Michael J. Freedman

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Academics

Princeton University .... Princeton, NJ

Full Professor of Computer Science .... Sept 2015 – onward

Associate Professor (with tenure) of Computer Science .... July 2013 – Aug 2015

Assistant Professor of Computer Science .... Sept 2007 – June 2013

New York University, Courant Institute .... New York, NY

Ph.D. in Computer Science .... Sept 2007
Thesis title: *Democratizing Content Distribution*
Visited **Stanford University** to accompany advisor, Sept 2005 – Aug 2007
Advisor: David Mazières ; GPA: 4.0/4.0

M.S. in Computer Science .... May 2005
Advisor: David Mazières ; GPA: 4.0/4.0

Massachusetts Institute of Technology .... Cambridge, MA

M.Eng. in Electrical Engineering and Computer Science .... June 2002
Thesis title: *A Peer-to-Peer Anonymizing Network Layer*
Advisor: Robert Morris ; GPA: 5.0/5.0

S.B. in Computer Science, Minor in Political Science .... June 2001
Thesis title: *An Anonymous Communications Channel for the Free Haven Project*
Advisor: Ron Rivest ; GPA: 4.9/5.0

Wyoming Valley West High School .... Plymouth, PA

Class Valedictorian (1 / 314), June 1997. National Merit Finalist, A.P. Scholar with Distinction

Interests   Distributed systems, networking, and security.

Work experience

9/15–present	**Princeton University**, Full Professor, Princeton, NJ.
2/14–present	**Timescale**, Co-Founder, CEO, CTO, New York, NY.
7/13–8/15	**Princeton University**, Associate Professor (with tenure), Princeton, NJ.
8/07–6/13	**Princeton University**, Assistant Professor, Princeton, NJ.
3/06–11/06	**Illuminics Systems**, Co-founder, Mountain View, CA. Acquired by Quova, Inc.
9/05–8/07	**Stanford University** (SCS Group), Research Staff, Stanford, CA.
5/05–8/05	**University of California, Berkeley**, Research Assistant, Berkeley, CA.
9/02–5/05	**New York University** (SCS Group), Research Assistant, New York, NY.
5/03–8/03	**HP Labs** (Trusted Systems Lab), Research Associate, Princeton, NJ.
9/01–6/02	**MIT Lab for Computer Science** (PDOS Group), Research Assistant, Cambridge, MA.

5/01–8/01	**InterTrust Technologies** (STAR Lab), Research Intern, Santa Clara, CA.
6/00–8/00	**Zero-Knowledge Systems**, Advanced R&D Intern, Montreal, Quebec.
6/99–8/99	**Sun Microsystems** (HPC Group), Software Development Intern, Burlington, MA.
6/98–8/98	**Cognex Corporation**, Software Development Intern, Natick, MA.
9/96–5/97	**System Administrator.** Wilkes University (Simulation Lab), Wilkes-Barre, PA.
6/95–8/95	**Intern.** Michigan State University (HPC Group), East Lansing, MI.

Honors

Faculty Awards

- Princeton Engineering Commendation List for Outstanding Teaching, 2012
- **Presidential Early Career Award for Scientists and Engineers (PECASE)**, awarded by President Obama, 2011 (one of 20 nominated by NSF, 96 across all government agencies)
- DARPA Computer Science Study Group (CSSG) member, 2011 (13 early-career faculty chosen across computer science)
- Alfred P. Sloan Research Fellowship, 2011 (126 across sciences)
- CAREER Award (CSR), National Science Foundation, 2009
- Young Investigator Award, Office of Naval Research, 2009 (15 from science/engineering)
- E. Lawrence Keyes, Jr./Emerson Electric Co. Faculty Advancement Award, Princeton School of Engineering and Applied Science (SEAS), 2009

Publication Awards

- Best Paper, ACM Symposium on Cloud Computing 2017 [2]
- Test of Time Award (for softward-defined networking), ACM SIGCOMM 2017 [46]
- Caspar Bowden Award for Outstanding Research in Privacy Enhancing Technologies, 2017 [9]
- Best Paper, USENIX Annual Technical Conference 2016 [6]
- Finalist, BigApps NYC 2015 [170]
- Spotlight Paper, NIPS 2012 [23]
- Best Student Paper, USENIX Security 2012 [26]
- Selected papers (2 of 6 invited to ACM SIGOPS OSR special issue), LADIS 2012 [92] [93]
- IETF/IRTF Applied Networking Research Prize, Finalist, 2012 [29]
- Community Award, Honorable Mention, NSDI 2012 [29]
- Award paper (invited to ACM SIGOPS OSR special issue), LADIS 2011 [63]
- Highest-ranked paper (fast-tracked to IEEE/ACM ToN), SIGCOMM 2007 [46]
- Best demo award, WORLDS 2005 [49]
- Highest-ranked paper, EUROCRYPT 2004 [55]
- Award paper (invited to ACM TISSEC), CCS 2002 [58]

Doctoral Awards

- Nominated by NYU for ACM Doctoral Dissertation award, 2008
- Janet Fabri Prize, NYU Computer Science, 2008 (best Ph.D. dissertation)
- Henning Biermann Award, NYU Comp. Sci., 2005 (outstanding education and service)
- NDSEG (DoD) Graduate Fellow, 2002-2005
- NYU McCracken Fellow, 2002-2006

- Other awarded graduate fellowships: National Science Foundation (2002-2005); Gordon Wu Fellowship, Princeton (2001); Sterling Prize Fellowship, Yale (2001); Graduate Fellowships, U.C. Berkeley, Carnegie-Mellon, UCSD (2001)

Earlier Honors

- Coca-Cola Scholar, 1997-2001 ; Tylenol Scholar, 1997-1999 ; Big 33 Scholar, 1997-1998
- Tau Beta Pi, 2000 ; Eta Kappa Nu, 2000 ; Sigma Xi, 2000 ; Order of Omega, 1999
- Congressional Award, Silver (1996) and Bronze (1993) medals

Advising

Current Advisees

Ph.D.	Hao (David) Liu, Marcela Melara, Andrew Or, Ashwini Raina, Logan Stafman

Ph.D. Committee

Reader	Linpeng Tang (2018), Muneeb Ali (2017), Naga Katta (2016), Tahir Azim (2013, Stanford), Ewen Cheslack-Postava (2013, Stanford), Wonho Kim (2012), Anirudh Badam (2012), Ariel Feldman (2012), Minlan Yu (2011), Yi Wang (2009), Haakon Ringberg (2009), Changhoon Kim (2009)
Non-Reader	Mina Tahmasbi Arashloo (2019), Muhammad Shahbaz (2018), Harlan Yu (2012), Joe Wenjie Jiang (2011), Yaping Zhu (2011), Sunghwan Ihm (2011), William Josephson (2010), Elliott Karpilovsky (2009),

