Roxana Geambasu

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Department of Computer Science
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Specialization Distributed systems, security and privacy, operating systems, cloud computing, mobile computing, big data, Internet of Things

Education

Ph.D. Computer Science, **University of Washington**, Seattle, WA, August 2011. Dissertation: "Empowering Users with Control over Cloud and Mobile Data."

M.S. Computer Science, **University of Washington**, Seattle, WA, 2007.

B.S. Computer Science, **Polytechnic University of Bucharest**, Romania, 2005.

Awards and Honors

Alfred P. Sloan Faculty Fellowship, 2016.

Early Career Award in Cybersecurity from the University of Washington Center of Academic Excellence, 2015.

Microsoft Faculty Fellowship, 2014.

Popular Science "Brilliant 10," 2014.

NSF CAREER Award, 2014.

Elected member of DARPA's Information Science and Technology (ISAT) study group, a select group of cross-discipline experts that provides advice to DARPA on long-range research directions in information sciences and technology, 2014-2017.

Google Research Award, 2013.

Honorable mention for the inaugural SIGOPS Dennis M. Ritchie Dissertation Award, 2013.

The William Chan Memorial Dissertation Award, 2011.

Best Student Paper award at the European Conference on Computer Systems, 2011.

Best Student Paper award at the 18^{th} USENIX Security Symposium, 2009.

Google Ph.D. Fellowship in Cloud Computing, 2009 – 2011.

2010 Madrona Prize.

2009 Madrona Prize.

2008 Madrona Prize.

Valedictorian of the 2005 Computer Science and Electrical Engineering Class at the Polytechnic University of Bucharest (ranked first among ≈500 students), 2005.

Third place at the Romanian National Math Competition, 1999.

Third place at the National Math Competition "Gheorghe Titeica," 2000.

Work Experience

Associate professor of Computer Science, **Columbia University**, NY, NY, 2016 – present.

Assistant professor of Computer Science, **Columbia University**, NY, NY, 2011 – 2016.

Research assistant, **University of Washington**, Seattle, WA, 2006 – 2011.

Software engineering intern, **Google**, Seattle, WA, 2008.

Research intern, **Microsoft Research**, Mountain View, CA, 2007.

RESEARCH ACTIVITIES

Projects

My research aims to expose problems and invent solutions to threats to our data security and privacy in the context of new, emerging technologies, such as cloud computing, mobile devices, and big data. I design, build, and evaluate scalable distributed infrastructures that address these problems.

Ongoing Projects:

Web transparency tools: Today's Web services are like black boxes. They use users' personal information for all sorts of purposes but the users do not know how their data is being used. To enhance transparency, we are building a new set of scalable infrastructures (*XRay* and *Sunlight*) to detect data uses for targeting and personalization. The insight is to compare ads, prices, and other personalized content witnessed by different accounts with similar, but not identical, subsets of the data.

Testing the fairness of data-driven applications: Today's programmers routinely pass immense and varied kinds of personal data through increasingly complex machine learning algorithms, whose associations and inferences are difficult to anticipate and analyze. This results in a great risk for unintended discriminatory or disparate impact effects. We are building *FairTest*, a testing toolkit for programmers to discover unintended associations.

Selective data management: We are challenging a common practice in both private and public sectors of collecting vast quantities of personal information. We ask whether it is possible to build data-driven systems, such as machine learning-based personalization systems, that are more *selective* with the data they collect. This entails pinpointing the data that is valuable for the current and evolving workload, and either not collecting or setting aside the data that is not truly valuable. We are constructing tools to create this separation and data management and protection systems that leverage them to enhance data security and management reduce data management costs through selectivity.

Modern protection abstractions for modern OSes: Data storage abstractions in OSes have evolved enormously. Yet, data protection abstractions are still applied at the old abstraction level, often rendering them ineffective. We are investigating new data protection abstractions that are more suitable for modern operating systems.

Relevant Past Projects:

Heterogeneous-database replication: We are building *Synapse*, a heterogeneous-database replication system, which lets programmers of complex, multi-service Web applications to share data across services running on very distinct database engines, in real time, and with solid consistency semantics. We deployed Synapse at a NYC startup.

