI and Amin Vahdat co-PI), **"QoS-Based Application Middleware,"** $160,000.
2004–6	UCSD Center for Networked Systems (co-PI; Stefan Savage PI and Kimberly Claffy, Amin Vahdat, George Varghese, Geoff Voelker co-PIs), **"Internet Epidemiology,"** $240,000.
2004	National Science Foundation, **"Student Travel Support for ACM HotNets-III Workshop,"** CNS-0436331, $10,000.

Advisees

PHD Joe DeBlasio (2018), Google
Arjun Roy (w/Ken Yocum 2018), Google
Danny Yuxing Huang (w/Kirill Levchenko, 2017), PostDoc, Princeton
Karyn Benson (w/kc claffy, 2016), Akamai
Bhanu Vattikonda (2015), Google
Feng Lu (w/Tara Javidi and Geoffrey Voelker, 2014), Google
Daniel Turner (w/Stefan Savage, 2013), Shopify
Kevin Webb (w/Ken Yocum, 2013), Assistant Professor, Swarthmore College
John McCullough (2012), Google
Alvin AuYoung (2010), Uber
Patrick Verkaik (2010), Meraki
Barath Raghavan (2009), Assistant Professor, University of Southern California
Mikhail Afanasyev (2009), Jaybridge Robotics
Jeannie Albrecht (w/Amin Vahdat, 2007), Professor and Chair, Williams College
Ramana Rao Kompella (w/George Varghese, 2007), Associate Professor, Purdue University

Rajdeep Das, Ben Du (w/kc claffy), Alex Gamero-Garrido (w/Alberto Dainotti), Stewart Grant, Alisha Ukani, and Anil Yelam

MS Sen Zhang (2015), Google
Shaan Mahbubani (2008), HKUST MBA program
Jay Chen (2006), Assistant Professor, NYU Abu Dhabi
Chris Tuttle (w/Stefan Savage, 2005), Google
Erik VandeKieft (2004), IBM
Jon M. Salz (MIT 2002), Streambase

University/Departmental service

2014–18 UCSD Academic Senate Committee on Academic Information Technology
2017–18 UCSD Infrastructure Services Governance Committee
2017–18 UCSD Cybersecurity Governance Committee

2019– **Faculty Equity Advisor**, UCSD Jacobs School of Engineering
2019–20 Chair, UCSD Jacobs School of Engineering Faculty Recruiting Excellence Committee
2015–16 UCSD Jacobs School of Enginering Faculty Recruiting Diversity Committee
2004 UCSD Jacobs School of Engineering Research Review Planning Committee

2019– **Vice Chair**, UCSD Department of Computer Science (Academic Personnel)
2018–19 Chair, UCSD Department of Computer Science Teaching Faculty Recruiting Committee
2013–19 Co-chair, UCSD Department of Computer Science Bylaws Committee
2013–15, 16 Co-chair, UCSD Department of Computer Science Admissions Committee
2011 Chair, UCSD Department of Computer Science Publicity Committee

2009, 17 UCSD Department of Computer Science Faculty Recruiting Committee
2003, 4, 8 UCSD Department of Computer Science Graduate Student Affairs Committee
2004–7 UCSD Department of Computer Science Admissions Committee (Visit Day chair 2005–6)
2006 UCSD Department of Computer Science Computing Committee
2005 UCSD Department of Computer Science Building and Space Committee

1997 Georgia Institute of Technology College of Computing Curriculum Committee
1996 Georgia Institute of Technology Computer Ownership Committee

Courses taught

2003–6, 8–11, 13–15, 17, 18, 20 — **CSE 223B**: Distributing Computing and Systems
Spring '20, '18, '17, '15, '14, '13, '11, '10, '09; Winter '08; Spring '06, '05, '04, '03

2013–15, 18, 19 — **CSE 222A**: Computer Communication Networks
Winter '19, '18, '15, '14, '13

2007, 8, 11 16 — **CSE 221**: Graduate Operating Systems
Fall '16; Winter '16, '11; Fall '08, '07