Previous Advisees

PostDoc	Ariel Rabkin (2012–2014; then Cloudera, now Google) Erik Nordström (2010–2011; Associate Research Scholar, 2011–2013; then Spotify, now Timescale) Steven Ko (2009–2010; then/now Asst. Professor, SUNY-Buffalo)
PhD	Amy Tai (2013-2018, then/now: VMWare Research postdoc) Haoyu (Harris) Zhang (2013-2018, then/now: Google Brain) Aaron Blankstein (2011–2017, then/now: Blockstack) Matvey Arye (2011–2016, then/now: Timescale) Xiaozhou Li (2010–2016, then Barefoot Networks, now co-founder Celer Network) Rob Kiefer (2009–2016, then/now: Timescale) Prem Gopalan (2008–2014, then/now: Voleon Capital Management) David Shue (2008–2014, then/now: Google, Spanner Advanced Projects Group) Wyatt Lloyd (2007–2013, then: Asst. Professor, USC, now: Asst. Professor, Princeton University) Siddhartha Sen (2007–2013, then/now: Researcher, Microsoft Research – SVC/NYC) Jeffrey Terrace (2007–2012, then/now: Google, Cloud Storage Infrastructure Group)
Significant Role	Muneeb Ali (PhD 2017 with Andrea LaPaugh, then co-founder/CEO of Blockstack) Ariel J. Feldman (PhD 2012 with Ed Felten, then two-year PostDoc at UPenn, then/now Asst. Professor, University of Chicago)
Masters	Raghav Setti (2015; then Facebook), Fanglu (Annie) Liu (2015; then Google), Scott Erickson (2014; then Amazon), Marcela Melara (2014; then Princeton PhD candidate), Nicholas Jones (2012; then Elysium Digital), Matvey Arye (2011; then Princeton PhD candidate), Muneeb Ali (2011; then Princeton PhD candidate), Justin Pettit (2007, Stanford; then Nicira Networks), Robert Soule (2004, NYU; then NYU PhD, Cornell postdoc), Jeff Borden (2004, NYU)
Graduate Visitors	Zhongxing Ming (2012-2013; then/now Asst. Professor, Tsinghua University)
Undergrad	**Princeton:** 2018–2019: Andrew Spencer 2016–2017: Hee Joo Nam 2013–2014: Kiiru (Samuel) Gichohi, Andrew Grasso, Gregory Owen 2012–2013: Nicolas Crowell, Craig Liebmann, Torin Rudeen, Anna Kornfeld Simpson, Andrew

Werner

2011–2012: Michael Franklin, Amy Ousterhout

2010–2011: Gabrielle Chen, Eddy Ferreira, Emily Lancaster, Kay Ousterhout, Brandon Podmayersky, Patrick Wendell, Zhihong Xu

2009–2010: Paul Cavallaro, Dmitri Garbuzov, Andrew Gwozdz, Sajid Mehmood, Kay Ousterhout, Chris Rucinski, Patrick Wendell

2008–2009: Newton Allen, Hao Eric Liu, Andrew Schran, Sean Stern, Jennifer Yu

2007–2008: Hal Laidlaw, Mark Spear

Stanford: 2006–2007: Jeffrey Spehar

NYU: 2003–2004: Kevin Shanahan, Ed Kupershlak

Honors by student research advisees

Siebel Graduate Scholarship: Amy Tai (PhD), 2017

NSF Graduate Fellowship: Anna Kornfeld Simpson (as undergrad), 2015

Siebel Graduate Scholarship: Xiaozhou Li (PhD), 2014

Princeton Gordon Wu Prize for Excellence: Prem Gopalan, 2013

Siebel Graduate Scholarship: Marcela Melara (MSE), 2013

Google Anita Borg Memorial Scholarship: Anna Kornfeld Simpson, 2013

Google Anita Borg Memorial Scholarship: Amy Ousterhout, 2013

Hertz and NSF Fellowship: Amy Ousterhout (as undergrad), 2013

Princeton Gordon Wu Prize for Excellence: Wyatt Lloyd, 2012

Google Anita Borg Memorial Scholarship, Finalist: Amy Ousterhout, 2012

Facebook Ph.D. Fellowship, Finalist: Wyatt Lloyd, 2012

CRA Outstanding Undergrad Researcher, Honorable Mention: Zhihong Xu, 2012

Princeton Computer Science, Accenture Prize: Zhihong Xu, 2011

Princeton Computer Science, Accenture Prize: Brandon Podmayersky, 2011

Siebel Graduate Scholarship: Wyatt Lloyd (PhD), 2011

Siebel Graduate Scholarship: Nicholas Jones (MSE), 2011

Princeton SEAS, Calvin Dodd MacCraken Senior Project Award: Patrick Wendell, 2011

Princeton Computer Science, Senior Independent Work Prize: Patrick Wendell, 2011

NDSEG and NSF Graduate Fellowship: Patrick Wendell (as undergrad), 2011

Hertz and NSF Graduate Fellowship: Kay Ousterhout (as undergrad), 2011

CRA Outstanding Undergrad Researcher, Winner (male): Patrick Wendell, 2011

CRA Outstanding Undergrad Researcher, Honorable Mention: Kay Ousterhout, 2011

Google Anita Borg Memorial Scholarship: Kay Ousterhout, 2011

Princeton Computer Science, Accenture Prize: Kay Ousterhout, 2010

Google Ph.D. Fellowship in Fault Tolerance: Siddhartha Sen, 2009-2012

Princeton Computer Science, Senior Thesis Prize: Andrew Schran, 2009

Professional activities

Organizer	SOCC '15 (technical program co-chair)
	LADIS '15 (technical program co-chair)
	SOSP '13 (workshop chair)
	HotDep '12 (technical program co-chair)
	IPTPS '10 (technical program co-chair)
	NSDI '09 (poster chair)
Program comm.	NSDI '19 (Summer)
	NSDI '18
	SOCC '15, HotOS '15
	NSDI '14
	NSDI '13, HotOS '13, HotDep '13
	NSDI '12, FOCI '12
	SIGCOMM '11, HotOS '11, CCS '11, FOCI '11
	OSDI '10, NSDI '10
	SOSP '09, NSDI '09, IEEE Security and Privacy '09, USENIX Technical '09, IPTPS '09, LADIS '09
	CCS '08, CT-RSA '08, IPTPS '08, ROADS '08
	WORLDS '06, UPGRADE-CDN '06
	IRIS Student P2P Workshop '03
Funding Panels	NSF CISE CNS (Ad-hoc) '13 NSF CISE Computer Systems Research (CSR) '10, NSF CISE Network Science and Engineering (NetSE) '09
External reviews	NSDI '16, NSDI '11, NSDI '08, NSDI '07, LATIN '06, HotNets '05, EUROCRYPT '05, Usenix Technical '05, ISC '04, CRYPTO '04, IPDPS '04, INFOCOM '04, CCS '03, SOSP '03, ISC '03, PODC '03, EUROCRYPT '03, WPES '02
Journal reviews	Communications of the ACM (CACM), Transactions on Computer Systems (ToCS), Transactions of Networking (ToN), SIGCOMM Computer Communication Review (CCR), Journal of Computer Security, Journal of Parallel and Distributed Computing (JPDC), Handbook of Internet Security - P2P Security (Wiley & Sons), Computer Journal

Teaching

Numbers correspond to final enrollment tallies, and do not include auditors or mid-term drops.