Virtual machine migration: We improved virtual machine (VM) migration mechanisms by incorporating past state access histories and hints provided by the guest operating system.

File auditing for mobile devices: With today's limited anti-theft tools, users can neither assuredly restrict nor remotely monitor a thief's data accesses on a stolen or lost mobile device. We built *Keypad*, a new file system that enhances data security on mobile devices by providing users with post-theft fine-grained access auditing.

Cloud storage customization with active storage: Today's cloud storage services, such as Amazon S3, are highly inflexible and impose a variety of constraints on their clients: specific data consistency properties, fixed replication factors, limited logging, etc. We built *Comet*, an extensible storage service that allows clients to inject snippets of code that control the behavior of their data inside the storage service.

Data lifetime control with self-destructing data: Users' migration to cloud and Web services is causing them to lose control over the lifetime of their data. *Vanish* is a self-destructing data

system that allows users to impose timeouts on their Web data, such as emails, Facebook messages, or Google Docs.

Publications (Papers are available at `https://roxanageambasu.github.io/02-publications/`.)

Refereed Conference Papers:

[23] Mathias Lecuyèr, Riley Spahn, Roxana Geambasu, Tzu-Kuo Huang, and Siddhartha Sen. Pyramid: Enhancing Selectivity in Big Data Protection with Count Featurization. In *Proceedings of the IEEE Security and Privacy Symposium (IEEE S&P)*, San Jose, CA, May 2017.

[22] Florian Tramèr, Vaggelis Atlidakis, Roxana Geambasu, Daniel Hsu, Jean-Pierre Hubaux, Mathias Humbert, Ari Juels, Huang Lin. FairTest: Discovering Unwarranted Associations in Data-Driven Applications. In *Proceedings of the IEEE European Symposium on Security and Privacy (EuroS&P)*, Saarbrücken, Germany, March 2017.

[21] Yoshihisa Abe, Roxana Geambasu, Kaustubh Joshi, and Mahadev Satyanarayanan. Urgent Virtual Machine Migration with Enlightened Post-copy. In *Proceedings of the Conference of Virtual Execution Environments (VEE)*, Atlanta, GA, April 2016.

[20] Evangelos Atlidakis, Jeremy Andrus, Roxana Geambasu, Dimitris Mitropoulos, and Jason Nieh. "POSIX Abstractions in Modern Operating Systems: The Old, the New, and the Missing." In *Proceedings of the European Conference on Computer Systems (EuroSys)*, London, UK, April 2016.

[19] Mathias Lecuyer, Riley B. Spahn, Giannis Spiliopoulos, Augustin Chaintreau, Roxana Geambasu, and Daniel Hsu. "Sunlight: Fine-grained Targeting Detection at Scale with Statistical Confidence." In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, Denver, Colorado, October 2015.

[18] Nicolas Viennot, Mathias Lecuyer, Jonathan Bell, Roxana Geambasu, and Jason Nieh. "Synapse: New Data Integration Abstractions for Agile Web Application Development." In *Proceedings of Proceedings of the European Conference on Computer Systems (EuroSys)*, Bordeaux, France, April 2015.

[17] Riley Spahn, Jonathan Bell, Sravan Bhamidipati, Michael Lee, Roxana Geambasu, and Gail Kaiser. "Pebbles: Fine-Grained Data Management Abstractions for Modern Operating Systems." In *Proceedings of USENIX Operating Systems Design and Implementation (OSDI)*, Broomfield, CO, October 2014.

[16] Mathias Lécuyer, Guillaume Ducoffe, Francis Lan, Andrei Papancea, Theofilos Petsios, Riley Spahn, Augustin Chaintreau, and Roxana Geambasu. "XRay: Increasing the Web's Transparency with Differential Correlation." In *Proceedings of the USENIX Security Symposium*, San Diego, CA, August 2014.