2010, 13–19 — **CSE 123**: Computer Networks
Fall '19, '18, '17; Winter '17; Spring '16; Fall '15, '14, '13, '10

2003, 5–7, 9, 10 — **CSE 121**: Operating Systems: Architecture and Implementation
Winter '10, '09, '07, '06, '05; Fall '03

2005, 6, 8 — **CSE 120**: Principles of Computer Operating Systems
Spring '08; Fall '06, '05

2019 — **CSE 8B**: Introduction to Computer Science: Java (II)
Spring '19

2003, 7 — **CSE 291**: Topics in Wireless Networking
Spring '07; Winter '03

2001 — **6.033**: Computer Systems Engineering (*Massachusetts Institute of Technology*)
Spring '01

Invited presentations

2017 — "Big Data Begets Big Data: Understanding Modern Datacenter Networks", Keynote, SIGCOMM Big-DAMA Workshop, Los Angeles, California, August 2017.

2011 — "Clue: Privacy-Preserving Network Foresnics", Information Security Seminar, Georgia Tech, Atlanta, Georgia, September 2011.

2010 — "BICMIC: Matching Cluster Configurations to Application Demands", CloudS Workshop, Sydney, Australia, November 2010.

"Practical 802.11: Addressing the Challenges of Diverse Environments", CSIRO, Brisbane, Australia, November 2010.

"California Fault Lines: Understanding the Causes and Impacts of Network Failures", Microsoft Research, Seattle, Washington, September 2010.

"Resource Management in the Cloud", First Mysore-Park Workshop on Building and Programming the Cloud, Infosys, Mysore, India, January 2010.

2008 — "Traffic Policing in the Large: Distributed Rate Limiting," Keynote, EuroFGI Workshop on Quality of Service and Traffic Control, Lisbon, Portugal, December 2008.

"Router Primitives for Fault & Performance Monitoring," Nerd Lunch, Cisco Systems, San Jose, California, November 2008.

"Shaman: Diagnosing Performance Problems in Enterprise 802.11 Networks," UCSD Jacobs School Bay-Area Alumni Meeting, Cisco Systems, San Jose, California, June 2008.

"Shaman: Automatic Cross-Layer Diagnosis of Enterprise 802.11 Wireless Networks," Computer Science Colloquium, Harvey Mudd College, Claremont, California, March 2008.

2007 — "Using Jigsaw to Automatically Diagnose Cross-Layer Faults in Enterprise Wireless Networks," Workshop on Methods and Tools for Network Analysis, Paris, France, July 2007.

"Reconsidering the Requirements for Congestion Control," NeXtworking '07, the Second COST-NSF Workshop on Future Internet, Berlin, Germany, April 2007.

2004 "Authenticated Policy-Compliant Routing," Ericsson, Stockholm, Sweden, September 2004.

2003 "Exploiting the Power of Single-Packet IP Traceback," DARPA Workshop on Control-Theoretic Approaches for Dynamic Information Assurance, Berkeley, California, February 2003.

2002 "Single-Packet IP Traceback," IEEE Computer Communications Workshop (CCW), Sante Fe, New Mexico, October 2002.

2001 "Mesh-Based Content Routing using XML," PEO Interchange XML Initiative (PIXIT) Meeting, The MITRE Corporation, Bedford, Massachusetts, October 2001.

"Hash-Based IP Traceback," Systems Seminar, College of Computing, Georgia Institute of Technology, Atlanta, October 2001.

2000 "TCP Connection Migration," End-to-End Research Group, Cambridge, Massachusetts, June 2000.