2/19–6/19	**Instructor.** COS-518 – Advanced Computer Systems, Princeton.
2/18–6/18	**Instructor.** COS-518 – Advanced Computer Systems, Princeton (24 students).
9/17–1/18	**Instructor.** COS-418 – Distributed Systems, Princeton. (50 students)
9/17–1/18	**Instructor.** COS Independent Work Seminar 06 – Building Secure Decentralized Applications Using the Blockchain, Princeton. (9 students)
2/17–6/17	**Instructor.** COS-518 – Advanced Computer Systems, Princeton. (12 students)
9/16–1/17	**Instructor.** COS-418 – Distributed Systems, Princeton. (52 students)
2/14–6/14	**Instructor.** COS-461 – Computer Networks, Princeton. (75 students)
9/13–1/14	**Instructor.** COS-518 – Advanced Computer Systems, Princeton. (33 students)
2/13–6/13	**Instructor.** COS-461 – Computer Networks, Princeton. (56 students)
9/12–1/13	**Instructor.** COS-561 – Advanced Networking, Princeton. (23 students)
9/11–1/12	**Instructor.** COS-518 – Advanced Computer Systems, Princeton. (30 students)

2/11–6/11	**Instructor.** COS-461 – Computer Networks, Princeton. (62 students)
9/10–1/11	**Instructor.** COS-597b – Grad Seminar: Future Datacenter Networks and Systems, Princeton. (20 students)
2/10–6/10	**Instructor.** COS-461 – Computer Networks, Princeton. (49 students)
9/09–1/10	**Instructor.** COS-518 – Advanced Operating Systems, Princeton. (8 students)
2/09–6/09	**Instructor.** COS-461 – Computer Networks, Princeton. (40 students)
9/08–1/09	**Instructor.** COS-597b – Grad Seminar: Systems and Networking for Virtual Worlds, Princeton. (8 students)
9/07–1/08	**Instructor.** COS-518 – Advanced Operating Systems, Princeton. (18 students)
1/04–5/04	**Teaching Assistant, Lab Instructor.** V22.0480 – Computer Networks, NYU.
2/02–5/02	**Teaching Assistant.** 6.033 – Computer System Engineering, MIT.
2/01–5/01	**Teaching Assistant.** 6.033 – Computer System Engineering, MIT.

Service

7/17–present	**Director of Graduate Studies**, Princeton Computer Science.
9/18–present	**Industry Affiliates committee**, Computer Science, Princeton University.
7/17–present	**Policy Committee, Faculty Committee on the Graduate School**, Princeton University.
9/18–9/18	**Silicon Valley Tiger Trek, Faculty Committee**, Princeton University.
7/17–present	**Executive Committee, Entrepreneurship Program**, Princeton Keller Center for Innovation in Engineering Education.
9/16–6/17	**Faculty Hiring Search Committee**, Systems Search Chair, Princeton Computer Science.
4/16–present	**Campus Plan Advisory Group**, Princeton University.
4/13–6/13	**Child Care Provider Selection Working Group**, Princeton University.
9/12–6/13	**Faculty Hiring Search Committee**, Princeton Computer Science.
6/12–9/12	**Chair, Curriculum Committee**, Princeton Computer Science.
9/10–8/13	**Committee on Grading**, Princeton University.
9/10–present	**Academic Advisor and Faculty Fellow.** Princeton A.B. Majors (Freshman and Sophomores), Wilson College.
9/09–5/14	**Departmental Colloquia Organizer.** Princeton Computer Science.
9/08–5/10	**Freshman Academic Advisor.** Princeton B.S.E. Majors, Wilson College.
2/08–5/11	**Academic Advisor.** Princeton Computer Science B.S.E Majors, Class of 2011.
2/08–present	**Faculty Associate.** Princeton Center for Information Technology Policy.
9/07–5/08	**Faculty Fellow.** Princeton Center for Jewish Life.
5/03–5/05	**Founder and Organizer.** NYU Systems Reading Group, New York, NY.
2/04–5/05	**Faculty Representative.** NYU Courant Student Organization, New York, NY.
9/01–5/02	**Co-organizer.** MIT Applied Security Reading Group, Cambridge, MA.
9/97–5/02	**President, VP, Winter School Organizer, Member.** MIT Outing Club, Cambridge, MA

Technical Advisory and Consulting

5/17–2/18	**In8**. Princeton, NJ. Advisor to artificial intelligence and machine learning startup. Acquired by Google Brain.
7/15–present	**Blockstack Labs**. New York, NY. Technical advisor for venture-backed startup focusing on online identity and blockchain infrastructure services.
6/11–7/13	**Institute for Defense Analyses (IDA).** Alexandria, VA.
6/11–12/13	**Intelligent Automation, Inc.** Rockville, MD. Helped design secure content distribution network for dynamic tactical environments, as part of AFOSR project.
3/09–8/10	**Cloudflare**. Bay Area, CA. Advised CDN and security startup that proxies and filters websites' Web and DNS traffic to improve performance and curtail malicious attacks.
8/07–9/08	**NetFlix** Los Gatos, CA. Helped design content distribution network and datacenter architecture to support online distribution of short and full-length videos.
11/06–9/07	**Quova** Mountain View, CA. Helped design and build GeoPoint v6.0, an IP geolocation and analytics platform, which incorporated architectural and technical aspects of illuminati research. Quova was acquired by Neustar in 2010.
	Expert experience with patent, copyright, and digital forensics cases. References available upon request.

Refereed journal and conference publications

- Google Scholar: Citations (13086), h-index (48), i10-index (86), as of December 31, 2018. http://scholar.google.com/citations?user=BFE6IQwAAAAJ

[1] Haoyu Zhang, Brian Cho, Ergin Seyfe, Avery Ching, and **Michael J. Freedman**. Riffle: Optimized shuffle service for large-scale data analytics. In *Proc. European Conference on Computer Systems (EuroSys 18)*, Porto, Portugal, April 2018. 15 pages.

[2] Haoyu Zhang, Logan Stafman, Andrew Or, and **Michael J. Freedman**. SLAQ: Quality-driven scheduling for distributed machine learning. In *Proc. ACM Symposium on Cloud Computing (SOCC 17)*, Santa Clara, CA, September 2017. 14 pages.

[3] Aaron Blankstein, Siddhartha Sen, and **Michael J. Freedman**. Hyperbolic caching: Flexible caching for web applications. In *Proc. USENIX Annual Technical Conference (ATC 17)*, Santa Clara, CA, July 2017. 14 pages.

[4] Michael Wei, Amy Tai, Christopher J. Rossbach, Ittai Abraham, Maithem Munshed, Medhavi Dhawan, Udi Wieder, Scott Fritchie, Steven Swanson, **Michael J. Freedman**, and Dahlia Malkhi. vCorfu: A cloud-scale object store on a shared log. In *Proc. 14th Symposium on Networked Systems Design and Implementation (NSDI 17)*, Boston, MA, March 2017. 15 pages.

[5] Haoyu Zhang, Ganesh Ananthanarayanan, Peter Bodik, Matthai Philipose, Paramvir Bahl, and **Michael J. Freedman**. Live video analytics at scale with approximation and delay-tolerance. In *Proc. 14th Symposium on Networked Systems Design and Implementation (NSDI 17)*, Boston, MA, March 2017. 16 pages.

[6] Amy Tai, Michael Wei, **Michael J. Freedman**, Ittai Abraham, and Dahlia Malkhi. Replex: A scalable, highly available multi-index store. In *Proc. USENIX Annual Technical Conference (ATC 16)*, Denver, CO, June 2016. 14 pages.