[15] Yoshihisa Abe, Roxana Geambasu, Kaustubh Joshi, H. Andres Lagar-Cavilla, and Mahadev Satyanarayanan. "vTube: Efficient Streaming of Virtual Appliances over Last-Mile Networks." In *Proceedings of the ACM Symposium on Cloud Computing (SoCC)*, Santa Clara, CA, October 2013.

[14] Yang Tang, Phillip Ames, Sravan Bhamidipati, Ashish Bijlani, Roxana Geambasu, and Nikhil Sarda. "CleanOS: Limiting Mobile Data Exposure with Idle Eviction." In *Proceedings of the 10th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Hollywood, CA, October 2012.

[13] Roxana Geambasu, John P. John, Tadayoshi Kohno, Steven D. Gribble, and Henry M. Levy. "Keypad: An Auditing File System for Theft-prone Devices." In *Proceedings of the European Conference on Computer Systems (EuroSys)*, Salzburg, Austria, April 2011.
Best Student Paper Award.

[12] Roxana Geambasu, Amit Levy, Tadayoshi Kohno, Arvind Krishnamurthy, and Henry M. Levy. "Comet: An Active Distributed Key/Value Store." In *Proceedings of the* 9^{th} *USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Vancouver, Canada, October 2010.

[11] Roxana Geambasu, Tadayoshi Kohno, Amit Levy, and Henry M. Levy. "Increasing Data Privacy with Self-destructing Data." In *Proceedings of the* 18^{th} *USENIX Security Symposium*, Montreal, Canada, August 2009. **Best Student Paper Award.**

[10] Roxana Geambasu, Cherie Cheung, Alexander Moshchuk, Steven D. Gribble, and Henry M. Levy. "Organizing and Sharing of Web-service Objects with Menagerie." In *Proceedings of the* 17^{th} *International World Wide Web Conference (WWW)*, Beijing, China, April 2008.

[9] Roxana Geambasu, Magdalena Balazinska, Steven D. Gribble, Henry M. Levy. "HomeViews: Peer-to-peer Middleware for Personal Data Sharing Applications." In *Proceedings of the* 26^{th} *ACM International Conference on Management of Data (SIGMOD)*, Beijing, China, June 2007.

Refereed Workshop Papers:

[8] Angelos D. Keromytis, Roxana Geambasu, Simha Sethumadhavan, Salvatore J. Stolfo, Junfeng Yang, Azzedine Benameur, Marc Dacier, Matthew Elder, Darrell Kienzle, and Angelos Stavrou. "The MEERKATS Cloud Security Architecture." In *Proceedings of the 3rd International Workshop on Security and Privacy in Cloud Computing (ICDCS-SPCC)*, Macao, China, June 2012.

[7] Roxana Geambasu, Steven D. Gribble, and Henry M. Levy. "CloudViews: Communal Data Sharing in Public Clouds." In *Proceedings of the* 1^{st} *USENIX Workshop on Hot Topics in Cloud Computing (HotCloud)*, San Diego, CA, June 2009.

[6] Roxana Geambasu, Andrew Birrell, and John MacCormick. "Using Formal Specification to Understand and Compare Fault-tolerant Storage Systems." In *Proceedings of the* 38^{th} *IEEE/IFIP International Conference on Dependable Systems and Networks (DSN-DCCS)*, Anchorage, AK, June 2008.

[5] Roxana Geambasu, Tanya Bragin, Jaeyeon Jung, Magdalena Balazinska. "On-Demand View Materialization and Indexing for Network Forensic Analysis." In *Proceedings of the* 3^{rd} *International Workshop on Networking Meets Databases (NetDB)*, Boston, MA, April 2007.

Dissertation:

[4] Roxana Geambasu. "Regaining Control over Cloud and Mobile Data." Ph.D. dissertation, University of Washington, Seattle, WA, August 2011. **Honorable Mention for the Inaugural Dennis M. Ritchie Doctoral Dissertation Award (2013). The William Chan Memorial Dissertation Award (2011).**

Technical Reports:

[3] Florian Tramer, Evangelos Atlidakis, Roxana Geambasu, Daniel Hsu, Jean-Pierre Hubaux, Mathias Humbert, Ari Juels, and Huang Lin. Discovering Unwarranted Associations in Data-driven Applications with the FairTest Testing Toolkit. Technical report `http://arxiv.org/abs/1510.02377`, 2015.

