

Keith Winstein

Date: August 1, 2015
Email: keithw@cs.stanford.edu
Online version: <http://cs.stanford.edu/~keithw>

353 Serra Mall, Gates 282
Stanford, CA 94305-9025
+1 617-388-2138

1. Principal field of interest:

Computer Networks

2. Education:

School	Degree	Year
Massachusetts Institute of Technology	Ph.D.	2014
<i>Thesis title:</i> "Transport Architectures for an Evolving Internet"		
<i>Thesis supervisor:</i> Hari Balakrishnan		
Massachusetts Institute of Technology	E.E.	2014
Massachusetts Institute of Technology	M.Eng. E.E.C.S.	2005
<i>Thesis title:</i> "Engineering a Campus-Wide Accessible Music Library"		
<i>Thesis supervisor:</i> Hal Abelson		
Massachusetts Institute of Technology	B.S. E.E.C.S.	2004

3. Work experience:

Employer	Position	Beginning	Ending
Stanford University	Assistant Professor	Oct. 2014	—
Massachusetts Institute of Technology	Postdoctoral Associate	June 2014	Oct. 2014
Ksplice Inc.	V.P. Bus. Dev., Product Mgmt.	Dec. 2009	July 2011
The Wall Street Journal	Staff Reporter	Jan. 2007	Dec. 2009

4. Publications:

Journal articles

1. Anirudh Sivaraman, Keith Winstein, Pauline Varley, Somak Das, Joshua Ma, Ameesh Goyal, João Batalha, and Hari Balakrishnan, "Protocol Design Contests," *SIGCOMM Computer Communications Review*, July 2014.

Conference proceedings

1. Ravi Netravali, Anirudh Sivaraman, Somak Das, Ameesh Goyal, Keith Winstein, James Mickens, and Hari Balakrishnan, "Mahimahi: Accurate Record-and-Replay for HTTP," *USENIX Annual Technical Conference 2015*, Santa Clara, Calif., July 2015.
2. Anirudh Sivaraman, Keith Winstein, Pratiksha Thaker, and Hari Balakrishnan, "An Experimental Study of the Learnability of Congestion Control," *SIGCOMM 2014*, Chicago, Ill., August 2014.
3. Anirudh Sivaraman, Keith Winstein, Suvinay Subramanian, and Hari Balakrishnan, "No Silver Bullet: Extending SDN to the Data Plane," *HotNets 2013*, College Park, Md., November 2013.
4. Keith Winstein and Hari Balakrishnan, "TCP ex Machina: Computer-Generated Congestion Control," *SIGCOMM 2013*, Hong Kong, China, August 2013.
5. Keith Winstein, Anirudh Sivaraman, and Hari Balakrishnan, "Stochastic Forecasts Achieve High Throughput and Low Delay over Cellular Networks," *NSDI 2013*, Lombard, Ill., April 2013.

6. Keith Winstein and Hari Balakrishnan, “Mosh: An Interactive Remote Shell for Mobile Clients,” *USENIX Annual Technical Conference 2012*, Boston, Mass., June 2012.
7. Keith Winstein and Hari Balakrishnan, “End-to-End Transmission Control by Modeling Uncertainty about the Network State,” *HotNets 2011*, Cambridge, Mass., November 2011.

Invited articles

1. Keith Winstein, “Introducing the ‘right to eavesdrop on your things,’” *The Agenda*, Politico, June 2015.
2. Keith Winstein and Hari Balakrishnan, “Mosh: A State-of-the-Art Good Old-Fashioned Mobile Shell,” *login: magazine*, USENIX Assoc., August 2012.

Technical reports

1. Henry Corrigan-Gibbs and Keith Winstein, “Some of the Math in the November 8, 2014 Draft of ‘Challenging the Randomness of Panel Assignment in the Federal Courts of Appeals,’ Including the Bottom-Line Statistical Analysis, is Incorrect,” available at SSRN, November 2014.
2. Keith Winstein, “Engineering a Campus-Wide Accessible Music Library,” *MIT M.Eng. thesis*, February 2005.
3. Reina Riemann and Keith Winstein, “Improving 802.11 Range with Forward Error Correction,” *MIT CSAIL A.I. Memo 2005-004*, December 2003.
4. Keith Winstein, “Lexical Steganography through Adaptive Modulation of the Word Choice Hash,” *Intel Science Talent Search (1998–9)*, Washington, D.C., December 1998.

5. Software published:

1. Remy. Tool for developing and understanding new computer-generated congestion-control algorithms (<http://mit.edu/remy>).
2. Sprout. Transport protocol for cellular wireless networks (<http://alfalfa.mit.edu>).
3. Mosh (mobile shell). Remote terminal application with support for IP roaming, intermittent connectivity, and speculative local echo. Distributed by Ubuntu, Debian, Fedora, Chrome app store, Android Play Store, MacPorts, Homebrew, FreeBSD, Arch Linux, Gentoo, Cygwin (<http://mosh.mit.edu>).
4. onepingonly. Python library for teaching modulation and data compression by sending information acoustically over speaker and receiving via microphone. Used in MIT 6.02 introductory course.
5. biostat. Statistical package for efficiently calculating “exact” statistical confidence intervals and their coverage probability curves.
6. Mahimahi. Composable command-line tools using Linux containers to emulate network behaviors and replay complex Web sites (<http://mahimahi.mit.edu>).