[7] Muneeb Ali, Jude Nelson, Ryan Shea, and **Michael J. Freedman**. Blockstack: Design and implementation of a global naming system with Blockchains. In *Proc. USENIX Annual Technical Conference (ATC 16)*, Denver, CO, June 2016. 14 pages.

[8] Xiaozhou Li, Raghav Setti, David G. Andersen, Michael Kaminsky, and **Michael J. Freedman**. Be fast, cheap and in control with SwitchKV. In *Proc. 13th Symposium on Networked Systems Design and Implementation (NSDI 16)*, Santa Clara, CA, March 2016. 14 pages.

[9] Marcela Melara, Aaron Blankstein, Joseph Bonneau, Edward Felten, and **Michael J. Freedman**. Bringing Deployable Key Transparency to End Users. In *Proc. USENIX Security*, Washington, D.C., August 2015. 16 pages.

[10] Naga Katta, Haoyu Zhang, **Michael J. Freedman**, and Jennifer Rexford. Ravana: Controller fault-tolerance in software-defined networking. In *Proc. Symposium on SDN Research*, Santa Clara, CA, June 2015. 12 pages.

[11] **Michael J. Freedman**, Carmit Hazay, Kobbi Nissim, and Benny Pinkas. Efficient set intersection with simulation-based security. *IACR Journal of Cryptology*, October 2014. 35 pages.

[12] Robert Kiefer, Erik Nordström, and **Michael J. Freedman**. From Feast to Famine: Managing mobile network resources across environments and preferences. In *Proc. 2nd USENIX Conference on Timely Results in Operating Systems (TRIOS)*, Broomfield, CO, October 2014. 14 pages.

[13] Peng Sun, Minlan Yu, Michael J. Freedman, Jennifer Rexford, and David Walker. HONE: Joint Host-Network Traffic Management in Software-Dened Networks. *Journal of Network and Systems Management, special issue on software-defined networking*, July 2014. 26 pages.

[14] Tom Anderson et al. A brief overview of the NEBULA future internet architecture. *ACM SIGCOMM Computer Communication Review (CCR)*, 44, July 2014. 6 pages.

[15] Aaron Blankstein and **Michael J. Freedman**. Automating isolation and least privilege in web services. In *Proc. 35th IEEE Symposium on Security and Privacy*, San Jose, CA, May 2014. 16 pages.

[16] David Shue and **Michael J. Freedman**. From app requests to virtual IOPs: Provisioned key-value storage with Libra. In *Proc. ACM European Conference on Computer Systems (EuroSys)*, Amsterdam, The Netherlands, April 2014. 14 pages.

[17] Xiaozhou Li, David G. Andersen, Michael Kaminsky, and **Michael J. Freedman**. Algorithmic improvements for fast concurrent cuckoo hashing. In *Proc. ACM European Conference on Computer Systems (EuroSys)*, Amsterdam, The Netherlands, April 2014. 14 pages.

[18] Ariel Rabkin, Matvey Arye, Siddhartha Sen, Vivek Pai, and **Michael J. Freedman**. Aggregation and Degradation in JetStream: Streaming analytics in the wide area. In *Proc. 11th Symposium on Networked Systems Design and Implementation (NSDI 14)*, Seattle, WA, April 2014. 14 pages.

[19] Siddhartha Sen, David Shue, Sunghwan Ihm, and **Michael J. Freedman**. Scalable, optimal flow routing in datacenters via local link balancing. In *Proc. 9th International Conference on emerging Networking EXperiments and Technologies (CoNEXT 13)*, Santa Barbara, CA, December 2013. 12 pages.

[20] Xiaozhou Li and **Michael J. Freedman**. Scaling IP multicast on datacenter topologies. In *Proc. 9th International Conference on emerging Networking EXperiments and Technologies (CoNEXT 13)*, Santa Barbara, CA, December 2013. 12 pages.

[21] Wyatt Lloyd, **Michael J. Freedman**, Michael Kaminsky, and David G. Andersen. Stronger semantics for low-latency geo-replicated storage. In *Proc. 10th Symposium on Networked Systems Design and Implementation (NSDI 13)*, Lombard, IL, April 2013. 14 pages.

[22] David Shue, **Michael J. Freedman**, and Anees Shaikh. Fairness and isolation in multi-tenant storage as optimization decomposition. *ACM SIGOPS Operating System Review*, 47(1), January 2013. 6 pages.

[23] Prem Gopalan, David Mimno, Sean Gerrish, **Michael J. Freedman**, and David Blei. Scalable inference of overlapping communities. In *Proc. Neural Information Processing Systems (NIPS 12)*, Lake Tahoe, NV, December 2012. Spotlight paper, 9 pages.

[24] Matvey Arye, Erik Nordström, Robert Kiefer, Jennifer Rexford, and **Michael J. Freedman**. A formally-verified migration protocol for mobile, multi-homed hosts. In *Proc. IEEE International Conference on Network Protocols (ICNP 12)*, Austin, TX, October 2012. 10 pages.

[25] David Shue, **Michael J. Freedman**, and Anees Shaikh. Performance isolation and fairness for multi-tenant cloud storage. In *Proc. 10th Symposium on Operating Systems Design and Implementation (OSDI 12)*, Hollywood, CA, October 2012. 14 pages.

[26] Ariel J. Feldman, Aaron Blankstein, **Michael J. Freedman**, and Edward W. Felten. Social networking with Frientegrity: Privacy and integrity with an untrusted provider. In *Proc. USENIX Security*, Bellevue, WA, August 2012. 16 pages.

[27] Jeffrey Terrace, Ewen Cheslack-Postava, Philip Levis, and **Michael J. Freedman**. Unsupervised conversion of 3D models for interactive metaverses. In *Proc. IEEE International Conference on Multimedia & Expo (ICME 12)*, Melbourne, Australia, July 2012. 6 pages.

[28] Ewen Cheslack-Postava, Tahir Azim, Behram F. T. Mistree, Daniel Reiter Horn, Jeff Terrace, Philip Levis, and **Michael J. Freedman**. A scalable server for 3D metaverses. In *Proc. USENIX Annual Technical Conference (ATC 12)*, Boston, MA, June 2012. 14 pages.

[29] Erik Nordström, David Shue, Prem Gopalan, Rob Kiefer, Matvey Arye, Steven Ko, Jennifer Rexford, and **Michael J. Freedman**. Serval: An end-host stack for service-centric networking. In *Proc. 9th Symposium on Networked Systems Design and Implementation (NSDI 12)*, San Jose, CA, April 2012. 14 pages.

[30] Siddhartha Sen and **Michael J. Freedman**. Commensal Cuckoo: Secure group partitioning for large-scale services. *ACM SIGOPS Operating System Review*, January 2012. 7 pages.

[31] Patrick Wendell and **Michael J. Freedman**. Going Viral: Flash crowds in an open CDN. In *Proc. 11th ACM SIGCOMM Conference on Internet Measurement (IMC 11)*, Berlin, Germany, November 2011. 7 pages.

[32] Wyatt Lloyd, **Michael J. Freedman**, Michael Kaminsky, and David G. Andersen. Don't settle for eventual: Scalable causal consistency for wide-area storage with COPS. In *Proc. 23rd ACM Symposium on Operating Systems Principles (SOSP 11)*, Cascais, Portugal, October 2011. 16 pages.