[2] Mathias Lécuyer, Guillaume Ducoffe, Francis Lan, Andrei Papancea, Theofilos Petsios, Riley Spahn, Augustin Chaintreau, and Roxana Geambasu. "XRay: Increasing the Web's Transparency with Differential Correlation." Technical report `http://arxiv.org/abs/1510.02377`, 2014. Extended version of the USENIX Security'14 paper.

[1] Roxana Geambasu, Tadayoshi Kohno, Arvind Krishnamurthy, Amit Levy, Henry M. Levy, Paul Gardner, and Vinnie Moscaritolo. "New Directions for Self-destructing Data." Technical Report, University of Washington, UW-CSE-11-08-01, 2011. Extended version of the USENIX Security'09 paper.

Code Releases

In-progress open-source release of Pyramid (selective data protection system), 2017. `http://columbia.github.io/pyramid/`.

Open-source release of FairTest (fairness testing tool), 2017. `http://columbia.github.io/fairtest/`.

Open-source release of Sunlight (our second-generation web transparency system), 2015. `http://columbia.github.io/sunlight/`.

Open-source release of XRay (our first web transparency system), 2014. `http://xray.cs.columbia.edu`.

Open-source release of Pebbles (an object-level protection system for persistent data), 2014. `https://github.com/columbia/pebbles_platform_dalvik`.

Open-source release of Synapse (a heterogeneous-database integration system), 2013. `https://github.com/nviennot/synapse`.

Open-source release of Vanish (self-destructing data system), 2009. `http://vanish.cs.washington.edu/`.

Tech Transfers

Tech transfer of Synapse to Crowdtap, a NYC-based startup, 2013. The system has been running in production for two years with ≈650K users.

Tech transfer of security measures against Sybil attacks in a commercial, giant-scale distributed hash table (DHT), 2010.

Funding

Awarded:

Principal Investigator for Alfred P. Sloan Fellowship, "Privacy in a Data-Driven World," $55,000, 2016-2018.

Principal Investigator for NSF SaTC, "Scalable Web Transparency: New Scientific Building Blocks, Tools, and Measurements to Tame the Data-Driven Web," $1,588,998, 2015-2019. Co-PI: Augustin Chaintreau.

Principal Investigator for Microsoft Faculty Fellowship, $200,000, 2014.

Principal Investigator for Microsoft Research gift, $15,000, 2014.

Principal Investigator for NSF CAREER award, "New Operating Systems Abstractions for Responsible Data Management," $499,999, 2014-2019.

Principal Investigator for Google Faculty Fellowship, "Promiscuous: Scalable, Consistent Firehose for Data-Driven Web Service Integrations," $79,807, 2013-2014. Co-PI: Jason Nieh.

Principal Investigator for Columbia Provost's Grant for Junior Faculty Who Contribute to the Diversity Goals of the University, "CleanOS: Limiting Sensitive Data Exposure in Mobile Operating Systems," $25,000, 2013-2014.

Principal Investigator for DARPA Contract No. FA8650-11-C-7190, "MEERKATS: Maintaining EnterprisE Resiliency via Kaleidoscopic Adaptation & Transformation of Software Services," $6,619,270, 2011-2015. Co-PIs: Angelos Keromytis (was original PI), Salvatore Stolfo, Simha Sethumadhavan, Junfeng Yang, Matthew Elder, and Angelos Stavrou.

External Talks

"Privacy in a Data-Driven World." Hearst Corporation, 2016.

"Privacy in a Data-Driven World." Harvard University, 2016.

"Privacy in a Data-Driven World." MIT CSAIL, 2016.

"Privacy in a Data-Driven World." New York City Media Lab, 2016.

"Privacy in a Data-Driven World." Innovation and the Value of Privacy Conference, Columbia Business School, 2016.