Program committees

2017 **Chair,** ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)

2016 **Chair,** ACM Workshop on Hot Topics in Networks (HOTNETS)

2012 **Chair,** ACM International Conference on Mobile Computing and Networking (MOBICOM)

2012 **Chair,** ACM/USENIX Internet Measurement Conference (IMC)

2010 **Chair,** USENIX Symposium on Networked Systems Design & Implementation (NSDI)

2004, 6, 8, 9, 14, 16, 17, 19, 21 ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)

2020 ACM Conference on Computer and Communications Security (CCS)

2009 ACM Conference on Embedded Networked Sensor Systems (SENSYS)

2015 ACM International Conference on Emerging Networking Experiments and Technologies (CoNEXT)

2010, 12, 15 ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS)

2003, 7–10, 12–15, 18 ACM International Conference on Mobile Computing and Networking (MOBICOM)

2010 ACM/USENIX International Conference on Mobile Systems, Applications, and Services (MOBISYS)

2006, 8, 12, 14, 16, 18, 20 ACM/USENIX Internet Measurement Conference (IMC)

2005 IEEE International Conference on Computer Communications (INFOCOM)

2017–18 IEEE Symposium on Security and Privacy (OAKLAND)

2012 ISOC Network and Distributed System Security Symposium (NDSS)

2003, 11 USENIX Annual Technical Conference (ATC)

2006, 7, 10, 11, 16, 18, 19, 21 USENIX Symposium on Networked Systems Design & Implementation (NSDI)

2015 ACM International Workshop on Mobile Computing Systems and Applications (HOTMOBILE)

2011 ACM International Workshop on Mobility in the Evolving Internet Architecture (MOBIARCH)

2015 ACM SIGCOMM Symposium on SDN Research (SOSR)

2018 ACM SIGCOMM Workshop on Self-Driving Networks (SELFDN)

2004, 16 ACM Workshop on Hot Topics in Networks (HOTNETS)

2009 ACM Workshop on Networking, Systems, and Applications on Mobile Handhelds (MOBIHELD)

2008 IEEE Workshop on Internet Network Management (INM)

2013 USENIX Workshop on Hot Topics in Operating Systems (HOTOS)

2011 USENIX Workshop on Hot Topics in Security (HOTSEC)

2004, 5 International Workshop on Peer-to-Peer Systems (IPTPS)

2006, 7 Workshop on the Economics of Networked Systems and Incentive-Based Computing (NETEcon+IBC)

Professional activities

2018– Technical steering committee, ACM SIGCOMM Conference (Chair 2019–20)
2011–18 Steering committee, USENIX Symp. on Networked Systems Design & Implementation (NSDI)
2014 Guest Editor, IEEE Micro
2012–13 IDA/DARPA Defense Science Study Group (DSSG)
2008–12 Area editor, IEEE Transactions on Mobile Computing (TMC)
2007–8 Planning committee, NSF Future Internet Design (FIND) Initiative
2004–8 Steering committee, ACM Workshop on Hot Topics in Networks (HotNets)
2008 Workshop & Tutorial co-chair, ACM SIGCOMM Conference
2006 Shadow PC co-coordinator, ACM SIGCOMM Conference
2004 General chair, ACM Workshop on Hot Topics in Networks (HotNets-III)

Patents

2011 Jacobus van der Merwe, Dan Pei, Thomas Scholl, Aman Shaikh, Alex C. Snoeren, and Patrick Verkaik, *Intelligent Computer Network Routing Using Logically Centralized, Physically Distributed Servers Distinct from Network Routers*. US Patent 8,166,195. Filed January 1, 2011; issued April 24, 2012.

2007 Jacobus van der Merwe, Dan Pei, Thomas Scholl, Aman Shaikh, Alex C. Snoeren, and Patrick Verkaik, *Intelligent Computer Network Routing Using Logically Centralized, Physically Distributed Servers Distinct from Network Routers*. US Patent 7,904,589. Filed May 19, 2007; issued March 8, 2011.

2006 Albert Greenberg, Ramana Rao Kompella, Alex C. Snoeren, and Jennifer Yates, *Method and Apparatus for Fault Localization in a Network*. US Patent 7,577,099. Filed April 6, 2006; issued August 18, 2009.

2002 Walter C. Milliken, Alex C. Snoeren, and Luis A. Sanchez, *Systems and Methods for Point of Ingress Traceback of a Network Attack*. US Patent 7,200,105. Filed January 11, 2002; issued April 3, 2007.