[33] Christina Aperjis, **Michael J. Freedman**, and Ramesh Johari. Bilateral and multilateral exchanges for peer-assisted content distribution. *IEEE/ACM Transactions on Networking*, 19(5), October 2011. 14 pages.

[34] Siddhartha Sen, Sunghwan Ihm, Kay Ousterhout, and **Michael J. Freedman**. Bridging the theory-practice gap in multi-commodity flow routing (brief announcement). In *25th International Symposium on Distributed Computing (DISC 11)*, Rome, Italy, September 2011. 2 pages.

[35] Nate Foster, Rob Harrison, **Michael J. Freedman**, Christopher Monsanto, Jennifer Rexford, Alec Story, and David Walker. Frenetic: A network programming language. In *Proc. ACM SIGPLAN International Conference on Functional Programming (ICFP 11)*, Tokyo, Japan, September 2011. 13 pages.

[36] Wyatt Lloyd and **Michael J. Freedman**. Coercing clients into facilitating failover: Transparent recovery for object delivery services. In *41st IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 11), Dependable Computing and Communication Symposium (DCCS) track*, Hong Kong, China, June 2011. 12 pages.

[37] Ariel J. Feldman, William P. Zeller, **Michael J. Freedman**, and Edward W. Felten. SPORC: Group collaboration using untrusted cloud resources. In *Proc. 9th Symposium on Operating Systems Design and Implementation (OSDI 10)*, Vancouver, BC, October 2010. 14 pages.

[38] Minlan Yu, Jennifer Rexford, **Michael J. Freedman**, and Jia Wang. Scalable flow-based networking with DIFANE. In *Proc. ACM SIGCOMM Conference*, New Delhi, India, August 2010. 12 pages.

[39] Patrick Wendell, Joe Wenjie Jiang, **Michael J. Freedman**, and Jennifer Rexford. DONAR: Decentralized server selection for cloud services. In *Proc. ACM SIGCOMM Conference*, New Delhi, India, August 2010. 12 pages.

[40] Benny Applebaum, Haakon Ringberg, **Michael J. Freedman**, Matthew Caesar, and Jennifer Rexford. Collaborative, privacy-preserving data aggregation at scale. In *Proc. 10th Privacy Enhancing Technologies Symposium (PETS 10)*, Berlin, Germany, July 2010. 18 pages.

[41] **Michael J. Freedman**. Experiences with CoralCDN: A five-year operational view. In *Proc. 7th Symposium on Networked Systems Design and Implementation (NSDI 10)*, San Jose, CA, April 2010. 16 pages.

[42] Siddhartha Sen, Wyatt Lloyd, and **Michael J. Freedman**. Prophecy: Using history for high-throughput fault tolerance. In *Proc. 7th Symposium on Networked Systems Design and Implementation (NSDI 10)*, San Jose, CA, April 2010. 16 pages.

[43] Martin Casado, **Michael J. Freedman**, Justin Pettit, Jianying Luo, Natasha Gude, Nick McKeown, and Scott Shenker. Rethinking enterprise network control. *IEEE/ACM Trans. Networking*, 17(4), 2009. 14 pages.

[44] Jeff Terrace and **Michael J. Freedman**. Object storage on CRAQ: High-throughput chain replication for read-mostly workloads. In *Proc. USENIX Annual Technical Conference*, San Diego, CA, June 2009. 16 pages.

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[54] Yevgeniy Dodis, **Michael J. Freedman**, Stanislaw Jarecki, and Shabsi Walfish. Versatile padding schemes for joint signature and encryption. In *Proc. 11th ACM Conference on Computer and Communications Security (CCS 04)*, Washington, D.C., October 2004. 10 pages.

[55] **Michael J. Freedman**, Kobbi Nissim, and Benny Pinkas. Efficient private matching and set intersection. In *Advances in Cryptology — EUROCRYPT 2004*, Interlaken, Switzerland, May 2004. 18 pages.

[56] Maxwell Krohn, **Michael J. Freedman**, and David Mazières. On-the-fly verification of rateless erasure codes for efficient content distribution. In *Proc. IEEE Symposium on Security and Privacy*, Oakland, CA, May 2004. 15 pages.

[57] **Michael J. Freedman**, Eric Freudenthal, and David Mazières. Democratizing content publication with Coral. In *Proc. 1st Symposium on Networked Systems Design and Implementation (NSDI 04)*, San Francisco, CA, March 2004. 14 pages.

[58] **Michael J. Freedman** and Robert Morris. Tarzan: A peer-to-peer anonymizing network layer. In *Proc. 9th ACM Conference on Computer and Communications Security (CCS 02)*, Washington, D.C., November 2002. 14 pages.

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[59] Jude Nelson, Muneeb Ali, Ryan Shea, and **Michael J. Freedman**. Extending existing blockchains with Virtualchain. In *Proc. Workshop on Distributed Cryptocurrencies and Consensus Ledgers (DCCL 16)*, Chicago, IL, July 2016. 5 pages.

[60] Ariel Rabkin, Matvey Arye, Siddhartha Sen, Vivek Pai, and **Michael J. Freedman**. Making every bit count in wide-area analytics. In *Proc. 14th Workshop on Hot Topics on Operating Systems (HotOS 13)*, Santa Ana Pueblo, NM, May 2013. 6 pages.

[61] Nate Foster, **Michael Freedman**, Rob Harrison, Christopher Monsanto, Mark Reitblatt, Jennifer Rexford, Alec Story, and David Walker. Language abstractions for software-defined networks (position paper). In *Proc. Workshop on Languages for Distributed Algorithms (LADA 12)*, Philadelphia, PA, January 2012. 3 pages.

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[64] Nicholas Jones, Matvey Arye, Jacopo Cesareo, and **Michael J. Freedman**. Hiding amongst the clouds: A proposal for cloud-based onion routing. In *Proc. USENIX Workshop on Free and Open Communications on the Internet (FOCI 11)*, San Francisco, CA, August 2011. 6 pages.

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[70] **Michael J. Freedman**, Christina Aperjis, and Ramesh Johari. Prices are right: Managing resources and incentives in peer-assisted content distribution. In *Proc. 7th International Workshop on Peer-to-Peer Systems (IPTPS 08)*, Tampa Bay, FL, February 2008. 6 pages.

[71] **Michael J. Freedman** and Antonio Nicolosi. Efficient private techniques for verifying social proximity. In *Proc. 6th International Workshop on Peer-to-Peer Systems (IPTPS 07)*, Bellevue, WA, February 2007. 7 pages.

[72] **Michael J. Freedman**, Ion Stoica, David Mazières, and Scott Shenker. Group therapy for systems: Using link-attestations to manage failures. In *Proc. 5th International Workshop on Peer-to-Peer Systems (IPTPS 06)*, Santa Barbara, CA, February 2006. 6 pages.

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[76] **Michael J. Freedman** and David Mazières. Sloppy hashing and self-organizing clusters. In *Proc. 2nd International Workshop on Peer-to-Peer Systems (IPTPS 03)*, Berkeley, CA, February 2003. 6 pages.

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[79] **Michael J. Freedman** and Radek Vingralek. Efficient peer-to-peer lookup based on a distributed trie. In *Proc. 1st International Workshop on Peer-to-Peer Systems (IPTPS 02)*, Cambridge, MA, March 2002. 6 pages.

