

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
School of Engineering Faculty Personnel Record

Date: September 2017

Name: Muriel Médard
 Department: Electrical Engineering
 Leongand Computer Science

1. Education:

<u>School</u>	<u>Degree</u>	<u>Date</u>
MIT	Bachelor of Science in Electrical Engineering	1989
MIT	Bachelor of Science in Mathematics	1989
MIT	Master of Science in Electrical Engineering	1991
MIT	Bachelor of Science in Humanities (Russian Studies)	1991
MIT	Doctor of Science in Electrical Engineering (minor in Management)	1995

2. Non-MIT experience:

<u>Employer</u>	<u>Position</u>	<u>Beginning</u>	<u>Ending</u>
University of Illinois Urbana-Champaign	Assistant Professor	August 1998	December 1999
NYNEX Science & Technology	Intern/consultant	June 1989	December 1989

3. History of MIT Appointments:

<u>Rank</u>	<u>Beginning</u>	<u>Ending</u>
MIT Lincoln Laboratory Staff Member	September 1995	June 1998
Assistant Professor	January 2000	January 2003
Associate Professor (without tenure)	January 2003	May 2005
Associate Professor (with tenure)	May 2005	May 2008
Professor	May 2008	
Cecil H. Green Professor	April 2014	

4.

Consulting Record:

<u>Firm</u>	<u>Beginning</u>	<u>Ending</u>
NYNEX Science and Technology	September 1989	December 1989
Sycamore Networks	March 2000	June 2000
Pebbles Technologies/Malachite Technologies	June 2000	January 2004
Vanu Incorporated	June 2002	September 2003
Blackwave	July 2008	August 2009
MIT Lincoln Laboratory	October 2009	present
AT&T	March 2010	January 2011
Steinwurf	October 2011	
CodeOn	November 2011	

Fried, Frank, Harris, Shriver & Jacobson LLP	Summer 2012	Summer 2013
Patterson, Belknap, Webb & Tyler LLP	Summer 2015	

5. Department and Institute Committees, Other Assigned Duties:

<u>Activity</u>	<u>Beginning</u>	<u>Ending</u>
Graduate Counselor (Dept)	2000	present
Graduate Admissions Reader (Dept) (domestic and international, for different years: Africa and Australia; Korea; China and Taiwan; France)	2000	present
House Fellow, Green Hall (Institute)	2001	2002
Associate House Master, Simmons Hall (Institute)	2002	2006
Undergraduate Admissions Reader (Institute)	2004, 2009	
Organized "Meet Course VI" outreach event (Department)	2003, 2008	
Lemelson Prize Committee (Institute)	2000	
Sprowls Award Committee (Department)	2003, 2005	
Baker Housemaster Search Committee (Institute)	2004	
EECS Graduate Admissions Coordinator for Areas I and VII (Department)	2004 2007	2005 2008
EECS Graduate Admissions Co-Coordinator for Area I (Department)	2005	present
Search Committee Member (Department)	2006-2007, 2011-2014	
Simmons Hall Associate Housemaster Search Committee (Institute)	2005	2006
Associate Director, Laboratory for Information and Decision Systems (Institute)	2005	2007
Next House Housemaster (Institute)	2006	2008
Member of the Committee on Student Life (Institute)	2006	2010
Member of the Search Committee for the Dean for Student Life (Institute)	2007	2008
Member of the Committee on Outside Professional Activities (Institute)	2007	2010
Dean for Undergraduate Education Faculty Advisory Committee (Institute)	Spring 2008	
Member of the Institute Committee on Intellectual Property (Institute)	2010	present
Chair of the Committee on Student Life (Institute)	2010	2010
Co-chair of the Student Life Committee of the Institute Task Force (Institute)	2009	2011
Co-chair Student Engagement Committee (Institute)	2009	2010
Research Laboratory of Electronics Advisory Committee/ now Steering Committee (Laboratory)	2009	present
Co-chair Graduate Student Experience Committee (Department)	2011	2012
Co-chair Visiting Student Fee Committee (Institute)	2011	2012
Steering Committee Member MIT Dalai Lama Center for Ethics (Institute)	2010	present

Member of the Martin Luther King Visiting Scholars Steering Committee	2013	present
Chair of the Faculty Committee on Planning (Institute)	2014	2017.
Member of the Institute Building Committee (Institute)	2014	2017
Co-chair of the Boole-Shannon Celebration (Institute)	2015	2016
Member of EECS Department Chair Search Committee (Institute)		2016
Member of the RLE Director Search Committee (Institute)		2016
Member of EECS Department Chair Search Committee (Institute)		2017.

6. Professional Service:

<u>Activity</u>	<u>Beginning</u>	<u>Ending</u>
Program Committee Member for International Society for Optical Engineering (SPIE), Conference on Computer and Network Security	1996	1997
Co-organizer of session for Miniconference on Information Theory at the 1999 International Conference on Communications	1998	1999
Co-organizer of the new optical networking track for the Allerton Conference on Communication, Control, and Computing	1998	2003
Associate Editor for Networks, Journal of Optical Networks of the Optical Society of America	2001	2002
Member of the Information Science and Technology (ISAT) study group for DARPA on "Robust Networks for Critical Missions and Critical Infrastructure"	2002	2002
Organizer of the Optical Networks session for the 17 th IEEE Computer Communications Workshop	2002	2002
Technical Program Committee member for the High Speed Networking Conference, 2002	2001	2002
Technical Program Committee member for the IEEE International Symposium on Information Theory	2004, 2006, 2010, 2014, 2015	
Session Organizer, Wireless Communications and Networking Conference, 2003	2002	2002
Technical Program Committee member for the International Workshop on Design of Reliable Communication Networks (DCRN) 2003 (IEEE)	2002	2003
Technical Program Committee member for ITCOM 2003 (SPIE)	2002	2003
Guest Editor, IEEE Journal of Lightwave Technology Special Issue on Optical Networks	2002	2003
NSF review panelist	2002	present
Co-organizer of the new network coding track for the Allerton Conference on Communication, Control, and Computing	2003	2006
Program Committee Member, 2003 International Workshop on Optical Networks Control and Management (ONCM'03) (in conjunction with the 32nd International Conference on Parallel Processing)	2003	2003

Associate Editor, Optical Communications and Networking Series of the IEEE Journal on Selected Areas in Communications	2003	2007
Technical Program Committee Member, 2004 International Workshop on Wireless Ad-hoc Networks (IWWAN)	2003	2004
Associate Editor, Communications, for the IEEE Transactions on Information Theory	2003	2006
Treasurer, IEEE Information Theory Society	2004	2007
Co-organizer of an invited session on Network Coding for the 38th Annual Conference on Information Sciences and Systems, Princeton University	2003	2004
Co-organizer of an invited session on Network Coding for the Communication Theory Workshop	2003	2004
Member of the Information Science and Technology (ISAT), an advisory group to DARPA	2003	2006
Technical Program Committee member for Globecom 2004 Workshop on GMPLS	2004	2004
Technical Program Committee Member for the 2004 Information Theory Workshop	2003	2004
Technical Program Committee Member, 2005 International Workshop on Wireless Ad-hoc Networks (IWWAN)	2004	2005
Guest Editor, Joint Special Issue of the IEEE Transactions on Information Theory and the IEEE/ACM Transactions on Networking on Networking and Information Theory	2004	2006
Technical Program Committee Member, Symposium on Information Theory of Wireless Networks, as part of IEEE WirelessCom 2005	2004	2005
Technical Program Committee member for the International Workshop on Design of Reliable Communication Networks (DCRN) 2005 (IEEE)	2004	2005
Technical Program Committee member for Broadnets 2005	2005	2005
Co-chair of Netcod 2006 (Second Workshop on Network Coding, Theory, and Applications) in combination with WiOpt	2005	2006
Technical Program Committee member for the 2006 Information Theory Workshop	2005	2006
Session Organizer for the 2006 International Zurich Seminar on Communications (IZS)	2005	2006
Technical Program Committee member for the 2006 IEEE International Conference on Ultra Wideband (ICUWB)	2005	2006
Technical Program Committee Co-Chair for the 2007 IEEE International Symposium on Information Theory	2005	2007
Optics East 2006 ITCOM Technical Program, Committee Member	2005	2006
TPC member (PIMRC '06)	2006	2006
IEEE Alexander Graham Bell Medal Committee	2006	2015
Invited Session organizer for INFORMS 2006	2006	2006
Co-organizer of the Network Optimization track for the	2006	2006

Allerton Conference on Communication, Control, and Computing		
Technical Program Committee Member RAWNET 2007,	2006	2007
Member of the Board of Governors for the IEEE Information Theory Society	2004	2014
Associate Editor, IEEE Journal on Lightwave Communications	2007	2012
Technical Program Committee Member, INFOCOM 2008	2007	2008
Technical Program Committee Member International Symposium on Information Theory and its Applications	2007	2008
Audit Committee Member for the School Computer and Communication Sciences of Ecole polytechnique fédérale de (EPFL)	2007	2007
TPC Member ICC Optical Network Symposium	2007	2007
Tutorial co-chair PIMRC '08	2007	2008
Guest Editor in Chief IEEE Transactions on Information Forensics and Security: Special Issue on Statistical Methods for Network Security and Forensics	2007	2008
General co-chair, 2012 IEEE International Symposium on Information Theory	2008	2012
Technical program member, International Symposium on Information Theory and its Applications 2008	2008	2008
Technical program member, IEEE International Workshop on Wireless Network Coding 2009	2008	2009
Technical program co-chair for IEEE/IFIP WiOpt (International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks) 2009	2008	2009
Session organizer for the IEEE Information Theory Workshop 2009	2008	2009
Technical program member, DRCN 2009	2008	2009
Technical program member, IEEE WINC 2009	2009	2009
Technical program member, CoCoNets 2009	2009	2009
Technical program member, IEEE Globecom Communication Theory Workshop	2009	2009
Technical program member, Network Coding Workshop (Netcod)	2006, 2007, 2008, 2009, 2010, 2011, 2012, 2014, 2015	
Technical program member, ITW 2010	2009	2010
Technical program co-chair for ACM Conference on emerging Networking EXperiments and Technologies (ACM CoNEXT 2010)	2009	2010
Chair and founder, Outreach Committee IEEE Information Theory Society	2008	2009
Guest Editor, "Trading Rate for Delay at the Transport Layer", IEEE Journal on Selected Areas in Communications	2009	2011
Second Vice-President, IEEE Information Theory Society	2010	2011
Founding member, Green Touch	2010	2011
IEEE Hamming Medal Committee member	2010	2016

IEEE Joseph Lo Cicero Award Committee member	2010	2011
IEEE Donald W. McClellan Meritorious Service Award Committee member	2010	2011
Chair, IEEE Joint Information Theory and Communication Society Best Paper Award Committee	2010	2011
Awards Committee Member for IEEE Information Theory Society	2010	
Chair, IEEE Chapter Award Committee	2010	2010
IEEE Shannon Award Committee Member	2010, 2011	
TPC member, WiOpt 2011	2011	
TPC member, Valuetools 2011	2011	
TPC member, ITW 2011	2011	
Chair, IEEE Information Society Best Paper Award Committee	2011	
Chair, IEEE Rice Paper Award Committee	2011	
TPC member, Globecom Communication Theory Symposium 2011	2011	
TPC member, Globecom Optical Networking Symposium 2011	2011	
TPC member, ICC Communication Theory Symposium 2012	2011	2012
TPC member, ICC Optical Networking Symposium 2012	2011	2012
TPC member ICCCN 2011	2011	
First Vice-President, IEEE Society		2011
Member IEEE Information Theory Society Conference Committee	2011	2013
Member of Scientific Council of Digiteo	2011	2015
Guest Editor, "Special Issue on Network Coding and Applications", Physical Communication, Elsevier	2011	2012
Guest Editor, "In Network Computation", IEEE Journal on Selected Areas in Communications	2011	2013
TPC member, MILCOM Unclassified Programs Waveforms and Signal Processing Track	2011	2011
Member of the International Advisory Committee of CominLabs	2011	2016
IEEE Vehicular Technology Society Distinguished Lecturer	2011	present
Chair IEEE Joseph Lo Cicero Award Committee	2011	2011
Chair IEEE Information Theory Society Awards Committee	2011	2011
TPC member, Coconet 2012	2012	2012
President of IEEE Information Theory Society	2012	2012
Chair of the IEEE Claude E. Shannon Award Committee	2012	2012
Chair of the IEEE A. D. Wyner Distinguished Service Award	2012	2012
General co-chair IEEE International Symposium on Information Theory	2009	2012
General co-chair of Netcod 2012	2011	2012
IEEE Communications Society Tutorial Paper Paper Award Committee Member	2012	2012
Chair of the IEEE Leonard Abraham Prize Committee	2012	2012
Member, Information Theory Society External Nomination Committee	2012	2012
Member of the Editorial Board of Foundations and	2012	present

