Eleni Drinea

Data Science Institute
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Education	Harvard University	Cambridge, MA

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Harvard University   Cambridge, MA
School of Engineering and Applied Sciences
M.Sc. in Computer Science; Nov 2005
Ph.D. in Computer Science; Nov 2005
Thesis: "Lower Bounds for the Capacity of Channels with Deletions and Insertions"
Advisor: Prof. Michael Mitzenmacher

University of Patras   Patras, Greece
Computer Engineering and Informatics Department
B.S./M.S. in Computer Engineering and Informatics; June 1999.
Honors Graduate (2nd out of 120)
Thesis: "Randomized Algorithms and Applications"
Advisor: Prof. Paul Spirakis

**Work
Experience**

Columbia University   New York, NY
Lecturer in Discipline, 2014–present.

Lecturer in the discipline of Computer Science; graduate student advisor for Data Science.

EPFL   Lausanne, Switzerland
Research Associate, 2007–2009.

Research focused on reliable communication over realistic wireless networks, using randomized online algorithms, approximation techniques and the network coding paradigm.

New England Complex Systems Insitute (NECSI)   Cambridge, MA
Researcher, 2006–2007.

Research centered on using an information theory perspective to analyze data on communication channels between physicians and pharmacists.

Harvard University   Cambridge, MA
Research Assistant, 2000–2005.

Coursework included efficient algorithms, algorithms for massive data sets, cryptography, complexity theory, coding theory and graphics.

**Teaching
Experience**

Analysis of Algorithms, I (CSOR W4231.002)   Columbia University
Instructor, Spring 2015, 2016, 2017, 2018, 2019 (also, Summer 2015, 2016, 2017, 2018).

Masters-level course on fundamental topics in the design and analysis of efficient algorithms. Conducting two weekly lectures (total duration: 2.5 hours) to a class of Masters, PhD and qualified undergraduate students; minimum class size: 75 (S'17); maximum class size: 105 (S'15). Responsible for developing the syllabus, lecture notes, homework assignments and exams. Managing five teaching assistants.

Data Science Capstone and Ethics (ENGI 4800)   Columbia University
Instructor, Fall 2015, 2016, 2017, 2018

Masters-level course focusing on a semester-length data science project sponsored by a company. Responsible for developing the syllabus, organizing weekly lectures on relevant technologies, monitoring the progress of the projects (including weekly advising, reading reports and meetings with the sponsors) for a class of Masters in Data Science students; minimum class size: 13 (F'14); maximum class size: 110 (F'17).

Algorithms for Data Science (CSOR W4246, Sections 1 and 2)   Columbia University
Instructor, Fall 2014, 2015, 2016, 2017, 2018

Masters-level course on fundamental algorithms for data science. Conducting four weekly lectures (total

duration: 5 hours) to two sections of Masters and PhD students from various disciplines (primarily Data Science and Statistics); minimum class size: 75 (F'14); maximum class size: 320 (F'17). Responsible for developing the syllabus, lecture notes, homework assignments and exams. Managing seven teaching assistants.

Field Work (COMS E6910.033)   Columbia University
Instructor, 2015, 2016, 2017, 2018 (all semesters).

Grading curriculum practical training reports for Masters in Data Science students who do internships as part of their program of study.

Graph Theory and Applications   EPFL, Switzerland
Head Teaching Assistant, Spring 2008. Prof. Christina Fragouli.

Undergraduate course. Conducted a weekly two-hour section to a class of 20 on graph theory and applications. Developed and graded homework assignments and exams, conducted class-wide review sessions before exams, managed one teaching assistant.

Data Structures and Algorithms (CS 124)   Harvard University
Teaching Assistant, Spring 2000, Spring 2006. Prof. Michael Mitzenmacher.

Undergraduate course. Conducted one-hour weekly sections to teach a group of 12 the design and analysis of efficient algorithms and data structures. Held office hours, graded homework assignments and exams.