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[81] Roger Dingledine, **Michael J. Freedman**, David Hopwood, and David Molnar. A reputation system to increase MIX-net reliability. In *Proc. Information Hiding Workshop (IHW 01)*, Pittsburgh, PA, March 2001. 15 pages.

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Invited publications, technical reports, book chapters

[83] Matvey Arye, Siddhartha Sen, and **Michael J. Freedman**. Poor video streaming performance explained (and fixed). *arXiv CoRR*, abs/1901.00038, 2018.

[84] Amy Tai, Andrew Kryczka, Shobhit Kanaujia, Chris Petersen, Mikhail Antonov, Muhammad Waliji, Kyle Jamieson, **Michael J. Freedman**, and Asaf Cidon. Live recovery of bit corruptions in datacenter storage systems. *arXiv CoRR*, abs/1805.02790, 2018.

[85] Muneeb Ali, Jude Nelson, Ryan Shea, and **Michael J. Freedman**. Bootstrapping trust in distributed systems with blockchains. In *;login: The USENIX Magazine*, volume 41, Fall 2016. 7 pages.

[86] Wyatt Lloyd, **Michael J. Freedman**, Michael Kaminsky, and David G. Andersen. Don't Settle for Eventual: Stronger properties for low-latency geo-replicated storage. *Communications of the ACM*, 57(5), May 2014. 16 pages.

[87] Tom Anderson et al. The NEBULA future internet architecture. *LNCS: The Future Internet*, 7857, July 2013. 11 pages.

[88] Wyatt Lloyd, **Michael J. Freedman**, Michael Kaminsky, and David G. Andersen. A short primer on causal consistency. In *;login: The USENIX Magazine*, August 2013. 3 pages.

[89] Nate Foster, **Michael J. Freedman**, Arjun Guha, Rob Harrison, Naga Praveen Katta, Christopher Monsanto, Joshua Reich, Mark Reitblatt, Jennifer Rexford, Cole Schlesinger, Alec Story, and David Walker. Languages for software-defined networks. *IEEE Communications Magazine*, 51(2), February 2013. 7 pages (invited).

[90] Ariel Feldman, Aaron Blankstein, **Michael J. Freedman**, and Edward W. Felten. Privacy and integrity are possible in the untrusted cloud. *IEEE Data Engineering Bulletin*, 35(4), December 2012. 10 pages (invited).

[91] Matvey Arye, Robert Kiefer, Kyle Super, Erik Nordström, **Michael J. Freedman**, Eric Keller, Tom Rondeau, and Jonathan M. Smith. Increasing network resilience through edge diversity in NEBULA. *ACM Mobile Computing and Communications Reveiw*, 16(3), December 2012. 7 pages (invited).

[92] Matvey Arye, Siddhartha Sen, Ariel Rabkin, and **Michael J. Freedman**. Towards efficient stream processing at global scale. In *Proc. Large-Scale Distributed Systems and Middleware (LADIS 12)*, Madeira, Portugal, July 2012. 2 pages.

[93] David Shue, **Michael J. Freedman**, and Anees Shaikh. Towards predictable multi-tenant shared cloud storage. In *Proc. Large-Scale Distributed Systems and Middleware (LADIS 12)*, Madeira, Portugal, July 2012. 3 pages.

[94] **Michael J. Freedman**, Matvey Arye, Prem Gopalan, Steven Y. Ko, Erik Nordström, Jennifer Rexford, and David Shue. Service-centric networking with SCAFFOLD. Technical Report TR-885-10, Princeton University, Dept. Computer Science, September 2010. 14 pages.

[95] Daniel Horn, Ewen Cheslack-Postava, Behram F.T. Mistree, Tahir Azim, Jeff Terrace, **Michael J. Freedman**, and Philip Levis. To infinity and not beyond: Scaling communication in virtual worlds with Meru. Technical Report CSTR 2010-01 5/11/10, Stanford University, Dept. Computer Science, 2010. 13 pages.

[96] Daniel Horn, Ewen Cheslack-Postava, Tahir Azim, **Michael J. Freedman**, and Philip Levis. Scaling virtual worlds with a physical metaphor. *IEEE Pervasive Computing*, 8(3), July 2009. 5 pages.

[97] Christina Aperjis, **Michael J. Freedman**, and Ramesh Johari. Comparing multilateral and bilateral exchange models for content distribution (invited). In *IEEE Information Theory Workshop*, Volos, Greece, June 2009. 2 pages.

[98] **Michael J. Freedman**. Automating server selection with OASIS. In *;login: The USENIX Magazine*, October 2006. 7 pages.

[99] Roger Dingledine, **Michael J. Freedman**, David Molnar, and David Parkes. Reputation. In *Digital Government Civic Scenario Workshop*, Cambridge, MA, April 2003.

[100] Roger Dingledine, **Michael J. Freedman**, and David Molnar. *Peer-to-Peer: Harnessing the Power of Disruptive Technology*, chapter Accountability. O'Reilly, 2001. 70 pages.

[101] Roger Dingledine, **Michael J. Freedman**, and David Molnar. *Peer-to-Peer: Harnessing the Power of Disruptive Technology*, chapter Free Haven. O'Reilly, 2001. 30 pages.

Patents

[102] Matvey Arye, **Michael J. Freedman**, Robert Kiefer, Ajay A. Kulkarni, Erik Nordstrm, and Olof Rensfelt. Scalable database system for querying time-series data. United States Patent #US10073903B1. Provisional filed Feb. 27, 2017. Application filed Feb. 27, 2018. Issued Sept. 11, 2018.

[103] Matvey Arye, **Michael J. Freedman**, Robert Kiefer, Ajay A. Kulkarni, Erik Nordstrm, and Olof Rensfelt. Adjusting partitioning policies of a database system in view of storage reconfiguration. United States Patent #US10073888B1. Provisional filed Feb. 27, 2017. Application filed Feb. 27, 2018. Issued Sept. 11, 2018.

[104] Matvey Arye and **Michael J. Freedman**. System and method for improving streaming video via better buffer management. United States Patent Application, Serial #US2017/035126. Provisional filed May 31, 2016. Application filed May 31, 2017.

[105] Martin Casado and **Michael J. Freedman**. System and method of middlebox detection and characterization. United States Patent #8,463,904. Filed Dec. 2, 2011. Issued June 11, 2013.

[106] Martin Casado and **Michael J. Freedman**. System and method of middlebox detection and characterization. United States Patent #8,204,982. Filed Sept. 14, 2007. Issued June 19, 2012.

Posters and demos

[107] Haoyu Zhang, Logan Stafman, Andrew Or, and **Michael J. Freedman**. SLAQ: Quality-driven scheduling for distributed machine learning (extended abstract and poster). In *SysML Conference*, Stanford, CA, 2018.

[108] Marcela S. Melara, David Liu, Edward W. Felten, and **Michael J. Freedman**. Protecting the IoT against data leaks through intra-process access control (poster). In *Security and Privacy Day*, New York, NY, 2017.

[109] Haoyu Zhang, Logan Stafman, Andrew Or, and **Michael J. Freedman**. SLAQ: Quality-driven scheduling for distributed machine learning (poster). In *ACM Symposium on Cloud Computing (SOCC 17)*, Santa Clara, CA, 2017.