"Web Transparency at Scale." Federal Trade Comission (FTC) PrivacyCon, FTC, 2016.

"Privacy in a Data-Driven World." Keynote at the Neural Information Processing Systems (NIPS) workshop on Learning Systems, NIPS, 2015.

"Privacy in a Data-Driven World." TwoSigma, 2015.

"Privacy in a Data-Driven World." Stanford's computer security seminar, 2015.

"Privacy in a Data-Driven World." Berkeley's AMPLab seminar, 2015.

"Increasing Privacy in a Data-Driven World." Panelist talk at National Academies Workshop on Privacy for the Intelligence Community, 2015. Attendees included members from the Intelligence Community and privacy experts who discussed how emerging technologies challenge the Intelligence Community and its ability to manage citizen's privacy.

"Transparency Infrastructures for the Data-Driven Web." Invited talk at the Federal Trade Commission, 2015. Attendees included one of the Commissioners, her staff, and other commissioners' staff.

"Synapse: A Microservices Architecture for Heterogeneous-Database Web Applications." Invited talk at the Workshop on Cloud Programmability co-located with the Microsoft Faculty Summit, 2015.

"Increasing Privacy in a Data-Driven World." Microsoft Research NYC, 2015.

"Transparency in a Data-Driven World." Invited talk for NSF informational session on Capitol Hill, 2014. Attendees included members of the Cybersecurity Caucus of the House of Representatives.

"Toward a Transparent Web." Panelist talk for the "Princeton Web Transparency Conference," 2014.

"Toward a Transparent Web." Keynote at the Diversity Workshop co-located with OSDI, 2014.

"New Abstractions for Responsible Big-Data Management." Invited speaker at the DIMACS Workshop on Secure Cloud Computing, 2014.

"Increasing Privacy in a Data-Driven World." Microsoft Faculty Fellowship final competition, 2014.

"New Abstractions for Responsible Big-Data Management." Microsoft Research, 2013.

"Regaining Control over Mobile and Cloud Data." Cloud Computing Security Forum, part of the IEEE Global Communications Conference (Globecom), 2011.

"Regaining Control over Mobile and Cloud Data." Invited talk delivered at universities and industrial labs: AT&T Labs NYC, Brown University, Carnegie Mellon University, Columbia University, Cornell University, Duke University, Georgia Institute of Technology, Google, Harvard University, IBM Research, Intel Corporation, Massachussetts Institute of Technology (MIT), Microsoft Research, New York University, Symantec Research Labs, University of California at Los Angeles, University of Southern California, 2011-2012.

"Self-destructing Data and Beyond." Invited talk at the University of British Columbia Systems Colloquium, 2010.

"Vanish: Increasing Data Privacy with Self-destructing Data." Invited talk at the Google Graduate Student Forum, 2010.

Media Coverage

The data republic, "To safeguard democracy, the use of data should be made as transparent as possible," The Economist, 2016.

Priya Kumar, "When Was the Last Time You Read a Privacy Policy?" Slate.com, 2016.

Ben Johnson, Codebreaker episode #7 on National Public Radio (NPR) Tech Marketplace, 2016.

Tom Simonite, "Probing the Dark Side of Google's Ad-Targeting System," MIT Technology Review, 2015.

Jim Dwyer, "The Big Bang of Social Networking," The New York Times, 2014.

Steve Lohr, "XRay: A New Tool for Tracking the Use of Personal Data on the Web," The New York Times, 2014.

Leonard Lopate, "Two of 'The Brilliant 10' Scientists," The Leonard Lopate Show on WYNC, New York City's branch of NPR, 2014.

Bob Brown, "5 Cool Cloud Computing Research Projects," Network World, 2009.

John Markoff, "New Technology to Make Digital Data Self-Destruct," The New York Times, 2009.

Martin Kaste, "Digital Data Make For A Really Permanent Record," National Public Radio, The End of Privacy Series, 2009.

David Lee, "This Website Will Self-destruct...," BBC Digital Planet, 2009.

"This Message Will Self-destruct," The Economist, 2009.