Trends on Communications and Information Theory		
Member of IEEE Bell Medal Committee	2012	present
Junior Past President, Information Theory Society	2013	2013
Chair of the Scientific Advisory Board,	2013	2015
Center of Competence for Future Cities at the University of Porto		
Member of the Steering Committee of the IEEE Transactions on Network Science and Engineering	2013	present
TPC Member of ITW 2014	2014	2014
TPC Member of PODC 2014	2014	
Chair of the IEEE Hamming Medal Committee	2013	2015
Editor-in-Chief, IEEE Journal on Selected Areas in Communications	2014	present
Technical co-chair Globecom Optical Networks and Systems Symposium 2014	2014	
Publicity Chair, Netcod 2015	2014	
MIT Martin Luther King Program Advisory Committee Member	2014	
TPC Member of MONAMI 2014	2014	
TPC Member of the Fourth International Castle Meeting on Coding Theory and Applications	2014	
Chair IEEE Information Theory Society Nominations and Appointment Committee	2014	
Member of the IEEE Founders Medal Committee	2014	present
IEEE Globecom Paper Award Committee	2015	
TPC Member of DRCN 2016	2015	
TPC Member of ISIT 2016	2016	
TPC Member of ITW 2016	2016	
Advisory Committee Netcod 2016	2016.	
Scientific Committee Castle Meeting on Coding Theory and Applications	2016	2017
TPC Co-Chair, WiOpt 2017	2017	
Chair of the IEEE Medals Council	2017	
Member of the IEEE Awards Board	2017	
Member of the IEEE Awards Board Operating Committee	2017	
Member of the IEEE Awards Board Awards Review Committee	2017	
Chair of the IEEE Bell Medal Committee	2016	2017
TPC Co-chair, WCNC 2019	2017	
NSF CISE Director Search Committee	2017.	

7. Awards Received:

<u>Award</u>	<u>Date</u>
NSF Career Award	2001
IEEE Leon K. Kirchmayer Prize Paper Award, presented by the IEEE Board of Directors for the most outstanding paper by an author(s) under 30 years of age, at the date of submission of the original manuscript M. Médard, "The Effect Upon Channel Capacity in Wireless Communications of Perfect and Imperfect Knowledge of the Channel,"	2002

<i>IEEE Transactions on Information Theory</i> , Vol. 46 Issue 3, May 2000, Pages: 935-946.	
Recipient of a 2003 Esther and Harold E. Edgerton MIT Chair	2002
Best Paper Award for the Fourth International Workshop on the Design of Reliable Communication Networks (DRCN) G. Weichenberg, V. Chan, M. Médard, “Reliable Architectures for Networks Under Stress,”	2003
Co-recipient of the Harold E. Edgerton Faculty Achievement Award, established in 1982 to honor junior faculty members “for distinction in research, teaching and service to the MIT community.”	2004
Recognized in 2004 as a Siemens “outstanding mentor” for my work with high school students in science and engineering	2004
Gilbreth Lectureship, National Academy of Engineering	2007
2009 IEEE Communications Society and Information Theory Society Joint Paper Award T. Ho, Médard, M., Koetter, R., Karger, D. R. Effros, M., Shi, J., and Leong, B., “A Random Linear Network Coding Approach to Multicast,” <i>IEEE Transactions on Information Theory</i> , vol. 52, no. 10, pp. 4413-4430, October 2006.	2009
2009 IEEE William R. Bennett Prize in the Field of Communications Networking, S. Katti, Rahul, H., Hu, W., Katabi, D., Médard, M., and Crowcroft, J., “XORs in the Air: Practical Wireless Network Coding”, <i>IEEE/ACM Transactions on Networking</i> , Volume 16, Issue 3, June 2008, pp. 497 – 510	2009
MIT EECS Faculty Research Innovation Fellowship	2011
Distinguished Lecturer, IEEE Vehicular Technology Society	2011-2018
Distinguished Lecturer, IEEE Information Theory Society	2013-2015
Netapp Faculty Fellow	2012, 2013, 2014
MIT EECS Graduate Student Association Mentor Award	2013
Best Paper Award for the ICC Wireless Communications Symposium, G. Angelopoulos, Paidimarri, A., Chandrakasan, A. P., and Médard, M., “Experimental Study of the Interplay of Channel and Network Coding in Low Power Sensor Applications”	2013
Best Paper Award for the International Conference on Mobile Networks and Management (MONAMI) 2013, M. Kim, Klein. T., Soljanin, E., Barros, J, and Médard, M., “Trade-off Between Cost and Goodput in Wireless: Replacing Transmitters with Coding”	2013
Best Paper Award for the IEEE International Symposium on Power Line Communications (ISPLC) 2014, J. Bilbao, Calvo A., Armendariz, I., Crespo, P., and Médard, M., “Reliable Communications with Network Coding in Narrowband Powerline Channel”	2014
Cecil H. and Ida Green Chair for EECS	2014-2019
Best Paper Award for the IEEE International Symposium on Network Computing and Applications (NCA14), V. Cadambe, Lynch, N., Médard, M., and Musial, P.,	2014

“A Coded Shared Atomic Memory Algorithm for Message Passing Architectures”.	
Named by Thomson Reuters as One of the World’s Most Influential Scientific Minds	2014
Best Paper Award for ICC	2015
Y. Cui, Médard, M., Yeh, E., Leith, D., and Duffy, K., “Optimization-Based Linear Network Coding for General Connections of Continuous Flows”	
Best Paper Award for ICC	2015
X. Chen, Jukan, A., and Médard M., “Linear Network Coding and Parallel Transmission Increase Fault Tolerance and Optical Reach”	
IEEE WICE (Women in Communication Engineering) Outstanding Achievement Award	2016
On the ACM inaugural list of “10 Women in Networking/Communications that You Should Know.”	2016
IEEE Vehicular Technology Society James Evans Avant Garde Award	2017
Best Paper award for SPACOMM 2017	2017
U. Speidel, Cocker, ‘E., Médard, M., Heide, J., and Vingelmann, P., “Topologies for the Provision of Network-Coded Services via Shared Satellite Channels”	
Aaron D. Wyner Distinguished Service Award of the IEEE Information Theory Society.	2017

8. Current Organization Membership:

<u>Organization</u>	<u>Offices Held</u>
IEEE Information Theory Society	Treasurer, 2004-2007 Member, Board of Governors, 2004-2014, Second Vice-President, 2010, First Vice-President 2011, President 2012, Junior Past President 2013, Senior Past President 2014
IEEE Communications Society	Editor-in-Chief, Journal on Selected Areas in Communications; Steering Committee Member on Transactions on Network Science
IEEE (Fellow)	
Eta Kappa Nu	
Tau Beta Pi	
Sigma Xi	

9. Patents and Patent Applications Pending:

1. M. Médard, S.G. Finn, R.A. Barry, R.G. Gallager., "Method and Apparatus for Automatic Protection Switching," US Patent 6,047,331
2. M. Médard, J. D. Moores, K. L. Hall, K. Rauschenbach, S. Parikh, A. H. Chan, "A Pseudorandom Noise Sequence Noise Generator," US Patent 6,201,870
3. R. Bergman, M. Médard, "Fault Isolation for Communication Networks for Isolating the Source of Faults Comprising Attacks, Failures, and Other Network Propagating Errors," US Patent 6,442,694
4. M. Médard, S.R. Chinn., "Method and Apparatus for Detecting Security Attacks in Communication Networks," US Patent 6,507,012 and 6,507,012 B1
5. M. Médard, S.R. Chinn., "Method and apparatus for detecting malfunctions in communication systems," US Patent 6,603,112
6. M. Médard, S.R. Chinn., "Method and apparatus for detecting malfunctions in communication systems", US Patent 6,727,490
7. S.G. Finn, M. Médard, R.A. Barry, "Method and apparatus for automatic protection switching", US Patent 6,728,205
8. M. Garofalo, G. Ciancaglini, M. Médard, J. Hart, "Multiple Switch Protected Architecture," US Patent 7,263,060
9. S. Chinn, G. Ciancaglini, M. Garofalo, J. Hart, S. Lumetta, M. Lupinacci, M. Médard, J. D. Moores, G. Oliveira, S. Parikh, M. Parquette. W. Proulx, D. Proulx, M. Rydeen, "An Integrated System and Method for Controlling Telecommunication Network Data Communicated over a Local Area Network and Storage Data Communicated over a Storage Area Network," US Patent 7,289,499
10. G. Ciancaglini, M. Garofalo, J. Hart, S. Lumetta, M. Médard, J. Moores, S. Parikh, M. Parquette, W. Proulx, M. Rydeen, "Fault Tolerant Optical Data Communication Network Having Auto Discovery," US Patent 7,406,029
11. D.S. Lun, M. Médard, T. Ho, R. Koetter, N. Ratnakar, "Minimum Cost Routing with Network Coding," US Patent 7,414,978
12. S. Lumetta, M. Médard, "Fault Tolerant Optical Data Communication Network," US Patent 7,603,033
13. G. Ciancaglini, S. Lumetta, M. Médard, J. Moores, S. Parikh, M. Parquette, " Multiple access protocol system and related techniques for multi-gigabit optical wavelength division multiplexed local area networks," US Patent 7,646,979
14. M. Médard, S. Ray, L. Zheng, "Fiber Aided Wireless Network Architecture," US Patent 7,684,709
15. T. Ho, R. Koetter, M. Médard, D. Karger, M. Effros, "Randomized Distributed Network Coding," US Patent 7,706,365
16. S. Deb, M. Médard, R. Koetter, "A Random Linear Coding Approach to Distributed Data Storage," US Patent 8,046,426
17. J.-K. Sundararajan, D. Shah, M. Médard, P. Sadeghi, "Feedback-based online network coding", US Patent 8,068,426
18. S. Deb, M. Médard, "A Network Coding Approach to Rapid Information Dissemination," US Patent 8,102,837
19. X. Shi, M. Médard, R. Koetter, N.A. Koetter, D.S. Lun, "Methods and Apparatus for Automated Base Calling on Multiple DNA Strands", US Patent 8,126,235
20. J.-K. Sundararajan, D. Shah, M. Médard, M. Mitzenmacher, J. Barros and S. Jakubczak "Method and Apparatus Providing Network Coding Based Flow Control", US Patent 8,130,776