[110] Amy Tai, Michael Wei, **Michael J. Freedman**, Ittai Abraham, and Dahlia Malkhi. Replex: A scalable, highly available multi-index store. In *USENIX Annual Technical Conference (ATC 16)*, Denver, CO, June 2016.

[111] Muneeb Ali, Jude Nelson, Ryan Shea, and **Michael J. Freedman**. Blockstack: Design and implementation of a global naming system with Blockchains (poster). In *USENIX Annual Technical Conference (ATC 16)*, Denver, CO, June 2016.

[112] Aaron Blankstein and **Michael J. Freedman**. Automatic application security with Passe (poster). In *24th ACM Symposium on Operating Systems Principles (SOSP 13)*, Farmington, PA, November 2013.

[113] Xiaozhou Li, David G. Andersen, Michael Kaminsky, and **Michael J. Freedman**. Hardware + Algorithms = Seriously concurrent hash tables (poster). In *24th ACM Symposium on Operating Systems Principles (SOSP 13)*, Farmington, PA, November 2013.

[114] Matvey Arye, Ariel Rabkin, Siddhartha Sen, **Michael J. Freedman**, and Vivek Pai. Processing widely-distributed data with JetStream (poster). In *10th Symposium on Operating Systems Design and Implementation (OSDI 12)*, Hollywood, CA, October 2012.

[115] Erik Nordström, David Shue, Rob Kiefer, Prem Gopalan, Matvey Arye, Jennifer Rexford, and **Michael J. Freedman**. Serval: An end-host stack for service-centric networking (poster). In *10th Symposium on Operating Systems Design and Implementation (OSDI 12)*, Hollywood, CA, October 2012.

[116] David Shue, **Michael J. Freedman**, and Anees Shaikh. Performance isolation and fairness for multi-tenant cloud storage (poster). In *10th Symposium on Operating Systems Design and Implementation (OSDI 12)*, Hollywood, CA, October 2012.

[117] Jeffrey Terrace, Ewen Cheslack-Postava, Philip Levis, and **Michael J. Freedman**. Unsupervised conversion of 3D models for interactive metaverses (poster and oral presentation). In *IEEE International Conference on Multimedia & Expo (ICME 12)*, Melbourne, Australia, July 2012.

[118] Erik Nordström, David Shue, Rob Kiefer, Prem Gopalan, Matvey Arye, Jennifer Rexford, and **Michael J. Freedman**. Serval: An end-host stack for service-centric networking (poster). In *9th*

Symposium on Networked Systems Design and Implementation (NSDI 12), San Jose, CA, April 2012.

[119] David Shue, **Michael J. Freedman**, and Anees Shaikh. Performance isolation and fairness for multi-tenant cloud storage (poster). In *9th Symposium on Networked Systems Design and Implementation (NSDI 12)*, San Jose, CA, April 2012.

[120] Siddhartha Sen and **Michael J. Freedman**. Security in peer-to-peer systems revisted (work-in-progress). In *23nd ACM Symposium on Operating Systems Principles (SOSP 11)*, Cascais, Portugal, October 2011.

[121] Matvey Arye, Nicholas Jones, Jacopo Cesareo, and **Michael J. Freedman**. Cloud-based onion routing: Creating economies of scale for anonymity (poster). In *21st Conference on Computers, Freedom, and Privacy*, Washington, D.C., June 2011.

[122] Philip Levis, **Michael J. Freedman**, Ewen Cheslack-Postava, Daniel Reiter Horn, Behram F. T. Mistree, Tahir Azim, Jeff Terrace, Bhupesh Chandra, and Xiaozhou Li. Sirikata: Design and implementation of a next generation metaverse (poster). In *13th Workshop on Hot Topics in Operating Systems (HotOS 11)*, Napa, CA, May 2011.

[123] David Shue, Prem Gopalan, Matvey Arye, Erik Nordström, Steven Y. Ko, **Michael J. Freedman**, and Jennifer Rexford. A service access layer, at your service (demo). In *8th Symposium on Networked Systems Design and Implementation (NSDI 11)*, Boston, MA, March 2011.

[124] Wyatt Lloyd, **Michael J. Freedman**, Michael Kaminsky, and David G. Andersen. Don't settle for eventual: Stronger consistency for wide-area storage (poster). In *8th Symposium on Networked Systems Design and Implementation (NSDI 11)*, Boston, MA, March 2011.

[125] Siddhartha Sen, Sunghwan Ihm, Kay Ousterhout, and **Michael J. Freedman**. Localflow: Simple, local flow scheduling in data centers (poster). In *8th Symposium on Networked Systems Design and Implementation (NSDI 11)*, Boston, MA, March 2011.

[126] **Michael J. Freedman**, Matvey Arye, Prem Gopalan, Steven Y. Ko, Erik Nordström, Jennifer Rexford, and David Shue. Dynamic service access with Serval (demo). In *10th GENI Engineering Conference*, San Juan, Puerto Rico, March 2011.

[127] **Michael J. Freedman**, Matvey Arye, Prem Gopalan, Steven Y. Ko, Erik Nordström, Jennifer Rexford, and David Shue. Service-centric networking with SCAFFOLD (demo). In *9th GENI Engineering Conference*, Arlington, VA, November 2010.

[128] Wyatt Lloyd and **Michael J. Freedman**. Coercing clients into facilitating failover: Transparent recovery for object delivery services (poster). In *9th Symposium on Operating Systems Design and Implementation (OSDI 10)*, Vancouver, B.C., October 2010.

[129] **Michael J. Freedman**, Jennifer Rexford, Steven Y. Ko, Prem Gopalan, and David Shue. A SCAFFOLD for Wide-Area Distributed Services (poster). In *6th GENI Engineering Conference*, Salt Lake City, UT, November 2009.

[130] Siddhartha Sen, Wyatt Lloyd, and **Michael J. Freedman**. Prophecy: Using history for high-throughput fault tolerance (work-in-progress). In *22nd ACM Symposium on Operating Systems Principles (SOSP 09)*, Big Sky, MT, October 2009.

[131] Jeff Terrace and **Michael J. Freedman**. Bringing P2P to the Web: Security and privacy in the Firecoral network (poster). In *6th Symposium on Networked Systems Design and Implementation (NSDI 09)*, Boston, MA, April 2009.

[132] Jeff Terrace and **Michael J. Freedman**. Query-anywhere chain replication (poster). In *2nd Workshop on Large-Scale Distributed Systems and Middleware (LADIS 08)*, Yorktown, NY, September 2008.

[133] Siddhartha Sen, Wyatt Lloyd, and **Michael J. Freedman**. Scaling fault-tolerant systems with history (poster). In *2nd Workshop on Large-Scale Distributed Systems and Middleware (LADIS 08)*, Yorktown, NY, September 2008.

[134] **Michael J. Freedman** and Martin Casado. Measuring the Internet's edge with Illuminati (poster and demo). In *7th USENIX Symposium on Operating Systems Design and Implementation (OSDI 06), 3rd Workshop on Real, Large, Distributed Systems (WORLDS 06)*, Seattle, WA, November 2006.

[135] **Michael J. Freedman**, Karthik Lakshminarayanan, and David Mazières. Building a practical anycast service (demo). In *2nd Workshop on Real, Large, Distributed Systems (WORLDS 05)*, San Francisco, CA, December 2005.