SERVICE ACTIVITIES

Research Community Service

Co-organizer of ISAT Workshop "The Future of Storage" on identifying break-through technologies on storage and data selectivity, 2016.

Co-organizer of ISAT Workshop "Whither the Data" on understanding complex flows in data ecosystems, 2016.

Member of Columbia's new Northeast Big-Data Hub, an NSF center aimed at organizing a Northeast research community around big data, 2015-present.

Chair of Poster Session for OSDI, 2014.

Chair of Poster Session for EuroSys, 2013.

Review Committee for the 2013 EuroSys Roger Needham Ph.D. Award, 2013.

NSF Panel for Secure and Trustworthy Computing, 2014.

NSF Panel for Computer Systems Research, 2012.

Program Committees:

ACM Symposium on Operating Systems Principles (SOSP), 2017.

Grace Hopper Celebration of Women in Computing Workshop (Grace Hopper), 2017.

ACM Workshop on Hot Topics in Operating Systems (HotOS), 2017.

IEEE Security and Privacy (S&P), 2017.

Workshop on Technology and Consumer Protection (co-organized by the FTC), 2017.

Workshop on Data and Algorithmic Transparency (DAT), 2016.

USENIX Operating Systems Design and Implementation Conference (OSDI), 2016.

Hot Topics in Mobile Computing (HotMobile), 2016.

European Conference on Computer Systems (EuroSys), 2016.

International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2016.

USENIX Security Symposium, 2015.

ACM Symposium on Cloud Computting (SoCC), 2015.

European Conference on Computer Systems (EuroSys), 2015.

USENIX Operating Systems Design and Implementation Conference (OSDI), 2014.

ACM Cloud Computing Security Workshop (CCSW), 2013.

ACM Symposium on Cloud Computing (SoCC), 2013.

USENIX Security Symposium, 2013.

Workshop on Hot Topics in Operating Systems (HotOS), 2013.

Workshop on Mobile Computing Systems and Applications (HotMobile), 2013.

European Conference on Computer Systems (EuroSys), 2013.

USENIX Operating Systems Design and Implementation (OSDI), 2012.

USENIX Security Symposium, 2012.

USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2011.

Department and School Service

Computer Science Department Committees:

Ph.D. Fellowship committee, 2012-2016.

Faculty Search committee, 2014, 2015, 2016.

Master's Admissions committee, 2013-2016.

Space committee, 2014-2016.

Master's Systems Track advisor, 2013-2016.

Columbia and SEAS Committees:

Facilitator for the SEAS Strategic Discussion Forum, Communications, Information, and Cybersecurity panel, 2015.

Columbia IT facilities committee, 2014, 2015.

Columbia Data Science Institute (DSI) Cybersecurity Committee, 2014, 2015.

Faculty advisor on Columbia's Egleston Scholar mentorship program, 2013.

Outreach Activities on Behalf of SEAS/Columbia:

Panelist at the 2016 Global Digital Futures Policy Forum, Columbia School of International and Public Affairs (SIPA). Invited to discuss the potential and pitfalls of an algorithmic society, 2016.

"Privacy in a Data-Driven World." Invited speaker at Columbia's NSF IGERT interdisciplinary course "From Data to Solutions," 2016.

"Privacy in a Data-Driven World." Invited speaker at joint event organized by the Data Science Institute and Columbia Business School's Leadership and Ethics center, 2016.

Organize hands-on programming workshop for the Annual Engineering Exploration event organized by the Society of Women Engineers for New York City highschool female students, 2014, 2015, planned for 2016. Participants include 23-25 highschool students from all five boroughs of New York City.

"Increasing Privacy in a Data-Driven World." Columbia Womensphere Innovation Summit organized by the Womensphere Foundation and Columbia Graduate Society of Women Engineers, 2015.

"Increasing Privacy in a Data-Driven World." Columbia Undergraduate Scholars Program, 2015.

"Toward a Transparent Web." Talk for Data Science Institute's industrial affiliates program, delivered for Bloomberg, 2014.