21. D. Lucani, M. Médard, M. Stojanovic, "Random Linear Network Coding for Time Division Duplexing", US Patent 8,279,781
22. M. Médard, M. Aikens, L. M. Colon, J. Hurley, M. Kilian, M. McShane, M. Warres, R.W. Scheifler, "Arrangements and Methods for Access to Stored Data", US Patent 8,352,602
23. S. Deb, M. Médard, R. Koetter, "A Random Linear Coding Approach to Distributed Data Storage," US Patent 8,375,102
24. G. Angelopoulos, M. Medard, A. Chandrakasan, "Partial Packet Recovery in Wireless Networks", US Patent 8386892
25. D. Lucani, M. Médard, M. Stojanovic, "Random Linear Network Coding for Time Division Duplexing", US Patent 8,451,756
26. D. Lucani, M. Kim, F. Zhang, X. Shi, M. Médard, M.-J. Montpetit, "Network coding for multi-resolution multicast", US Patent 8,473,998
27. S. Feizi-Khankandi, M. Médard, "Method and Apparatus to Perform Functional Compression", US Patent 8,482,441
28. J.-K. Sundararajan, D. Shah, M. Médard, M. Mitzenmacher, J. Barros and S. Jakubczak "Method and Apparatus Providing Coding Based Flow Control", US Patent 8,526,451
29. L. Lima, S. Gheorghiu, J. Barros, M. Médard, A. Toledo, J. Vilela, "Secure Network Coding for Multi-Resolution Wireless Video Streaming", US Patent 8,571,214 B2, European Patent EP1173559.0
30. M. Kim, M. Médard, A. ParandehGheibi, "Coding Approach for a Robust and Flexible Communications Protocol", US Patent 8,780,693
31. M. Médard, M. Aikens, L. M. Colon, J. Hurley, M. Kilian, M. McShane, M. Warres, R.W. Scheifler, "Arrangements and Methods for Access to Stored Data", US Patent 8,812,671
32. N. Fawaz, M. Médard. "Peaky binning relaying scheme for wideband/low signal-to-noise ratio (SNR) wireless communications", US Patent 8,891,593
33. A. ParandehGheibi, M. Kim, M. Médard, "Advertisements as Keys for Streaming Protected Content", US Patent 8,918,902
34. U. Ferner, M. Médard, "Method And Apparatus To Reduce Access Time In A Data Storage Device Using Coded Seeking", US Patent 9,019,643
35. Haeupler, M. Médard, "Method And Apparatus For Performing Finite Memory Network Coding In An Arbitrary Network", US Patent 9,025,607
36. A. Hamedany, M. Warres, M. Médard, L. M. Colon, C. Losso, J. Hurley, "Resource Allocation and Modification Using Statistical Analysis", US Patent 9,066,141
37. L. Lima, S. Gheorghiu, J. Barros, M. Medard, A. Lopez Toledo, J. Vilela, "Secure Network Coding for Multi-Resolution Wireless Transmission", US Patent 9,137,49
38. L. M. Zeger, M. Medard, A. Rezaee,"Traffic backfilling via network coding in a multi-packet reception network", US Patent 9,143,274
39. M. Medard, A. Eryilmaz, A. Ozdaglar, Method for coding-based, delay-efficient data transmission,US Patent 9,160,440
40. M. Medard, X. Shi Xiaomeng, M. Montpetit, S. Teerapittayanon, K. Fouli, "Wireless reliability architecture and methods using network coding", US Patent 9,185,529
41. G. Angelopoulos, M. Medard, A. P. Chandrakasan, "Partial packet recovery in wireless networks", US Patent 9,203,441
42. M. Médard, X. Shi, M.-J. Montpetit, S. Teerapittayanon, K. Fouli, "Wireless Reliability Architecture and Methods Using Network-Coding", US Patent 9,271,123

43. M. Médard, X. Shi, M.-J. Montpetit, S. Teerapittayanon, K. Fouli, "Wireless Reliability Architecture and Methods Using Network-Coding", US Patent 9,253,608
44. S. Feizi-Khankandi, V. Goyal, M. Medard, "Energy-Efficient Time-Stampless Adaptive Nonuniform Sampling", US Patent 9,294,113
45. U. Ferner, M. Médard, "Coded Seeking Apparatus and Techniques for Data Retrieval", US Patent 9,361,936
46. L. M. Zeger, M. Medard, A. Rezaee, "Method and Apparatus For Reducing Feedback and Enhancing Message Dissemination Efficiency in a Multicast Network", US Patent 9,369,255
47. F. du Pin Calmon, W. Zeng, M. Médard, "Method and Apparatus for Implementing Distributed Content Caching In A Content Delivery Network", US Patent 9,369,541
48. F. du Pin Calmon, J. Cloud, M. Médard, W. Zeng, "Multi-path Data Transfer Using Network Coding", US Patent 9,537,759, also European Application
49. L. Zeger, J. Cloud, M. Médard, Joint Use Of Multi-Packet Reception And Network Coding For Performance Improvement", US Patent 9,544,126
50. L. Zeger , M. Médard, A. Rezaee, "Traffic Backfilling via Network Coding In A Multi-Packet Reception Network", US Patent 9,559,83
51. M. Médard, U. Ferner, T. Wang, "Network Coded Storage with Multi-resolution Codes", US Patent 9,607,003, also European, Japanese, Korean, Chinese Patent Applications
52. L. Zeger, M. Médard, A. Peters, "Method and apparatus for Efficient Transmission of Information to Multiple Nodes", US Patent Application 20130114611, notice of allowance received
53. G. Ciancaglini, M. Médard, J. D. Moores, M. R. Parquette, D. P. Proulx, "Method and Apparatus for Provisioning Connection Oriented, Quality of Service Capabilities and Services," US Patent application 20050089054
54. A. Hamedany, M. Warres, M. Médard, L. M. Colon, C. Losso, J. Hurley, "Resource Allocation and Modification Using Statistical Analysis", US Patent Application 20100185768
55. F. du Pin Calmon, J. Cloud, W. Zeng, M. Médard, "Multipath Data Transfer Using Network Coding", US Patent Application 20130195106; European Patent Application 13742964.3
56. F. du Pin Calmon, M. Médard, L. Zeger, M. Christiansen, K. Duffy, "Method and Apparatus for Secure Communication", US Patent Application 20160154970
57. L. Zeger, M. Médard, A. Randles, "Method and Apparatus for Packet Capture Using Preambles and Postambles", US Patent Application 20160157127
58. M. Médard, D. Shah, J.-K. Sundararajan, "ARQ for Network Coding", M.I.T. Case No. 13100
59. J. F. Cordeiro De Oliveira Barros, J. P. Da Silva Machado Garcia Vilela, M. Médard, L. M. Moya Praca De Araujo Lima "Systems and Methods for Providing Confidentiality in Network Coding", M.I.T. Case No. 13202
60. G. Angelopoulos, M. Médard, A. Chandrakasan, "An Alternative Approach to Hybrid ARQ Systems - Joint Channel and Network Coding", M.I.T. Case No. 15259
61. M. Christiansen, K. Duffy, F. du Pin Calmon, M. Médard, "Brute-Force Searching, the Typical Set and Guesswork", M.I.T. Case No. 16671J
62. H. Swaminathan, D.S. Lun, C. Grgicak, M. Médard, "Low-Temperature DNA Mixture Interpretation: Determining the number of contributors", M.I.T. Case No. 16949J
63. U. Ferner, M. Médard, "Method And Apparatus To Reduce Access Time In A Data Storage Device Using Coded Seeking", European, Japanese, Korean, Chinese Patent

Applications M.I.T. Case No. 16012

Educational Contributions of Muriel Médard

1. Teaching materials

- a) In 6.441, I developed in Latex an all new set of lecture handouts, completely re-designed the syllabus, developed a substantial set of supplementary readings of relevant research papers, organized by relevance to different topics and by difficulty, introduced a research project on major papers in the literature.
- b) In 6.263, in collaboration with Dina Katabi, I significantly revised the course, wrote new lecture handouts, in particular in the areas of the use of transforms in analyzing queuing systems, of switching theory, of rerouting, of wireless networks and coding (including network coding); introduced a research design project and reading of major papers in the area.
- c) In 6.989, I developed a new graduate course on network coding, with research projects from the students. Several of these projects evolved into publications.

2. Other educational contributions:

- a) Summer Professional Institute: co-instructor for Ini0S, Digital Communication Networks; significantly updated the curriculum. Co-instructor for 6.33S, Network Coding – created a new course with Dina Katabi.
- b) Developed a course on network coding in conjunction with the late Ralf Koetter of UIUC (later TUM), later expanded with Frank Fitzek of the University of Aalborg; the course was given at Centre for Wireless Communications at the University of Oulu, at the IEEE Global Telecommunications Conference (Globecom) in Dallas, at the International Symposium on Information Theory (ISIT) in Australia, at the International Workshop on Wireless and Ad Hoc Networks in New York, at the UCSD center for Information Theory and its Applications (ITA), at IFIP Networking in Atlanta, at the Workshop on Network Coding in Hong Kong, at the International Symposium on Personal, Indoor and Mobile Radio Communications in France, at Telecom Bretagne in France, at the European Wireless Conference in Aalborg, at ICC in Ottawa, Canada, as a Doctoral Course at the University of Modena in Italy, as a Doctoral Course at the University of Aalborg (three times), at ICC in Budapest, in Ottawa, in Australia, in London and at Digicosme (Supelec).
- c) I have supervised projects of undergraduates (UROPs), high school students and visiting graduate students, summarized as follows:
 - Chan, Serena, 6-A student at MIT Lincoln Laboratory, “Localization of Attacks in Optical Networks,” Summer 1997 and January 1998,
 - Lin, Alvin, “Computer Simulation of Algorithms for Creating Minimal weight Redundant Trees in Edge-Redundant Graphs”, project through the Research Science Institute, run by the Center for Excellence in Education, to encourage promising U.S. high school students to pursue careers in science and engineering, Summer 2000
 - Chan, Derrick, “Coding for ALOHA Systems,” 6.199 Advanced Undergraduate Project, Fall 2000
 - Divi, Vijay, “Heuristic Methods for Tree Selection,” UROP project, Spring 2001
 - Abdallah, Rami, “Error Probability in Wireless Channels,” project through the Research Science Institute, Summer 2001

Educational Contributions of Muriel Médard

Frey, Claudio, “Optimal Spreading Bandwidth in Ultrawideband Channels,” project through the Research Science Institute, Summer 2001

Tang, Jie, “Cycles in Large Networks,” project through the Research Science Institute (**project was semi-finalist in the Siemens-Westinghouse competition**), Summer 2003

Ryu, Ho Seung (Paul), “Distribution of Node Degrees in Large Networks,” project through the Research Science Institute (**project was semi-finalist at the Siemens-Westinghouse Competition**), Summer 2003

Bdeir, Ayah, “SNR adaptation for PSAM systems,” undergraduate visiting from American University of Beirut, Summer 2003

Fink, Evan, “Random Multicast Network Coding,” UROP project, Summer 2003

Lee, Anna, “Rate-Splitting Implementation of Slepian-Wolf Source Coding,” UROP project, Summer, Fall 2003 and Spring 2004

Choute, Clifford, “Network Coding in Gossip Networks,” UROP project, Spring 2004

Lee, Hyunjoo (Jenny), “Network Coding with a Cost Criterion,” AUP, Spring 2004

Muñoz-Torres, Enrique A., “Cycles and Reliability in Large Random Graphs,” AUP, Spring 2004

Ahmed, Ebad, “Distributed Optimization for Multicast Network Coding,” UROP Summer 2004, Fall 2004, Spring and Summer, Fall 2005

Acedanski, Szymon, “How Good is Random Linear Coding Based Distributed Networked Storage?” project through the Research Science Institute, Summer 2004

Tan, Jianlong, “Network Coding for Security,” UROP Fall 2004, Spring 2005

Vehkaperä, Mikko, “A Throughput-Delay Trade-Off in Packetized Systems with Erasures,” visiting student from Oulu University, Fall 2004, Spring 2005

Miliou, Natalia visiting student from ETH Zurich, Summer, Fall 2005

Loy, Jermaine, “Energy Efficient Joint Source/Channel Coding”, visiting student from Technical University Munich, Fall 2005

Kim, Minji, UROP student, “Conflict Graphs for Network Coding,” Spring 2006

Kim, Wonsik, UROP student, “Evolutionary Methods for Network Coding,” Summer 2006

Lima, Luisa, “Network Coding for Security”, visiting student from University of Porto, Portugal, Fall 2006, Spring 2008, Spring 2009

Ming, Xiao, visiting student from Chalmers University, Sweden, “Cross-layer Design of Rateless Random Network Codes for Delay Optimization” and “A binary coding approach for combination networks and general erasure networks”, Fall 2006-Spring 2007

Traskov, Danail, “Scheduling for Network-Coded Multicast”, and “Wireless Inter-Session Network Coding - An Approach Using Virtual Multicasts”, University of Illinois Urbana-Champaign and Technical University of Munich, Summer 2007

Singh, Jaspreet, “Functional Compression”, University of California Santa Barbara, Summer 2007

Fawaz, Nadia, “On the Non-Coherent Wideband Multipath Fading Relay Channel”, Supelec/Eurecom, Fall 2007

Educational Contributions of Muriel Médard

da Silva Machado Garcia Vilela, Joao Paulo “An Information-Theoretic Cryptanalysis of Network Coding – is Protecting the Code Enough?”, University of Porto, Spring 2008