[136] Kevin Shanahan and **Michael J. Freedman**. Saccades: Locality prediction for oblivious clients (poster). In *2nd IRIS Student Workshop on Peer-to-Peer Systems*, Cambridge, MA, November 2004.

[137] Siddhartha Annapureddy, **Michael J. Freedman**, and David Mazières. Shark: A scalable and secure cooperative-caching file system (poster). In *1st Symposium on Networked Systems Design and Implementation (NSDI 04)*, San Francisco, CA, March 2004.

[138] **Michael J. Freedman**, Eric Freudenthal, and David Mazières. Democratizing content publication with Coral (demo). In *1st Symposium on Networked Systems Design and Implementation (NSDI 04)*, San Francisco, CA, March 2004.

Refereed conference presentations

[139] Performant time series data management and analytics with Postgres. Strata Data Conference, March 28 2019.

[140] Performant time series data management and analytics with Postgres. Data Day Texas, January 26 2019.

[141] Performant time series data management and analytics with Postgres. Strata Data Conference, September 12 2018.

[142] Three heretical opinions about the future of time-series data. docScale Conference, June 1 2018.

[143] TimescaleDB: Reengineering PostgreSQL as a time series database. PostgresConf US, April 18 2018.

[144] TimescaleDB: Reengineering PostgreSQL as a time series database. Strata Data Conference, March 8 2018.

[145] When boring is awesome: Making PostgreSQL scale for time-series data. Strata Data Conference, September 27 2017.

[146] TimescaleDB: Re-architecting a SQL database for time-series data. DataEng Conference, October 31 2017.

[147] Building a scalable time-series database on PostgreSQL. PGConf Local: Philly, July 14 2017.

[148] TimescaleDB: Developing a scalable time-series database on PostgreSQL. PGConf US, March 31 2017.

[149] Designing a time series database to support IoT workloads. Strata Data Conference, March 15 2017.

[150] Spark Streaming and IoT. Spark Summit East, February 18 2016.

[151] Collaborative, privacy-preserving data aggregation at scale. 10th Privacy Enhancing Technologies Symposium (PETS 10), July 21 2010.

[152] Experiences with CoralCDN: A five-year operational view. 7th Symposium on Networked Systems Design and Implementation (NSDI 10), April 28 2010.

[153] Prices are Right: Managing resources and incentives in peer-assisted content distribution. 7th International Workshop on Peer-to-Peer Systems (IPTPS 08), February 26 2008.

[154] OASIS: Anycast for any service. 3rd Symposium on Networked Systems Design and Implementation (NSDI 06), May 9 2006.

[155]   Group therapy for systems: Using link attestations to manage failures. 5th International Workshop on Peer-to-Peer Systems (IPTPS 06), February 28 2006.

[156]   OASIS: Anycast for any service. CodeCon, February 10 2006.

[157]   Non-transitive connectivity and DHTs. 2nd Workshop on Real, Large, Distributed Systems (WORLDS 05), December 14 2005.

[158]   Keyword search and oblivious pseudorandom functions. 2nd Theory of Cryptography Conference (TCC 05), Feburary 11 2005.

[159]   Efficient private matching and set intersection. Advances in Cryptology — EUROCRYPT 2004, May 3 2004.

[160]   Democratizing content distribution with Coral. 1st Symposium on Networked Systems Design and Implementation (NSDI 04), March 30 2004.

[161]   Efficient set intersection for privacy-preserving data mining. DIMACS Privacy-Preserving Data Mining, March 15 2004.

[162]   Sloppy hashing and self-organizing clusters. 2nd International Workshop on Peer-to-Peer Systems (IPTPS 03), February 20 2003.

[163]   Tarzan: A peer-to-peer anonymizing network layer. 9th ACM Conference on Computer and Communications Security (CCS 02), November 20 2002.

[164]   The case for network-layer, peer-to-peer anonymization. 1st International Workshop on Peer-to-Peer Systems (IPTPS 02), March 7 2002.

[165]   Privacy engineering in digital rights management systems. ACM Workshop in Security and Privacy in Digital Rights Management (DRM 01), November 5 2001.

Invited conference presentations and panels

[166]   Building a scalable time-series database on PostgreSQL. PGConf US Mini: NYC, September 14 2017.

[167]   Building a scalable time-series database on PostgreSQL. Percona Live, April 26 2017.

[168]   Open source database ecosystem. Percona Live, April 25 2017.

[169]   Poor video streaming performance explained (and fixed). ACM Applicative Conference, June 2 2016.

[170]   City-wide environmental sensing via BreatheNYC. NYC BigApps 2015 - Finals, December 2 2015.

[171]   The Internet of Things, Infinite Opportunities Together (panel). MIT Sloan Alumni Event Series, November 19 2015.

[172]   Stronger consistency for low-latency, geo-replicated storage. Microsoft Research Faculty Summit, July 15 2014.

[173]   Automating isolation and least privilege in web services. DIMACS Workshop on Secure Cloud Computing, March 28 2014.

[174]   Multi-tenant resource allocation for shared cloud storage. New Results in Networking Research 2013, Microsoft Research, December 5 2013.

[175]   Service-centric networking for datacenter services. Eighth Annual Microsoft Research Networking Summit, June 19 2012.

[176]   Service-centric networking with the Serval network stack. DIMACS Workshop on Systems and Networking Advances in Cloud Computing, December 8 2011.

[177]   An Internet primer: Numbers, names, and real people -and- Take-down experiences by a non-commercial content delivery service (keynote). Copyright Cat-and-Mouse: New Developments

in Online Enforcement, Princeton Center for Information Technology Policy (CITP) Workshop, March 13 2012.

[178] Next technical steps (panel). Free and Open Communication on the Internet Workshop, February 24 2011.

[179] Stop building distributed services with a decoupled host-centric network. Vancouver Systems Colloquium (following OSDI 10), October 7 2010.

[180] Meru: A system architecture for Internet-scale virtual worlds. NSF Workshop on Future of Research in Computer Games and Virtual Worlds, September 23 2010.

[181] Make CDNs work for you: Measuring the Internet's edge with Illuminati (talk and panel). New York Systems/Networking Summit, November 17 2006.

[182] Lessons from PlanetLab (panel). WORLDS, November 5 2006.

[183] Supporting clients 24/7: On service deployment and development. PlanetLab Workshop, April 1 2004.

[184] Accountability and resource management in peer-to-peer systems. O'Reilly Peer-to-Peer Conference, February 16 2001.

Other invited presentations

[185] TimescaleDB: Re-engineering PostgreSQL as a time-series database. IBM Linux on Z Meetup, December 1 2017.

[186] TimescaleDB: Re-engineering PostgreSQL as a time-series database. Carnegie Mellon: Time Series Database Lectures, November 16 2017.

[187] TimescaleDB: A scalable time-series database built on PostgreSQL. San Francisco Bay Area PostgreSQL Meetup Group, October 18 2017.

[188] Poor video streaming performance explained (and fixed). Facebook, July 5 2016.

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Support

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- **Michael J. Freedman** (PI), Scott Karlin, Larry Peterson, Jennifer Rexford, with 6 other universities and Stanford University (Nick McKeown–Lead PI). Campus Trials of Enterprise GENI. NSF via the GENI Product Office (BBN). $255K to Princeton. 2009–2011.

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