"Responsible Big-Data Management." Journalism Security Seminar organized by Columbia's Journalism School, 2013.

Panelist for New York City Girls Computer Science and Engineering Conference, 2012.

"Research and Education at Columbia's CS." Department host talk at Columbia's Engineering Women's Forum, 2012, 2013.

"Cloud Computing: Benefits and Challenges." Expert talk at Columbia Senate Information Technology Committee, 2011.

EDUCATION ACTIVITIES

Teaching

(All Columbia courses are new additions to its curriculum.)

Co-Instructor for Computer Systems for Big Data, Master's course for the Data Sciences Institute, Columbia University, Spring 2016. Enrollment: 79, course scores not found.

Instructor for Advanced Distributed Systems, graduate Computer Science course, Columbia University, Fall 2015. Enrollment: 14, overall instructor score: 3.6/5.

Instructor for Advanced Distributed Systems, graduate Computer Science course, Columbia University, Spring 2015. Enrollment: 21, overall instructor score: 4.4/5.

Co-Instructor for Computer Systems for Big Data, Master's course for the Data Sciences Institute, Columbia University, Spring 2015. Enrollment: 18, overall instructor score: 3.9/5.

Instructor for Distributed Systems Fundamentals, undergraduate Computer Science course, Columbia University, Fall 2014. Enrollment: 41, overall instructor score: 3.7/5.

Instructor for Cloud and Mobile Challenges Seminar, graduate Computer Science course, Columbia University, Spring 2014. Enrollment: 24, overall instructor score: 4.2/5.

Instructor for Distributed Systems Fundamentals, undergraduate Computer Science course, Columbia University, Fall 2013. Enrollment: 16, overall instructor score: 4.0/5.

Instructor for Cloud and Mobile Challenges Seminar, graduate Computer Science course, Columbia University, Spring 2013. Enrollment: 24, overall instructor course: 4.3/5.

Instructor for Distributed Systems Fundamentals, undergraduate Computer Science course, Columbia University, Fall 2012. Enrollment: 16, overall instructor score: 4.2/5.

Instructor for Cloud and Mobile Challenges Seminar, graduate Computer Science course, Columbia University, Fall 2011. Enrollment: 23, overall instructor score: not found.

Teaching assistant for Operating Systems I, undergraduate Computer Science course, University of Washington, Fall 2009.

Teaching assistant for Programming Languages for Non-majors, undergraduate course for non-Computer Science majors, University of Washington, Fall 2005.

Advising

(Students are from Columbia's Computer Science Department unless noted otherwise.)

In-Progress Ph.D. Students:

Vaggelis Atlidakis, started Ph.D. in 2013.

Mathias Lecuyer, started Ph.D. in 2013.

Riley Spahn, started Ph.D. in 2013.

Dissertation Committees:

Christoffer Dall, Ph.D. Computer Science dissetation committee, February 2017.

Yuanzhong Xu, Ph.D. Computer Science dissertation committee, University of Texas, May 2016.

Jonathan Bell, Ph.D. Computer Science dissertation committee, April 2016.

George Argyros, Ph.D. Computer Science candidacy committee, March 2016.

Nicolas Viennot, Ph.D. Computer Science dissertation committee, January 2016.

Yoshihisa Abe, Ph.D. Computer Science dissertation committee, Carnegie Mellon University, December 2015.

Vasileios Kemerlis, Ph.D. Computer Science dissertation committee, August 2015.

Jeremy Andrus, Ph.D. Computer Science dissertation committee, May 2015.

Kangkook Jee, Ph.D. Computer Science dissertation committee, 2015.

Nathaniel Boggs, Ph.D. Computer Science dissertation committee, 2015.

Binh Vo, Ph.D. Computer Science dissertation committee, 2015.

Heming Cui, Ph.D. Computer Science dissertation committee, 2014.

Marcin Szczodrak, Ph.D. Computer Science dissertation committee, 2014.

Raghavan Santhanam, M.S. Computer Science dissertation committee, 2014.

Jae Woo Lee, Ph.D. Computer Science dissertation committee, 2013.