Thakur, Mohit, “What is the optimal relay position for low-SNR networks?”, Technical University Munich, Fall 2008, Spring 2010

Soussi, Khaled, “Evaluation of a Wireless Video Transmission using Network Coding”, Technical University Munich, Fall 2008

Pedersen, Morten, “Network Coding in Mobile Wireless Networks”, Aalborg University, Spring 2009

Heide, Janus, “Network Coding in Mobile Wireless Networks”, Aalborg University, Spring 2009

Chang, Christopher, “Issues in Peer-to-Peer Networking: a Coding Optimization Approach”, Caltech, Summer 2009

Gorantla, Siva Kumar, “Network Coding with Channels”, University of Illinois Urbana-Champaign, Summer 2009

Mendes Alves da Costa, Rui Filipe, “Secure Network Coding”, University of Porto, Summer 2009

Fouli, Kerim, “Network Coding in Next-Generation Passive Optical Networks (NG-PONs)”, INRS, Spring 2010

Casse, Jerome, “Only the source's and sink's neighborhood matters: convergence results for unicast and multicast connections on random graphs and hypergraphs”, ENS, Spring-Summer 2010

Keller, Lorenzo, “Functional Compression”, EPFL, Summer 2010

Souillard-Mandar, William, UROP student, “Downloading a File Through Two Channels: Design and Analysis of Association Policies”, Summer-Fall 2010

Pezzolo Ciacaglia, Giuliano, UROP student, “Systematic Network Coding for Time Division Duplexing with the aid of a Relay”, Summer-Fall 2010, “Network Coding with the aid of a Relay”, Fall 2011, Spring 2012

Sayan, Sila, UROP student, “TCP with Network Coding”, Summer-Fall 2010

Graybill, Wesley, UROP student, “Galois Field Techniques for Network Coding”, Fall 2009, Spring 2010

Biktimirova, Aysylu, UROP student, “Network Combining with Network Coding”, Fall 2010

Zhang, Amy, UROP student “Functional Compression for Cloud Computing”, Spring 2011

Deny, Liz, UAP student “Graph Coloring for Functional Compression”, Spring 2011

Rambeloarison, Muriel, UAP student “Adaptive Sampling”, Spring 2011

Educational Contributions of Muriel Médard

Kuo, Emily, UROP student, “Network Coding Based DRM”, Summer 2011, Fall 2011

Almeida, Joao, “High SNR Physical Layer Security with Lattice Codes” University of Porto, Fall 2011

Guo, Wangmei, “Localized Dimension Growth: A Convolutional Random Network Coding Approach to Managing Memory and Decoding Delay”, X’ian University, Fall 2010- Fall 2011

Du, Jinfeng, “Lower Bounding Models for Wireless Networks”, KTH, Fall 2011

Lincoln, Andrea, UROP student, “Graph Declawing for Wireless Network Coded Scheduling”, Summer 2011 through Spring 2012

Voloch de Carvalho, Luis, UROP student, “Energy Efficient Cloud Computing Systems”, started Spring 2011, Fall 2011, Spring 2012

Wang, Szu-Po, UROP student, “Implementation of a Network Coded System on Software Defined Radios”, Fall 2011, Spring 2012

Ivan Sergeev, UROP student, UAP student “Network Coding Enabled MAC Protocol Development and Simulation for Next-Generation Local and Access Networks”, Fall 2011, Spring 2012 **Winner of the Licklider Award**

Simmons, Jamie, UROP student, UAP student, “MIT-UCLA Reliability of Communication Links”, Fall 2011, Spring 2012

Muco, Manushaqe, UROP student, “Fundamental Limits of Network Coding for Non-multicast Communications”, Spring 2012

Karafillis, Pavlina, high school intern, “An Algorithm for Improving Sliding Window Network Coding in TCP”, Summer 2012 (co-supervised with Kerim Fouli and Ali ParandehGheibi)

Josephson, Colleen, UROP student, “A Software-Defined Radio Implementation of a Cross-layer Network Coding Scheme”, Spring, Fall 2012, Spring 2013 (project became a Super UROP project, co-supervised with Georgios Angelopoulos)

Ponde de Oliveira Pinto, Henrique, UAP student, “Improving on the Insufficiency of Linear Network Coding”, Spring 2013, (co-supervised with Viveck Cadambe and Moshe Schwartz)

Pedroso, Marco Antonio L. UROP student, “A Green Touch to Cloud Computing”, Spring, Fall 2012, Spring 2013 (co-supervised with Ulric Ferner)

Chen, Zonghao, UROP student, “Outer bounds for network capacity”, Spring 2013 (co-supervised with Viveck Cadambe)

Long, Qiang, UROP student, “Toward Sustainable Networking: Network Coded Storage within Data Centers”, Spring 2013, (co-supervised with Ulric Ferner)

Educational Contributions of Muriel Médard

Lincoln, Andrea, UROP student, “Sending Single messages in Wired or Delay Tolerant Networks using Coding”, Summer 2013 (co-supervised with Keren Censor-Hillel and Nancy Lynch)

Wu, Yonglin, UROP student, “DNA fingerprinting in forensic genetics by signal processing and inference technique”, Summer 2013, Fall 2013, Spring 2014 (co-supervised with Ullrich Mönich and Viveck Cadambe)

Wang, Qiwen, “AFine Compression Code of Worst-case/Markov Insertion/Deletion Processes Without Editing Logs”, Chinese University of Hong Kong, Spring-Summer 2013

Johansen, Lars, “Performance enhancements in WiFi using Network Coding”, NTNU, Summer-Fall 2013

Harris, Helena, “Characteristics of Stutter in Allele Analysis”, project through the Research Science Institute, Summer 2013 (supervised by Ullrich Mönich)

De Caro, Jon Luca, “Network Coding over Structured Graphs”, project through the Research Science Institute, Summer 2013 (supervised by Viveck Cadambe)

Jay, Maya, “Storage-communication Tradeoffs”, high school intern, Summer 2013 (supervised by Viveck Cadambe)

Hansen, Jonas, “Network Coding with Openflow”, Aalborg University, Fall 2013

Krisglund, Jeppe, “Network Coding with Openflow”, Aalborg University, Fall 2013

Long, Qian, UAP student, “Building a Test Bed for Network Coded Storage for Energy Reduction In Data Centers”, Fall 2013 (supervised by Ulric Ferner)

Menshova, Marie, “Uniformity under Compression and MDS Coding for List-source Coding and Guesswork”, Spring 2014, Fall 2014, Spring 2015 (supervised by Flavio du Pin Calmon)

Sweeting, Naomi, “Heuristics and Algorithms on RLNC Aided Network Reduction”, project through the Research Science Institute, Summer 2014 (supervised by Jinfeng Du)

Lin, Jessica, “Interplay of Network and Channel Coding in Delay Constrained Wireless Transmission”, high school intern, Summer 2014 (supervised by Jinfeng Du)

Ontiveros, Victoria, “Some Optimization-Based Linear Network Coding Approaches for General Connections”, high school intern, Summer 2014 (supervised by Ying Cui)

Pandhya, Dhairat, “Some Optimization-Based Linear Network Coding Approaches for General Connections”, project through the Research Science Institute, Summer 2014 (supervised by Ying Cui) (winner of a top 5 RSI award) (Semi-Finalist in the Siemens Competition) (Finalist in the Intel Competition)

Chres Sørensen, “Sparse Network Coding”, Aalborg University”, Aalborg University, Fall 2014,

Educational Contributions of Muriel Médard

Haiyan Xin, “Analog Network Coding”, Chinese University of Hong Kong, Fall 2014

‘Etuate Cocker. “Coded TCP with Satellites”, University of Auckland, Fall 2014.

Sayeed Tasnim, “Optimization Techniques for General Connections Using Network Coding”, Super UROP, Fall 2014-Spring 2015.

Felipe Radovitzky, “Password Statistics”, high school intern, Summer 2015 (supervised by Ahmad Beirami)

Erik Uhlmann, “Password Statistics”, high school intern, Summer 2015 (supervised by Ahmad Beirami).

Publications of Muriel Médard

1. Books

M. Médard and Sprintson, A. (editors), "Network Coding: Fundamentals and Applications", AP, Elsevier

2. Papers in Refereed Journals:

1. M. Médard, Marquis, D., Barry, R.A., and Finn, S.G., "Security Issues in All-Optical Networks," *IEEE Network Magazine*, Vol. 11, Issue 3, pp. 42-48, May 1997.
2. M. Médard, Chinn, S.R., Saengudomlert, P., "Attack Detection in All-Optical Networks," in *Trends in Optics and Photonics (TOPS)-Vol. 20 -Optical Networks and their Applications*, Barry, R.A., editor, published by the Optical Society of America, pp. 227-232, 1998. **
3. S.G. Finn, Médard, M., Barry, R.A., "A New Algorithm for Bi-directional Link Self-Healing for Arbitrary Redundant Networks," in *Trends in Optics and Photonics (TOPS)-Vol. 20-Optical Networks and their Applications*, Barry, R.A., editor, published by the Optical Society of America, pp. 222-226, 1998.
4. M. Médard, Barry, R.A., Finn, S.G., Gallager, R.G., "Automatic Protection Switching for Multicasting in Optical Mesh Networks," in *Trends in Optics and Photonics (TOPS)-Vol. 20-Optical Networks and their Applications*, Barry, R.A., editor, published by the Optical Society of America, pp. 216-221, 1998.
5. M. Médard, Finn, S.G., Barry, R.A., Gallager, R.G., "Redundant Trees for Preplanned Recovery in Arbitrary Vertex-Redundant or Edge-Redundant Graphs," *IEEE/ACM Transactions on Networks*, Vol. 7, Issue 5, pp. 641 -652, October 1999.
6. M. Médard, "The Effect Upon Channel Capacity in Wireless Communications of Perfect and Imperfect Knowledge of the Channel," *IEEE Transactions on Information Theory*, Vol. 46, Issue 3, pp. 935-946, May 2000. (**Winner of the IEEE 2002 Leon Kirchmayer Prize Paper Award**)
7. S. Lumetta, Médard, M., and Tseng, Y., "Capacity Versus Robustness: A Tradeoff for Link Restoration in Mesh Networks," *IEEE Journal of Lightwave Technology*, Vol. 18, Issue 12, pp. 1765 -1775, March 2001. **
8. M. Médard, Chinn, S.R., and Saengudomlert, P., "Node Wrappers for QoS Monitoring in Transparent Optical Nodes," *Journal of High Speed Networks* (yearly publication), IOS Press, pp. 247-268, 2001. **
9. M. Médard and Lumetta, S.S., "Architectural Issues for Robust Optical Access," *IEEE Communications Magazine*, Vol. 39, Issue 7, pp. 116-220, July 2001.
10. M. Médard, Barry, R.A., Finn, S.G., He, W., Lumetta, S.S., "Generalized Loop-back Recovery in Optical Mesh Networks," *IEEE/ACM Transactions on Networking*, Vol. 10, Issue 1, pp. 153-164, February 2002. **
11. M. Médard and Gallager, R.G., "Bandwidth Scaling for Fading Multipath Channels," *IEEE Transactions on Information Theory*, Vol. 48, Issue 4, pp. 840 -852, April 2002.
12. P. Saengudomlert and Médard, M., "Guaranteeing BER in Transparent Optical Networks Using OOK Signaling," *IEEE Journal on Selected Areas in Communications*, Vol. 20, Issue 4, pp. 786-799, May 2002. **
13. M. Médard, Lumetta, S.S., and Li, L., "A Network Management Architecture for Robust Packet Routing in Mesh Optical Access Networks," invited paper in *IEEE Journal on Selected Areas in Communications*, Vol. 20, Issue 4, pp. 822-833, May 2002.