Data Structures and Algorithms (CSCI–E124)   Harvard Extension School
Teaching Assistant, Spring 2006. Prof. Michael Mitzenmacher.

Online version of the previous course with a slightly modified syllabus to suit a more general audience. Conducted one-hour weekly video-taped sections for a class of 50, graded assignments and exams.

Graph Theory and Combinatorics (AM 107)   Harvard University
Teaching Assistant, Spring 2001. Prof. Leslie Valiant.
Teaching Assistant, Spring 2006. Prof. Dan Gutfreund.

Undergraduate course. Conducted one-hour weekly sections on topics taken from graph theory, enumeration techniques, combinatorial algorithms and discrete probability. Developed and graded homework assignments and exams; conducted class-wide review sessions before exams.

Security, Privacy and Usability (CSCI–E170)   Harvard Extension School
Teaching Assistant, Fall 2005. Prof. Simon Garfinkel.

Online graduate course discussing computer security for desktop computing, networks and handheld devices. Addressed online questions during the weekly live streams, graded the final research projects.

Algorithms at the End of the Wire (CS 222)   Harvard University
Teaching Assistant, Spring 2004. Prof. Michael Mitzenmacher.

Graduate course on algorithms for big data, especially over networks, covering information retrieval, compression, coding and cryptography. Assisted with final project developments.

Algorithms at the End of the Wire (CSCI–E222)   Harvard Extension School
Teaching Assistant, Spring 2004. Prof. Michael Mitzenmacher.

Online version of the previous course. Substituted for half of the two-hour weekly video-taped lectures, graded homework assignments and exams.

Cryptography: Trust and Adversity (CS 220r)   Harvard University
Teaching Assistant, Fall 2000. Prof. Michael Rabin.

Graduate course covering topics in modern cryptography. Substituted for lectures, graded homework assignments and exams; conducted class-wide review sessions before exams.

Honors and Awards	Distinguished Faculty Teaching Award by the Columbia Engineering Alumni Association, April 2019. Kao Fellowship, "For students of very high promise in the Division of Engineering and Applied Sciences", Harvard University; September 2000–August 2001. Harvard University Fellowship, Harvard University; September 1999–May 2000. Academic Performance Award, Technical Chamber of Greece; June 1999.

Publications   *Journals*

[1] Eleni Drinea, Lorenzo Keller, and Christina Fragouli. Real–time delay with network coding and feedback. *Journal of Physical Communication*, 6(3):100–113, 2013. Invited article.

[2] Adam Kirsch and Eleni Drinea. Directly lower bounding the information capacity for channels with i.i.d. deletions and duplications. *IEEE Transactions on Information Theory (ToIT)*, 56(1):86–102, 2010.

[3] Eleni Drinea and Michael Mitzenmacher. Improved lower bounds for channels with i.i.d. deletions and insertions. *IEEE Transactions on Information Theory (ToIT)*, 53(8):2693–2714, 2007.

[4] Michael Mitzenmacher and Eleni Drinea. A simple lower bound for the capacity of the deletion channel. *IEEE Transactions on Information Theory (ToIT)*, 52(10):4657–4660, 2006.

[5] Eleni Drinea and Michael Mitzenmacher. On lower bounds for the capacity of i.i.d. deletion channels. *IEEE Transactions on Information Theory (ToIT)*, 52(10):4648–4657, 2006.

[6] Petros Drineas, Eleni Drinea, and Patrick Huggins. An experimental evaluation of a Monte-Carlo algorithm for singular value decomposition. *Y. Manolopoulos et. al. (Eds.): Revised Selected Papers from the 8th Panhellenic Conference on Informatics, Lecture Notes in Computer Science (LNCS)*, 2563:279–296, 2003.

Conferences

[1] Eleni Drinea, Lorenzo Keller, and Christina Fragouli. Delay with network coding and feedback. In *Proceedings of the IEEE International Symposium on Information Theory (ISIT), Vol. 2*, pages 844–848, 2009.