6. Invited presentations:

1. July 7, 2014, “Lazy Networking for Lousy Networks”, *Google Tech Talk*, Mountain View, Calif.
2. June 26, 2015, “TCP ex Machina: computer-generated protocols for decentralized sharing on the Internet,” *ExCAPE Summer School on Software Synthesis*, Cambridge, Mass.

3. October 16, 2014, “Transport Architectures for an Evolving Internet,” *Netflix Tech Talk*, Los Gatos, Calif.
4. October 14, 2014, “Lazy Networking for Lousy Networks,” *University of Waterloo*, Waterloo, Canada.
5. August 12, 2014, “And the Bayesians and the frequentists shall lie down together. . .,” *Summer Program in Applied Rationality and Cognition*, Berkeley, Calif.
6. March 6, 2014, “Stochastic Forecasts Achieve High Throughput and Low Delay over Cellular Networks,” *Transport Area Open Meeting*, IETF 89, London, U.K.
7. March 5, 2014, “Transport Architectures for an Evolving Internet,” *Applied Networking Research Prize lecture*, Internet Research Task Force, IETF 89, London, U.K.
8. March 3, 2014, “TCP ex Machina: Computer-Generated Congestion Control,” Internet Congestion Control Research Group, IETF 89, London, U.K.
9. Feb. 12, 2014, “And the Bayesians and the frequentists shall lie down together. . .,” Harvard Informatics Seminar, *Harvard Medical School*, Boston, Mass.
10. Oct. 31, 2013, “And the Bayesians and the frequentists shall lie down together. . .,” Computational Radiology Laboratory, *Children’s Hospital*, Boston, Mass.
11. Oct. 24, 2013, “App-Centric Transport,” *Facebook Tech Talk*, Facebook Inc., Menlo Park, Calif.
12. Oct. 23, 2013, “TCP ex Machina: Computer-Generated Congestion Control,” *Introduction to Computer Networking (CS144) guest lecture*, Stanford University, Palo Alto, Calif.
13. Oct. 16, 2013, “And the Bayesians and the frequentists shall lie down together. . .,” *CSAIL Seminar*, MIT, Cambridge, Mass.
14. Oct. 7, 2013, “TCP ex Machina: Machine-Generated Congestion Control,” *Wireless@MIT Annual Retreat*, Cambridge, Mass.
15. Oct. 3, 2013, “The Evolution of Wireless Video” (panel discussion), *MobiCom 2013*, Miami, Fla.
16. Aug. 14, 2013, “TCP ex Machina: Computer-Generated Congestion Control,” *SIGCOMM 2013*, Hong Kong, China.
17. June 20, 2013, “Rethinking transport for a changing Internet,” *Joint Technical Community Network-Microsoft Research Seminar*, Microsoft Corp., Redmond, Wash.
18. June 18, 2013, “Rethinking transport for a changing Internet,” *Cisco SF Tech Talk*, Cisco Meraki, San Francisco, Calif.
19. May 23, 2013, “Mosh: A State-of-the-Art Good Old-Fashioned Mobile Shell,” *Workgroup on Software*, Université Pierre et Marie Curie (Jussieu, Paris 6), Paris, France.
20. May 23, 2013, “Rethinking transport on the Internet,” *Seminar on Proofs, Programs and Systems*, Centre National de la Recherche Scientifique and Université Paris Diderot (Paris 7), Paris, France.
21. April 5, 2013, “Stochastic Forecasts Achieve High Throughput and Low Delay over Cellular Networks,” *NSDI 2013*, Lombard, Ill.
22. March 15, 2013, “The 2012–2013 Divergence of Google Flu Trends,” Children’s Hospital Informatics Program, *Children’s Hospital*, Boston, Mass.
23. Nov. 15, 2012, “Transport Protocols for Gracefully Mobile Applications,” *Google Tech Talk*, Google Inc., Cambridge, Mass.