Publications of Muriel Médard

14. R. Koetter and Médard, M., "Beyond Routing: An Algebraic Approach to Network Coding," *IEEE/ACM Transactions on Networking*, Vol. 11, Issue 5, pp. 782-796, October 2003. (selected as one of the outstanding papers from INFOCOM for transfer to *IEEE/ACM Transactions on Networking*)
15. M. Jinho, Leonberger, F.J., Médard, M., Ransom, N., and Von Lehmen, A., "Guest Editorial: Optical Networks," *IEEE Journal of Lightwave Technology*, Vol. 21, Issue 11, pp. 2452-2454, November 2003.
16. M. Médard, "Channel Uncertainty in Communications," invited paper in *IEEE Information Theory Society Newsletter*, starting on page 1 (4 pages), June 2003.
17. M. Médard, Huang, J., Goldsmith, A., Meyn, S., and Coleman, T.P., "Capacity of Time-slotted ALOHA Packetized Multiple-Access Systems over the AWGN Channel," *IEEE Transactions on Wireless Communications*, Vol. 3, Issue 2, pp. 486-499, March 2004. **
18. D.S. Lun, Médard, M., and Abou-Fayçal, I.C., "On the Performance of Peak Capacity-achieving Signaling on Multipath Fading Channels," *IEEE Transactions on Communications*, Vol. 52, Issue 6, pp. 931-938, June 2004. **
19. T.P. Coleman and Médard, M., "A Distributed Scheme for Achieving Energy-Delay Tradeoffs with Multiple Service Classes over a Dynamically Varying Network," *IEEE Journal on Selected Areas in Communications-Special Issue on Advanced Mobility Management and QoS Protocols for Wireless Internet*, Vol. 22, Issue 5, pp. 929-941, June 2004. **
20. M. Effros, Médard, M., Ho, T., Ray, S., Karger, D., Koetter, R., and Hassibi, B., "Linear Network Codes: A Unified Framework for Source, Channel, and Network Coding," *Advances in Network Information Theory, DIMACS Series in Discrete Mathematics and Theoretical Computer Science*, Vol. 66, pp. 197-216, Editors: Gupta et al., 2004. **
21. G.E. Weichenberg, Chan, V.W.S., and Médard, M., "High-Reliability Topological Architectures for Networks under Stress," *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Vol. 22, Issue 9, pp. 1830-1845, November 2004. **
22. T. Ho, Médard M., and Koetter, R., "An Information Theoretic View of Network Management," *IEEE Transactions on Information Theory*, Vol. 51, Issue 4, pp. 1295-1312, April 2005. **
23. I. Abou-Fayçal, Médard, M., and Madhow, U., "Binary Adaptive Coded Pilot Symbol Assisted Modulation over Rayleigh Fading Channels without Feedback," *IEEE Transactions on Communications*, Vol. 53, Issue 6, pp. 1036-1046, June 2005.
24. D. Karger and Médard, M., "Toward Using the Network as a Switch," *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Vol. 23, Issue 8, pp.1533-1541, August 2005.
25. C. Luo, Médard, M., and Zheng, L., "On Achieving Wideband Capacity Using Multitone FSK," *IEEE Journal on Selected Areas in Communications (JSAC)-Special Issue on Differential and Noncoherent Wireless Communications*, Vol. 23, Issue 9, pp. 1830-1838, September 2005. **
26. D.S. Lun, Ratnakar, N., Médard, M., Koetter, R., Karger, D.R., Ho, T., Ahmed, E., and Zhao, F., "Minimum-Cost Multicast over Coded Packet Networks," *IEEE Transactions on Information Theory*, Vol. 52, Issue 6, pp. 2608-2623, June 2006. **
27. S. Deb, Médard, M., and Choute, C., "Algebraic Gossip: A Network Coding Approach to Optimal Multiple Rumor Mongering," *IEEE Transactions on Information Theory*, Vol. 52, Issue 6, pp. 2486-2507, June 2006. **

Publications of Muriel Médard

28. N. Cai, Chiang, N.M., Effros, M., Koetter, R., Médard, M., Prabhakar, B., Srikant, R., Towsley, D., and Yeung, R.W., "Introduction to the Special Issue on Networking and Information Theory," *IEEE Transactions on Information Theory*, Vol. 52, Issue 6, pp. 2285-2288, June 2006.
29. M. Médard and Srikant, R., "Capacity of Nearly-decomposable Markovian Fading Channels Under Asymmetric Receiver-sender Side Information," *IEEE Transactions on Information Theory*, Vol. 52, Issue 7, pp. 3052-3062, July 2006.
30. T.P. Coleman, Lee, A.H., Médard, M., and Effros, M., "Low-Complexity Approaches to Slepian-Wolf Near-Lossless Distributed Data Compression," *IEEE Transactions on Information Theory*, Vol. 52, Issue 8, pp. 3546-3561, August 2006. **
31. J. Huang, Meyn, S.P., and Médard, M., "Error Exponents for Channel Coding and Signal Constellation Design," *IEEE Journal on Selected Areas in Communications (JSAC)-Special Issue on Nonlinear Optimization of Communication Systems*, Vol. 24, Issue 8, pp.1647-1661, August 2006.
32. T. Ho, Médard, M., Koetter, R., Karger, D.R., Effros, M., Shi, J., and Leong, B., "A Random Linear Network Coding Approach to Multicast," *IEEE Transactions on Information Theory*, Vol. 52, Issue 10, pp. 4413-4430, October 2006. ** (**Winner of the 2009 of the IEEE Communication Society and Information Theory Society joint Paper Award**)
33. J.-S. Park, Lun, D.S., Yi, Y., Gerla, M., and Médard, M., "CodeCast: A Network Coding Based Ad Hoc Multicast Protocol," *IEEE Wireless Communications Magazine*, Vol. 13, Issue 5, pp. 76-81, October 2006. **
34. A.J. Goldsmith and Médard, M., "Capacity of Time-Varying Channels With Causal Channel Side Information," *IEEE Transactions on Information Theory*, Vol. 53, Issue 13, pp. 881-899, March 2007.
35. L. Zheng, Tse, D.N.C., and Médard, M., "Channel Coherence in the Low-SNR Regime," *IEEE Transactions on Information Theory*, Vol. 53, Issue 13, pp. 976-997, March 2007.
36. D. S. Lun, Jennings, L.D., Koetter, R. Licht, S., and Médard, M., "An Information-Based Computational Technique for Estimation of Chromatographic Peak Purity", *Journal of Chemical Information and Modeling*, Volume 47, Issue 5, pp. 1973 - 1978
37. S. Ray, Médard, M., and Zheng, L., "On Non-coherent MIMO Channels in the Wideband Regime: Capacity and Reliability," *IEEE Transactions on Information Theory*, Volume 53, Issue 6, June 2007, pp. 1983 – 2009. **
38. M. Effros, Koetter, R., and Médard, M., "Breaking Network Logjams," *Scientific American*, Vol. 296, Number 6, pp. 78-85, June 2007.
39. G. Weichenberg, Chan, V., and Médard, M., "On the Capacity of Optical Networks: A Framework for Comparing Different Transport Architectures," *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Volume 25, Issue 6, August 2007, pp. 84 – 101. **
40. J.-K. Sundararajan, Deb, S., and Médard, M., "Extending the Birkhoff-von Neumann Switching Strategy for Multicast-On the use of Optical Splitting in Switches," *IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series*, Volume 25, Issue 6, August 2007, pp. 36-50. **
41. D. S. Lun, Médard, M., Koetter, R., Effros, M., "On Coding for Reliable Communication over Packet Networks", *Physical Communication*, Volume 1, Issue 1, March 2008, pp. 3-20

42. S. Jaggi, Langberg M., Katti S., Ho T., Katabi D., Médard, M., and Effros, E., “Resilient Network Coding in the Presence of Byzantine Adversaries”, *Special Issue on Information-theoretic Security of the IEEE Transactions on Information Theory*, Volume 54, Issue 6, June 2008, pp. 2596 - 2603
43. T. Ho, Leong, B., Koetter, R., Médard, M., and Effros, E., “Byzantine Modification Detection in Multicast Networks with Random Network Coding”, *Special Issue on Information-theoretic Security of the IEEE Transactions on Information Theory*, Volume 54, Issue 6, June 2008, pp. 2798-2803
44. S. Katti, Rahul, H., Hu, W. , Katabi, D., Médard, M., and Crowcroft, J., “XORs in the Air: Practical Wireless Network Coding”, *IEEE/ACM Transactions on Networking*, Volume 16, Issue 3, June 2008, pp. 497 – 510 (**winner of the 2009 William R. Bennett Prize in Network Communications**)
45. S. Jing, Zheng, L., and Médard, M., “On Training with Feedback in Wideband Channels”, *IEEE Journal on Selected Areas in Communications: Special Issue on Limited Feedback*, Volume 26, Issue 8, October 2008, pp:1607 - 1614**
46. L. D. Jennings, Lun, D. S., Médard, M., and Licht, S. “ClpP Hydrolyzes a Protein Substrate Processively and Independently with Respect to the ClpA ATPase: Mechanistic Studies of ATP-Independent Processive Proteolysis”, *Biochemistry*, 47(44):11536-11546, November 2008
47. A. Eryilmaz, Ozdaglar, A., and Médard, M., “On the Delay and Throughput Gains of Coding in Unreliable Networks”, *IEEE Transactions on Information Theory*, Volume 54, Issue 12, December 2008, pp:5511- 5524
48. D. Lucani, Stojanovic, M., and Médard, M., “Channel Models and Network Coding based Lower Bound to Transmission Power for Multicast”, *IEEE Journal on Selected Areas in Communications: Special Issue on Underwater Acoustic Networks*, Volume 26, Issue 9, December 2008, pp:1708 -1719**
49. P. Youssef-Massaad, Zheng, L., and Médard, M., “Bursty Transmission and Glue Pouring: on Wireless Channels with Overhead Costs”, *IEEE Transactions on Wireless Communications*, Volume 7, Issue 12, Part 2, December 2008, pp:5188 - 5194 **
50. G. Weichenberg, Chan, V., and Médard, M., “Design and Analysis of Optical Flow Switched Networks”, *IEEE/OSA Journal of Optical Communications and Optical Networking*, Volume 1, Issue 3, August 2009, pp:B81 - B97**
51. W. Chen, Traskov, D., Heindlmaier, M., Médard, M., Meyn, S., and Ozdaglar, A., “Coding and Control for Communication Networks”, *Queueing Systems: 100 Years of Queueing - the Erlang Centennial*, Vol. 63, Nos 1-4, December 2009, pp. 195-216
52. X. Shi, Lun, D.S., Médard, M., Kötter, R., Meldrim, J.C., Barry, A.J., “Joint Base-Calling of Two DNA Sequences With Factor Graphs,” *IEEE Transactions on Information Theory*, vol.56, no.2, pp.724-733, Feb. 2010**
53. L. Lima, Gheorghiu, S., Barros, J., Médard, M., and Toledo, A. T. “Secure Network Coding for Multi-Resolution Wireless Video Streaming,” *IEEE Journal of Selected Areas in Communications*, vol. 28, Issue 3, March 2010 , pp. 377-388
54. M. Kim, Lima, L., Zhao, F., Barros, J, Médard, M., Koetter, R., Kalker, T. and Han, K., “On Counteracting Byzantine Attacks in Network Coded Peer-to-Peer Networks”, *IEEE Journal on Selected Areas in Communications: Special Issue on Mission-Critical Infrastructure*, vol 28, Issue 5, May 2010, pp. 692-702**