[2] Eleni Drinea and Adam Kirsch. Directly lower bounding the information capacity for channels with i.i.d. deletions and duplications. In *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, pages 1731–1735, 2007.

[3] Eleni Drinea and Michael Mitzenmacher. Improved lower bounds for channels with i.i.d. deletions and insertions. In *Proceedings of the 42nd Annual Allerton Conference on Communication, Control and Computing*, 2004. Invited paper.

[4] Eleni Drinea and Michael Mitzenmacher. On lower bounds for the capacity of deletion channels. In *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, page 227, 2004.

[5] Eleni Drinea, Alan Frieze, and Michael Mitzenmacher. Balls and bins models with feedback. In *Proceedings of the 11th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 308–315, 2002.

[6] Eleni Drinea, Petros Drineas, and Patrick Huggins. An experimental evaluation of a Monte-Carlo algorithm for singular value decomposition. In *Proceedings of the 8th Panhellenic Conference on Informatics (PCI)*, pages 278–288s, 2001.

Technical Reports

[1] Lorenzo Keller, Eleni Drinea, and Christina Fragouli. Online broadcasting with network coding. In *Proceedings of the Fourth Workshop on Network Coding, Theory and Applications (NetCod)*, 2008. Citations: 74.

[2] Eleni Drinea, Mihaela Enachescu, and Michael Mitzenmacher. Variations on random graph models for the Web. In *Harvard Computer Science Technical Report TR-06-01*, 2001. Available at ftp://ftp.deas.harvard.edu/techreports/tr-2001.html. Citations: 60.

Invited Talks   *Departmental Seminars*

[1] Lower bounds for the capacity of the binary deletion channel. *Institute for Data Sciences and Engineering, Columbia University*, March 2014.

[2] Lower bounds for the capacity of the deletion channel. *Theory seminar, EPFL, Lausanne, Switzerland*, February 2007.

[3] Lower bounds for the capacity of the deletion channel. *Laboratory of Networking and Information Systems seminar, Boston University, Boston MA*, June 2006.

[4] Balls and bins models with feedback and applications. *Computer Science Theory seminar, Rensselaer Polytechnic Institute, Troy NY*, November 2004.

[5] Balls and bins models with feedback and applications. *Computer Science Theory colloquium, University of Patras, Patras, Greece*, May 2003.

Workshop Participation

[1] Delay in broadcasting with network coding and feedback. *Young European Queueing Theorists (YEQT) Workshop on "Stochastic Analysis of Modern Communication Networks", EURANDOM, Eindhoven, Netherlands*, December 1–3, 2008.

[2] Delay in broadcasting with network coding and feedback. *3rd Athens Colloquium on Algorithms and Complexity (ACAC 08), University of Athens, Athens, Greece*, August 25–26, 2008.

Professional Service

Peer Reviewing

Journals: IEEE Transactions on Information Theory; IEEE Transactions on Communications; IEEE Transactions on Wireless Communications; SIAM Journal on Optimization; Information Processing Letters; IEEE/ACM Transactions on Networking.

Conferences: IEEE Annual Symposium on Foundations of Computer Science (FOCS); ACM Symposium on the Theory of Computing (STOC); ACM/SIAM Symposium on Discrete Algorithms (SODA); European Symposium on Algorithms (ESA); International Symposium on Theoretical Aspects of Computer Science (STACS); International Workshop on Randomization and Computation (RANDOM); IEEE International Symposium on Information Theory (ISIT); IEEE International Conference on Communications (ICC) Communication Theory Symposium; ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc).

Professional Society Memberships

Information Theory Society (ITSOC)
Institute of Electrical and Electronics Engineers (IEEE)
Association for Computing Machinery (ACM)

Languages

Greek (native), English (fluent), French (fluent), German (basic).