24. Oct. 11, 2012, “Videoconferencing with Alfalfa: How to beat Skype, Facetime, and Hangout over Wireless Networks,” Inauguration of the MIT Center for Wireless Networks and Mobile Computing (Wireless@MIT), Cambridge, Mass.
25. July 28, 2012, “Congestion Control for Interactive Real-Time Flows on Today’s Internet,” IAB/IRTF workshop on Congestion Control for Interactive Real-Time Communication, Internet Architecture Board, IETF 84, Vancouver, Canada.
26. July 6, 2012, “Mosh: An Interactive Remote Shell for Mobile Clients,” Hughes Engineering Seminar, Hughes Network Systems, Germantown, Md.
27. June 14, 2012, “Mosh: An Interactive Remote Shell for Mobile Clients,” *USENIX Annual Technical Conference 2012*, Boston, Mass.
28. May 31, 2012, “Mosh: An Interactive Remote Shell for Mobile Clients,” CSAIL Industry Affiliate Program Annual Conference, MIT, Cambridge, Mass.
29. March 27, 2012, “End-to-End Transmission Control through Interference about the Network,” Internet Congestion Control Research Group, IETF 83, Paris, France.
30. Nov. 15, 2011, “End-to-End Transmission Control by Modeling Uncertainty about the Network State,” *HotNets 2011*, Cambridge, Mass.
31. April 22, 2011, “The non-conflict between Bayesians and Frequentists,” University of Texas Computer Science Colloquium, U.T. Austin, Austin, Texas.
32. Aug. 4, 2009, “Statistics and the Media: Getting the Questions and Answers Right” (panel discussion), Joint Statistical Meeting, Washington, D.C.
33. July 17, 2009, “Making Sense of Medical Research” (day-long seminar), American Statistical Association, Alexandria, Va.

7. Teaching experience:

Term	Class
Winter 2015	CS 344G: (Your) Great Ideas for Networked Applications
Spring 2015	CS 81N: Hackers and Heroes
Winter 2016	CS 344G: Network Application Studio
Spring 2016	CS 244: Advanced Topics in Networking

8. Other educational contributions:

1. Revamped laboratory assignments in introductory E.E.C.S. course at MIT. Students now create an audio “modem” using their laptop speaker and microphone as the noisy channel. Previously, class had been taught in simulation. In use at MIT and Stanford.
2. Taught eight-hour course in copyright law in January 2006. Course videos available from MIT OpenCourseWare, Apple iTunes U, YouTube.
3. Co-created Web-based on-demand music library at MIT (“LAMP”), with 2,000 compact discs available for listening via unoccupied cable TV spectrum. Operational 2004–present (400,000+ songs played).
4. Organized “Decrypting DVD” seminars at MIT, January 2001, with representatives of motion picture industry and Harvard University Berkman Center for Internet & Society.

9. Awards and honors:

<u>Award</u>	<u>Organization</u>	<u>Date</u>
SIGCOMM Doctoral Dissertation Award	ACM SIGCOMM	2015
Sprohls Doctoral Thesis Prize	MIT Dept. of E.E.C.S.	2014
Applied Networking Research Prize	Internet Research Task Force	2014
Claude E. Shannon Research Assistantship	MIT Research Lab. of Electronics	2012–2013
Finalist, Excellence in Statistical Reporting Award	American Statistical Association	2009

10. Professional service:

<u>Activity</u>	<u>Dates</u>
Program-committee member, SIGCOMM	2016
Program-committee member, CoNEXT	2015
Program-committee member, SIGCOMM	2015
External reviewer, NSDI	2015
Program-committee member, HotNets	2014
Reviewer, SIGCOMM Computer Communications Review	2013–
Reviewer, IEEE/ACM Transactions on Networking	2013–
Blog wrangler, Layer9.org group blog on computer networking	2013–
External reviewer, NSDI	2012
Program-committee member, SIGCOMM workshop on MedCOMM	2012
U.S. delegate to UNESCO/ICSU World Conference on Science	1999

11. Wall Street Journal articles (selected from 226 articles, 2005–2010):

1. Keith Winstein, “A Simple Health-Care Fix Fizzles Out,” *The Wall Street Journal*, Feb. 11, 2010, pg. A1.
2. Keith Winstein, “The Numbers Guy: Medicine’s Dangerous Guessing Game — Different Methods of Weighing the Risks and Benefits of Medical Treatments Lead to Varying Conclusions About Their Safety,” *The Wall Street Journal*, pg. A19.
3. Keith Winstein, “Harvard Anti-Aging Researcher Quits Shaklee Advisory Board,” *The Wall Street Journal*, Dec. 26, 2008, pg. B1.
4. Keith Winstein, “Boston Scientific Stent Study Flawed,” *The Wall Street Journal*, Aug. 14, 2008, pg. B1.
5. Keith Winstein, Technical Notes to “Boston Scientific Stent Study Flawed,” *The Wall Street Journal*.
6. Keith Winstein, “Why the U.S. Wants to End the Link Between Time and Sun — Astronomers Say Wait a Sec, Sundials Would Be Passé; Mean Blow to Greenwich,” *The Wall Street Journal*, July 29, 2005, pg. A1.

12. Other newspaper articles (selected):

1. Keith Winstein, “The Tech’s Election Model,” *The Tech*, Oct.–Nov. 2004. One of the first day-by-day electoral odds models in a U.S. presidential election.
2. Keith Winstein, “Real Dialogue: The Tech interviews Jack Valenti,” *The Tech*, April 16, 2004, pg. 6.
3. Keith Winstein, “MIT Getting Millions for Digital TV Deal,” *The Tech*, Nov. 8, 2002, pg. 1.