Publications of Muriel Médard

55. G. Durrett, Médard, M., and O'Reilly U.-M., "A Genetic Algorithm to Minimize Chromatic Entropy", P. Cowling and P. Merz (Eds.): *EvoCOP 2010*, LNCS 6022, pp. 59--70. Springer, Heidelberg (2010)
56. V. Doshi, Shah, D., Médard, M., and Effros, M., "Functional Compression Through Graph Coloring", *IEEE Transactions on Information Theory*, Vol. 56, No. 8, August 2010, pp. 3901-3917**
57. A. ParandehGheibi, Eryilmaz, A., Ozdaglar, A., and Médard, M., "On Resource Allocation in Fading Multiple Access Channels -- An Efficient Approximate Projection Approach", *IEEE Transactions on Information Theory*, Vol. 56, No. 9, September 2010, pp. 4417-4437**
58. M. Kim, Sundararajan, J.K, Médard, M., Eryilmaz, A., Koetter, R., "Network Coding in a Multicast Switch", *IEEE Transactions on Information Theory*, vol. 57, no. 1, January 2011, pp. 436-460**
59. M. Effros, Forney, G. D., Kschischang, F., Médard, M., Singer, A. and Vardy, A., "The Scientific Legacy of Ralf Koetter", *IEEE Transactions on Information Theory*, vol. 57, no. 2, February 2011, pp. 589-592
60. R. Kötter, Effros, M., Médard, M., "On a Theory of Network Equivalence", *IEEE Transactions on Information Theory*, vol. 57, no. 2, February 2011, pp. 972-995
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349. U. Speidel, Cocker, 'E., Vingelmann, P., Heide, J., and Médard, M., "Can Network Coding Bridge the Digital Divide in the Pacific?", *Netcod 2015*
350. U. Speidel, L. Qian, 'E. Cocker, P. Vingelmann, J. Heide, M. Médard, "Can Network Coding Mitigate TCP-induced Queue Oscillation on Narrowband Satellite Links?", *International Conference on Wireless and Satellite Systems*, 301–314, Springer International Publishing, July 2015
351. J. Cloud, and Médard, M. "Network Coding over SATCOM - Lessons Learned", *WiSATS 2015***,
352. A. Salimi, Médard, M. and Cui., R., "On the Representability of Integer Polymatroids: Applications in Linear Code Construction", *Allerton 2015*
353. P. Narayana Moorthy and Médard, M. "Communication Cost for Updating Functions when Message Updates are Sparse: Connections to Maximally Recoverable Codes", **invited paper**, *Allerton 2015*
354. A. Beirami, Calderbank, R., Christiansen, M., Duffy, K, Makhdoumi, A., and Médard, M., "A Geometric Perspective on Guesswork", *Allerton 2015*
355. V. Abdrashitov and Médard, M., "Durable Network Coded Distributed Storage", *Allerton 2015***
356. Y. Cui, Médard, M., Pandya, D., Yeh. E., Leith, D., and Duffy, K., "A Linear Network Code Construction for General Integer Connections Based on the Constraint Satisfaction Problem", *Globecom 2015 CTS*
357. E. Kantor, Konwar, K., Lynch, N., Médard, M., Narayana Moorthy, P., and Shvartsman, A., "Storage Optimized Data Atomic Algorithms for Handling Erasures and Errors in Distributed Storage Systems", *30th IEEE International Parallel & Distributed Processing Symposium*
358. X. Liu, Médard, M., and Li, W., "Network-Coding-based Multipath Transmission in Software Defined Fiber-Wireless Networks", *NetSoft 2016*
359. C. Hellge and Médard, M., "Multi-code distributed storage", *IEEE Cloud 2016*
360. N. Raviv, Yaakobi, E., and Médard, M., "Coding for Locality in Reconstructing Permutations", *ISIT 2016*
361. J. Du, Médard, M., and Shamai, S., "Cost of Local Cooperation in Hierarchical Virtual MIMO Transmission Schemes", *ITW 2016*
362. Q. Wang, Médard, M., and Skoglund, M., "Efficient Compression Algorithm For File Updates Under Random Insertions And Deletions" *ITW 2016*
363. R. Alkurd, Shubair, R. M., and Médard, M., "Optimum HDAF Relay-Assisted Combining Scheme with Relay Decision Information", *VTC 2016*
364. P. Narayana Moorthy, Abdrashitov, V., and Médard, M., "A Generalization of Regenerating Codes for Clustered Storage Systems", **invited paper**, *Allerton 2016***
365. R. MacDonald and Médard, M., "Obfuscating Poisson & Gaussian Data Using a Rotation in the Complex Plane", *Asilomar 2016*
366. V. Abdrashitov and Médard, M., "Staying Alive - network coding for data persistence in volatile networks", **invited paper**, *Asilomar 2016***
367. S. Salamatian, Cohen, A., and Médard, M., "Efficient Coding for Multi-source Networks using Gacs-Korner Common Information", *ISITA 2016***
368. P. Chin, Médard, M., and Noubir, G., "Wi(deband)-Fi: a proposal for an opportunistic wideband architecture based on Wi-Fi", *MOBIWAC 2016*
369. D. Whisman, Médard, M., Kusuma, J, and Croux, A., "Benefits of Opportunistic Routing, Implicit Acknowledgments, and Network Coding on a Linear Broadcast Network", *Netcod 2016***
370. J. Cloud and Médard, M., "Multi-Path Low Delay Network Codes", *Globecom 2016***
371. U. Speidel, Cocker, 'E., Médard, M., Heide, J., and Vingelmann, P., "Topologies for

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the Provision of Network-Coded Services via Shared Satellite Channels”, *SPACOMM 2017 (Winner Best Paper Award)*

372. C. Sorensen, Lucani, D., and Médard, M., “On Network Coded Filesystem Shim: Over-the-top Multipath Multi-Source Made Easy”, *ICC 2017*
373. N. Farsad, Rose, C., Médard, M., and Goldsmith, A., “Capacity of Molecular Channels with Imperfect Particle-Intensity Modulation and Detection”, *ISIT 2017*
374. W. Huleihel, Salamatian, S., Merhav, N., and Médard, M., “Gaussian ISI Channels with Mismatch”, *ISIT 2017***
375. S. Salamatian, Beirami, A., Cohen, A., and Médard, M., “Centralized vs Decentralized Multi-Agent Guesswork”, *ISIT 2017***
376. A. Cohen, Cohen, A., Gurewitz, O., and Médard, M., “Individually-Secure Multi-Source Multicast”, *ISIT 2017*
377. W. Huleihel, Salamatian, S., and Médard, M., “Guessing With Limited Memory”, *ISIT 2017***
378. K. Konwar, Narayana Moorthy, P., Lynch, P. and Médard, M., “A Layered Architecture for Erasure-Coded Consistent Distributed Storage”, accepted to *PODC 2017*
379. A. Abdrashitov, Prakash, N., and Médard, M., “The Storage vs Repair Bandwidth Trade-off for Multiple Failures in Clustered Storage Networks”, accepted to *ITW 2017***
380. W. Huleheil, and Médard, M., “Privacy Through Familiarity”, accepted to *ITW 2017*.
381. A. Kose, and Médard, M., “Scheduling Wireless Ad Hoc Networks in Polynomial Time Using Claw-free Conflict Graphs”, accepted to *PIMRC 2017***.

3. Other publications:

1. Book Chapter: M. Médard and Lumetta, S.S., “Network Reliability and Fault Tolerance,” *Wiley Encyclopedia of Engineering*, Editor: J.G. Proakis.
2. Book Chapter: D.S. Lun, Ho, T., Ratnakar, N., Koetter, R., and Médard, M., “Network Coding in Wireless Networks -A survey of techniques for efficient operation of coded wireless packet networks,” *Cooperation in Wireless Communications: Principles and Applications*, Springer, Editors: F. Fitzek and M. Katz, 2007.
3. Book Chapter: F. Zhao, Médard, M., Lun, D.S., and Ozdaglar, A., “Minimum Cost Subgraph Algorithms for Static and Dynamic Multicasts with Network Coding”, *Directions in Wireless Communications*, Springer, Editor: Vahid Tarokh, 2009.

4. Internal Memoranda:

4. H. Wang, Modiano, E., and Médard, M., “Partial Path Protection for WDM Networks-End-to-end Recovery using Local Failure Information,” Technical Report LIDS-2517, September 2001.
5. D.S. Lun, Médard, M., Ho, T., and Koetter, R., “Network Coding with a Cost Criterion,” Technical Report LIDS-P-2584, April 2004.
6. J.K. Sundararajan, Zhao, F., Youssef-Massaad, P.G., and Médard, M., “A Modification to RED AQM for CIOQ Switches,” Technical Report LIDS-2585, April 2004.
7. J. K. Sundararajan, Deb, S., and Médard, M., “To Copy or not to Copy: Extending the Birkhoff-von Neumann Switching Strategy to Multicast Switches,” Technical Report LIDS-2624, August. 2004.

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8. D. S. Lun, Ratnakar, N., Koetter, R., Médard, M., Ahmed, E., and Lee, H., “Achieving Minimum Cost Multicast: A Decentralized Approach Based on Network Coding,” Technical Report LIDS-P-2629, September 2004.
9. G. Weichenberg, Chan, V.W.S., and Médard, M., “On the Capacity of Optical Networks: A Framework for Comparing Different Transport Architectures,” Technical Report LIDS-P-2655, MIT LIDS, July 1 2005.
10. S. Jaggi, Langberg, M., Katti, S., Ho, T., Katabi, D., and Médard, M., “Resilient Network Coding in the Presence of Byzantine Adversaries”, MIT-CSAIL-TR-2006-053, August 1, 2006
11. K. Censor-Hillel, Haeupler, B., Lynch, N., and Médard, M., “Bounded Contention Coding for Wireless Networks in the High SNR Regime”, MIT-CSAIL-TR-2012-026, August 2012
12. V. Cadambe, Lynch, N., Médard, M., and Musial, P., "Coded Emulation of Shared Atomic Memory for Message Passing Architectures", MIT-CSAIL-TR-2013-016, July 2013.
13. S. Feizi, K. Duffy, M. Kellis; M. Medard, "Network Infusion to Infer Information Sources in Networks", MIT CSAIL, 2014-12-02.

1. Invited Lectures:

2. Spring 1997 “Optical Network Security,” Steering Committee Lecture, MIT Lincoln Laboratory
3. Fall 1997 “Spreading and Recovery: topics in communications,” **invited** seminar, University of California, Berkeley
4. Fall 1997 “Topics in Communications,” **invited** seminar, University of Illinois Urbana-Champaign
5. Spring 1998 “Topics in Optical Network Security,” **invited** seminar, University of Maryland and MIT
6. Spring 1998 “Security in Optical Networks,” **invited** seminar, Rensselaer Polytechnic Institute
7. Fall 1998 “Restoration in Optical Networks,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois, Urbana-Champaign
8. Fall 1998 “Spreading in Time-varying Channels,” **invited** seminar, University of Michigan
9. Spring 1999 “Capacity of Time-varying Channels with Side Information,” **invited** seminar, University of Michigan and MIT
10. Summer 1999 “Capacity of Time-varying Channels with Side Information,” **invited** seminar, Northwestern University
11. Fall 1999 “An Overview of Security for Optical Networks,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois Urbana-Champaign
12. Fall 1999 “Capacity of Fast Time-varying Channels with Side Information,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois Urbana-Champaign
13. Fall 2000 “Restoration in Optical Networks,” **invited** seminar, Carnegie-Mellon University
14. Spring 2001 M. Médard, “Robustness and Recovery in Optical Networks,” **invited** presentation, *IEEE Gigabit Networking Workshop*, also

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15. **invited** seminar, George Washington University
16. May 2001 “Some different aspects of adaptive coding for wireless communications,” **invited** seminar, Stanford University also
17. **invited** seminar, Lucent Bell Labs (June 2001)
18. June 2001, “Robust Optical Communications,” **invited** seminar, Lucent Bell Labs
19. May 2001 and August 2001 “Robustness and Security in Optical Networks,” presentation for AFOSR URI kickoff at Stanford University and AFOSR program review at Wright-Patterson Air Force Base
20. October 2001 “Some New Directions in Communications and Networking,” **invited** tutorial, Federal Communications Commission
21. December 2001, “Network Coding for Capacity and Robustness,” **invited** talk at the DIMACS (Center for Discrete Mathematics and Theoretical Computer Science at Rutgers University) Workshop on Codes and Complexity
22. December 2001, “Optical Network Security,” **invited** talk to the DARPA Information Assurance for Optical Networks (OpticIA) Workshop
23. March 2002, “When the Physical Layer Matters -a perspective on networking aspects of wireless communications,” **invited** talk, Information Science and Technology (ISAT) study group for DARPA on “Robust Networks for Critical Missions and Critical Infrastructure”
24. April 2002, “Some Aspects of Robustness in Wireless Networks,” **invited** seminar, University of Massachusetts, Amherst
25. June 2002, “Overview of New Results in Optical Access Networks Robustness,” **invited** Photonics Series seminar at the University of Illinois Urbana-Champaign
26. October 2002, M. Médard and Kim, M., “A Bound on Backup Path Lengths Using a Random Graph Approach,” **invited** paper, IEEE Annual Computer Communications Workshop, 2002
27. October 2002, “Network Coding and Network Management-Towards Fundamental Limits?” **invited** seminar, Cornell University, also
28. **Invited** seminar, Boston University
29. November 2002, “Security in Optical Networks,” **invited** briefing to the Assistant Secretary of Defense (C3I) (Highland Forum), at the Pentagon (Washington, D.C.)
30. Spring 2003, “Network Coding: Towards an Unified View of Routing, Network Management, Coding and Compression?” **invited** seminar, Applied Mathematics Department, Brown University, also
31. **Invited** seminar, ECE Department, Georgia Tech, also **invited** IBM Lecture, Notre Dame University
32. Fall 2004, “Network Coding: Towards an Unified View of Routing, Recovery, Coding and Compression?” **invited** seminar, Harvard University
33. Spring 2004, “Coding for Networks,” **invited** presentation, the Annual Lee Center Workshop (Caltech's Lee Center for Advanced Networking), in which 4 guest speakers present to Caltech faculty, students and alumni
34. May 2004, D.S. Lun, M. Médard, T. Ho, Koetter, R., “Network Coding with a Cost Criterion,” **invited** talk, Communication Theory Workshop

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35. May 2004, “Network Coding: an Introduction,” a one-day course given to the Centre for Wireless Communications at the University of Oulu, Finland (co-taught with Ralf Koetter of UIUC)
36. August 2004, “Towards a Random, Distributed Operation of Networks,” **invited** presentation, Lucent Bell Labs, also Colloquium, Northeastern University, October 2004
37. October 2004, “Byzantine Modification Detection in Multicast Networks Using Randomized Network Coding,” **invited** seminar, Northeastern University
38. October 2004, “On the Implications of Optical Splitting for Multicasting,” **invited** presentation, 19th IEEE Annual Computer Communications Workshop
39. December 2004, “Network Coding,” one-day tutorial at the IEEE Global Telecommunications Conference (Globecom) (co-taught with Ralf Koetter of UIUC and Phil Chou of Microsoft)
40. January 2005, “An Overview of the Use of Distributed Mechanisms in Network Coding,” **invited** presentation, DIMACS (Center for Discrete Mathematics and Theoretical Computer Science at Rutgers University) Workshop on Network Coding
41. April 2005. “Network Coding for Cost, Reliability and Ease of Management,” **invited** seminar, Yale University
42. June 2005, “Network Coding in Wireless Networks,” **Plenary Speaker**, IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC), New York
43. June 2005, “Network Coding -an Introduction,” **Invited Seminar**, Seminaire Euronetlab, Universite Pierre et Marie Curie, Paris
44. June 2005 “Network Coding for Cost, Reliability and Ease of Management,” **Invited Seminar**, Ecole Nationale Supérieure de Telecommunications de Bretagne, aJoint IEEE Comsoc & IT-Lab Conference on Communications and Coding, also
45. June 2005, **Invited Seminar**, ENST Paris, also
46. July 2005, **Invited Seminar**, Ecole Polytechnique Federale de Lausanne
47. September 2005, “On Distributed Optimization for Networks,” **Keynote Speaker**, Mobile Information and Communications Systems Scientific Conference, Loewenberg, Switzerland
48. September 2005, “Network Coding,” one-day **Tutorial** at the IEEE International Symposium on Information Theory (co-taught with Ralf Koetter of UIUC and Phil Chou of Microsoft)
49. December 2005, “Wireless Network Coding,” Signal Processing/ Communications **Invited Seminar**, University of California at Los Angeles
50. April 2006, “Wireless Network Coding,” **Invited Seminar**, University of Texas at Austin,
51. May 2006, “Network Coding-Where to Now?” **Plenary Speaker**, IFIP Networking 2006, also **Invited Seminar**, May 2006, University of Porto, Portugal
52. June 2006, “Network Coding-An Overview,” **Invited Seminar**, Ecole Nationale Supérieure de Télécommunications de Bretagne, Rennes
53. June 2006, “Distributed Network Coding for Sensor Networks,” **Tutorial**, International Workshop on Wireless and Ad Hoc Networks 2006
54. August 2006, “Network Coding: A Tutorial,” **Tutorial**, University of California at San Diego, ITA Center (co-taught with Ralf Koetter of UIUC)

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55. August 2006, “Network Coding for Wireless Networks,” **Invited Seminar**, University of Southern California
56. March 2007, “Network Coding-an Optimization View,” **Plenary Speaker**, Conference on Information Sciences and Systems, Johns Hopkins University, also
57. April 2007 **General Dynamics Distinguished Lecture Series**, University of Michigan also
58. **Invited Seminar** Intel Workshop on Wireless Communications (last two cancelled because of sickness)
59. May 2007, “Some Interesting Directions in Network Coding,” **Invited Seminar**, workshop on Algorithms, Inference and Statistical Physics, Santa Fe, NM, organized by the Los Alamos National Laboratory and the Center for Nonlinear Studies
60. May 2007, “Introduction to Network Coding,” **Tutorial**, IFIP Networking 2007, Atlanta, Georgia, also Workshop on Network Coding, Hong Kong, January 2008
61. May 2007, “On Security Aspects of Network Coding,” **Invited Seminar**, IEEE Communications Theory Workshop, Sedona, Arizona
62. September 2007, “Le codage sur réseaux - théorie, applications et nouvelles frontières”, **Plenary Speaker**, GRETSI 2007, Troyes, France
63. September 2007, “New Directions in Wireless Communications,” **Gilbreth Lecture** to the National Academy of Engineering
64. January 2008, “On Theory and Practice in Network Coding”, **Keynote Lecture**, Coordinated Science Laboratory at UIUC 3rd annual Student Conference in the areas of Control, Communications and Signal Processing.
65. February 2008, “Delay and throughput in network coding”, **Invited Seminar**, Iowa State University
66. June 2008, “Network Coding”, **Invited Course**, First School of Information Theory, organized by the IEEE Information Theory Society at Penn State
67. June 2008, “Network coding and security”, **Keynote Address**, IEEE Workshop on Wireless Network Coding, San Francisco
68. June 2008, “An Introduction to Network Coding”, **Short Course** given at Bretagne Telecom, France
69. June 2008, “Le codage sur réseaux – principes et applications”, **Invited Seminar**, at the PRACOM conference, Bretagne Telecom, France
70. September 2008, “Introduction to Network Coding”, **Tutorial** at the IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2008, Cannes, France, co-taught with Ralf Koetter of TUM
71. September 2008, “How to Get There from Here”, **Presentation** to the Networking Networking (N²) Women Forum, Cannes, France
72. September 2008, “On the intersection between queueing and information theory - some new results”, **Invited Seminar** at Eurecom, France, also
73. November 2008, **Invited Seminar**, University of Illinois, Chicago (November 2008), also
74. February 2009, **Invited Seminar**, Harvard, also

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75. April 2009, **Invited Seminar**, University of California San Diego, also
76. May 2009, Ohio State University **Invited Seminar**, also
77. July 2009, **Invited Seminar** at KAIST, Korea **Invited Lecture** at CTTC under Catalonia's Invited Lectureship Program, Barcelona, Spain (July 2009)
78. May 2009, "On the Confluence of Information Theory and Networking", **Plenary Lecture**, Conftele, Portugal
79. May 2009, "Network coding and security - new paradigms", **Keynote Address**, European Wireless Conference, Aalborg, Denmark
80. May 2009, "Network coding", tutorial, Muriel Médard, Joerg Widmer and Frank H.P. Fitzek, European Wireless Conference, Aalborg, Denmark
81. September 2009, "Bringing network coding into the network", **Keynote Address**, International Teletraffic Conference, Paris, France
82. January 2010, "Some New(ish) Results in Information Theory", **Invited Lecture**, Programme on New Topics at the Interface Between Probability and Communications, Newton Institute for Mathematics, Cambridge, UK
83. January 2010, "Bringing Network Coding into the Network", **Invited Lecture**, Computer Laboratory Systems Research Group Seminar, Cambridge, UK
84. February 2010, "Some New Directions in Information Theory", **Invited Lecture**, Workshop on Frontiers of Controls, Games, and Network Science with Civilian and Military Applications, Austin, TX
85. May 2010, "On the practice of network coding. Bringing network coding into the network." **Keynote Lecture**, 5th IEEE International Symposium on Wireless Pervasive Computing, Modena, Italy
86. July 2010, "When network coding met the network", **Keynote Lecture**, International Conference on Infocomm Technology, Hanan, China
87. July 2010, "Some Perspectives on Scaling", **Plenary Presentation**, JTEN, MIT Lincoln Laboratory
88. November 2010, "Some New Directions for Network Coding in Content Distribution", **invited lecture**, Alcatel-Lucent
89. June 2011, "Applications du codage réseau pour la vidéo", **Invited Seminar**, Digiteo, Supelec, France
90. June 2011, "Network coding for quality of experience", **Keynote Lecture**, Annual GTTI Meeting, Italy, also
91. **Invited lecture**, EPFL Summer Research Institute, Switzerland
92. July 2011, "Wireless Networks in the Low and High SNR Regimes", **Invited Lecture**, ITMANET Information Exchange Meeting, Stanford
93. August 2011, "The High, the Low and the Ugly - on the Capacity of Wireless Networks", **invited lecture**, Hamilton Institute Network Science Workshop, Ireland.
94. September 2011, "Going Beyond Hybrid ARQ - Joint Channel and Network Coding for Body Area Networks", **E-seminar** to FRCP and Semiconductor Research Council

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95. February 2012, “When Coding Met Video QoE”, **Keynote Lecture**, IEEE International Conference on Computing, Networking and Communications, also
96. February 2012, **Invited Lecture**, Netapp
97. February 2012, “When Coding Met QoE - Making Network Coding Go From Theory to Practice”, **invited lecture**, University of Pennsylvania Communications Networks Seminar Series, also
98. March 2012, **Accenture Lecture Series**, SRM University (Chennai), NMIMS (Mumbai), Accenture Mumbai, Accenture Hyderabad, Accenture Bangalore 3, Accenture Bangalore
99. May 2012, “An Introduction to Network Coding”, **doctoral short course**, University of Modena
100. June 2012, “Network Coding: From Theory to Practice”, **tutorial**, ICC 2012, jointly with Frank Fitzek
101. June 2012, “Stitching it all together - Using Network Coding in Heterogeneous Settings”, **Keynote Lecture**, *Workshop on Cooperative and Cognitive Mobile Networks*, also
102. September 2012, **invited lecture**, CISCO also
103. November 2012, presentation for **MIT ILP Research and Development Conference**, also
104. December 2012, **Invited seminar**, UCSB ECE Department, also
105. February 2013, **ECE Colloquium**, University of Wisconsin Madison
106. June 2012, “Network resource use and Video QoE – a coding perspective”, **Keynote Lecture**, *Workshop on Realizing Advanced Video Optimized Wireless Networks*, ICC
107. September 2012, “When Coding Met QoE - Making Network Coding go from Theory to Practice”, **Keynote Lecture**, *Workshop on Challenges and Solutions for the Mobile Video Operator*
108. September 2012, “Wireless Network Coding – to PHY or not to PHY?”, **Plenary Lecture**, IEEE Vehicular Technology Conference, Quebec City, Canada
109. October 2012, “Jubilee Panel: The Ecology of Communication, Control, and Computing Research and Education”, **Panelist**, Allerton Conference
110. November 2012, “Network Coding – Theory and Applications”, **Ph.D. Short Course**, Aalborg University (co-taught with Frank Fitzek and Morten Pedersen)
111. November 2012, “To PHY or not to PHY - on the Capacity of Wireless Networks at Different Levels of SNR”, **D.W. Weeks Lecture**, MIT Department of Mathematics
112. February 2013, “Network Coding – A Rapid Tutorial”, **Tutorial**, 1st Workshop on Cognition and Control, University of Florida
113. February 2013, “Joint Source Channel and Network Coding - A Simple Ad-hoc Approach Inspired from Compressed Sensing”, **Invited Lecture**, 1st Workshop on Cognition and Control, University of Florida
114. February 2013, “A Bandwidth Breakthrough^[1]Recent developments in RLNC Technology”, **Webinar** to PCIA’s Innovation & Technology Council
115. March 2013, “Putting Algebra in the Network”, **Invited Lecture**, Brown University Symposium for Undergraduates in the Mathematical Sciences (SUMS)

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116. April 2013, “Career Paths, Life Paths”, **Panelist**, MIT GWAMIT (Graduate Women at MIT) Empowerment Conference
117. April 2013, “Network Coding – Where Should it Go?”, **Keynote Lecture**, IEEE/IFIP Wireless And Mobile Networking Conference, Dubai, also
118. **Invited Presentation**, Ericsson Research Laboratories, June 2013
119. May 2013, “5e forum Science - Recherche – Société”, organized by Le Monde and La Recherche, **Panelist**, Paris
120. June 2013, “Coding for Heterogeneous Networks”, **Keynote Lecture**, Cominlabs Week, Rennes
121. June 2013, “Network Coding”, **Tutorial**, ICC 2013, Budapest (co-taught with Frank Fitzek)
122. June 2013, “Clever Coding to Improve Network Performance for Mobile Video”, **Spotlight Presentation**, Technology Review Mobile Summit, San Francisco
123. June 2013, “On the Balance between Network Coding and Physical Layer Coding – Two Case Studies”, **Invited Presentation**, Cisco Laboratories Sunnyvale
124. June 2013, “Network Coded TCP - a Brief Overview”, **Invited Lecture**, Information Theory Forum, Stanford
125. June 2013, “On managing coding and acknowledgements at the transport layer - a couple of case studies”, **Invited IPG Seminar**, EPFL
126. July 2013, “Placing network coding in the network”, **Keynote Lecture**, ICCCN 2013, Dubai
127. August 2013, “Some Recent Topics for Coding in Secrecy”, **Invited Talk**, Dagstuhl Workshop on Coding, Germany
128. August 2013, “On the interaction between network coding and the physical layer”, **Plenary Lecture**, ISWCS 2013, Ilmenau, Germany
129. September 2013, “Network coded TCP for a faster Internet”, **Vice-Chancellor’s Lecture**, University of Auckland, New Zealand
130. October 2013, **panelist** for “Sustainability & ICT”, at the Telecommunications Industry Association Conference, Washington, D.C.
131. October 2013, “Placing network coding in the network”, **Hitachi Distinguished Lecture**, University of Oklahoma
132. November 2013, **Panelist**, “Fundamental performance limits for mobile ad-hoc networks”, MILCOM, San Diego
133. November 2013, “Network coding - where should it go?”, **Invited Seminar**, Cornell Tech, New York
134. December 2013, “Network Coding”, **Doctoral Course at University of Aalborg**, co-taught with Frank Fitzek, Daniel Lucani, Morten Pedersen
135. December 2013, “Performance Metrics and Protocols for Data Centers and SANs in Multimedia”, **Invited Talk**, DIMACS Workshop on Algorithms for Green Data Storage, Rutgers University

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136. January 2014, “Some Recent Topics in Coding for Secrecy”, **Invited Talk**, Second Workshop on Cognition and Control, University of Florida
137. February 2014, “On the interaction between network coding and the physical layer - information theoretic results and a case study”, **Plenary Lecture, ITA**, also **SILO Invited Lecture**, University of Wisconsin (February 2014), also
138. **Charles River Information Day Invited Presentation** (April 2014)
139. February 2014, “Some case studies of random network coding in distributed storage”, **Invited Lecture**, Qualcomm Research Center
140. April 2014, “Placing Algebra into the Network - Network Coding”, **IEEE Vehicular Technology Society Distinguished Lecture**, Rutgers University.
141. August 2014, “Network Coding”, **Doctoral Course** at University of Aalborg
142. August 2014, “Using Random Network Coding in Dynamic Environments”, **Invited Netapp Faculty Fellow Talk**, Netapp
143. September 2014, “Applications of random linear network coding (RLNC) to satellite communications”, **tutorial**, 7th Advanced Satellite Multimedia Systems Conference (ASMS) and 13th Signal Processing for Space Communications Workshop (SPSC)
144. September 2014, “Separating the errors from the network – some implications of equivalence theory on network coding”, **Invited Talk**, 4th International Castle Meeting on Coding Theory and Applications, 4ICMCTA
145. October 2014, “Placing Algebra in the Network”, **Boston Seminar Series**, run by the MIT Alumni Club
146. November 2014, panelist at the MIT Path of Professorship Workshop, Microsoft Center
147. November 2014, “Making networks better - from information theory to chips”, **Invited Seminar** at Harvard University
148. February 2015, “Implementation considerations for network coding in sensor networks,” **Keynote Lecture**, PECCS 2015 and SENSORNETS 2015, Angers, France
149. February 2015, Member of the Panel at the Doctoral Presentation Sessions, PECCS 2015 and SENSORNETS 2015, Angers, France
150. February 2015, “Using random linear network coding in dynamic storage environments”, **Invited Seminar**, Engineering Department, Cambridge University, also
151. February 2015, **IEEE Vehicular Technology Society Distinguished Lecture**, University of Manitoba, Winnipeg, Canada
152. April 2015, “Placing algebra in the network”, **IEEE Signal Processing and Communication Chapter Lecture**, Khalifa University
153. April 2015, “Stormy Clouds - Security in Distributed Cloud Systems”, **Invited Seminar** at Princeton University, also
154. May 2015, **Invited Lecture** Alcatel-Lucent Bell Labs, New Jersey, also
155. July 2015, **Keynote Lecture**, Science and Information Conference. London, UK also
156. August 2015, **Invited Lecture**, Annual September Meeting of the Irish Mathematical Society also

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157. October 2015, **Keynote Lecture** IEEE Local Computer Networks Conference
158. April 2015 “How New Cloud Networking, “Big Data”, and Wireless Communications May Affect Your Security, Privacy, and Surveillance – or Not”, **Tutorial**, The American College of Family Trial Lawyers, Washington, D.C.
159. May 2015, “Two Recent Information Theoretic Variations on the Theme of Patterns in Security”, **Pattern Theory Lunch Seminar Series**, Applied Mathematics Department, Brown University, also
160. February 2016, Advanced Networking Colloquium Distinguished Lecture Series, University of Maryland College Park, also
161. April 2016, **Invited Lecture**, “Two Recent Information Theoretic Variations on the Theme of Patterns in Security”, Colorado State University also
162. September 2016, **Plenary Presentation**, International Symposium on Turbo Codes & Iterative Information Processing, Brest, France
163. May 2015, “Network and Physical Layer Coding in Wireless Networks”, **Keynote Speech**, European Wireless Conference, Budapest
164. June 2015, “Network Coding: From Theory to Practice”, **tutorial**, ICC 2015, London, UK (given with Frank Fitzek).
165. August 2015, “Some Recent Applications of Information Theory to Surveillance, Security and Privacy”, **Distinguished Speaker Talk**, Complex and Adaptive Systems Laboratory, University College Dublin
166. August 2015. “Some Recent results on the Use of Network Coding in Dynamic Clouds”, **Invited Lecture**, Trinity College, Dublin
167. January 2016, **Invited Talk**, 4th Workshop on Cognition and Control, University of Florida
168. April 2016, **Invited Lecture**, “The Coding Matrix Reloaded”, First Shannon Conference on the Future of the Information Age, Nokia
169. April 2016, “Network coding - a personal account of combining theory and practice”, **University Distinguished Lecture Series in Information Sciences and Technology**, Colorado State, also
170. **Mercer Lecture**, RPI, (May 2016), also
171. **Plenary Lecture**, IEEE IFIP Networking (May 2016), also
172. **Seminar**, Tufts University (November 2016), also
173. **Distinguished Lecture**, George Washington University (February 2017), also
174. **ECE Seminar**, Carnegie-Mellon University (March 2017)
175. June 2016, **Plenary Lecture**, “Network Coding as a 5G Key Enabling Technology”, Seventeenth International Symposium on a World of Wireless, Mobile and Multimedia Networks, Workshop on Fifth Generation Wireless: From Bits to Packets, Coimbra, Portugal
176. September 2016, “Coding for Delay Reduction”, **Plenary Presentation**, 5G Day, Dresden, Germany

Publications of Muriel Médard

177. December 2016, **Panelist**, Women in Communication Engineering (WICE) Workshop, Washington, D.C.
178. December 2016, **Plenary Speaker**, “Heterogeneity for Keeps”, IEEE Globecom, Washington, D.C.
179. December 2016, “Stormy Clouds - ensuring security and privacy in distributed settings”, **Keynote Speech**, NSF JUNO meeting, Washington, D.C.
180. January 2017, “Coding for delay rather than throughput”, **Keynote Speech**, COMSNETS, Bangalore, India
181. April 2017, “Algebraic Network Coding”, **Invited Presentation**. Technical University of Dresden
182. May 2017, “Compressed Sensing and Network Coding”, **Invited Presentation**. Technical University of Dresden
183. June 2017. “Coding for computation”, **Invited Presentation**, Information Modeling and Control of Complex Systems Workshop, Ohio State University
184. June 2017, “Bringing Codes into Protocols: Some Principles and Applications”, **short course**, IEEE Information Theory Society Summer School, Georgia Tech
185. June 2017, “Guessing Revisited”, **Plenary Talk**, Canadian Workshop on Information Theory.

Theses Supervised by Muriel Medard

Summary

	Total	Completed	In Progress
Bachelor	0	0	0
Master of Engineering	18	18	0
Master of Science	27	26	1
Engineer	0	0	0
Doctoral			
As Supervisor	25	22	3
As Reader	47	46	1

Bachelor's Theses

None

Master's of Engineering Theses

Zheng, Changqing, "Optimum Spreading Bandwidth for DS-CDMA on Time and Frequency Fading Channels," May 2002

Rettig, Pascal, "Transmit Simulation and Receive Optimization for 802.11b Networks" (6-A student at Qualcomm), May 2002

Le Cocq, Cécile, "Delay Improvements from Multiple Wavelengths in an Optical Folded Bus," September 2003

Choute, Clifford, "Performance of Random Network Coding for Data Dissemination," (co-supervised with Supratim Deb), June 2005

Lee, Anna, "Simplified Random Network Codes for Multicast Networks," June 2005

Tang, Jianlong, "Secure Network Coding with a Cost Criterion," June 2006

Ebad Ahmed, "Economic Aspects of Network Coding", (co-supervised with Asuman Ozdaglar and Atilla Eryilmaz), June 2007

Minji Kim, "Network Coding for Speed-up in Switches," August 2007

Kim, Anthony, "On Network Coding Capacity - Matroidal Networks and Network Capacity Region", September 2010 (co-supervised with Una-May O'Reilly)

Teerapittayanon, Au, "Performance Enhancements in Next Generation Wireless Networks Using Network Coding: A Case Study in WiMAX", May 2012 (co-supervised with Marie-Jose Montpetit and Kerim Fouli)

Zhang, Amy, "A Functional Flow Framework for Cloud Computing", May 2012

Rambeloarison, Muriel, "Empirical Rate-Distortion Study of Compressive-Sensing based Joint Source-Channel Coding", May 2012

Theses Supervised by Muriel Medard

Urbina, Leo, “Applying Network Coding to TCP”, May 2012 (co-supervised with Minji Kim)

Colosimo, Joseph, “chanem: A Doppler-Shifting Channel Emulator”, May 2013 (co-supervised with Matthew Kercher of MIT Lincoln Laboratory)

Sergeev, Ivan, “Network Coding for Anonymous Broadcast”, May 2013

Josephson, Colleen, “Anonymity Properties of Two Network Coded Gossip Protocols “, August 2014

Yu, Qian, “Finding the Optimal Demodulator Under Implementation Constraints”, (co-supervised with Jason Pearce of Maxim Integrated), June 2015

Gurram, Neil, “Understanding Stutter Artifacts Present in Capillary Electropherogram Readouts”, May 2016 (co-supervised with Ken Duffy of Maynooth University)

Master’s of Science Theses

Saengudomlert, Poompat, “Analysis and Detection of Jamming Attacks in an All-optical Network,” June 1998 (co-supervised with Robert G. Gallager)

Huang, Jianyi, “Capacity of Time-slotted ALOHA Systems,” June 2000, University of Illinois Urbana-Champaign (co-supervised with Sean P. Meyn)

He, Wenbo, “Heuristic Algorithms for Failure Recovery in Mesh Networks,” August 2000, University of Illinois Urbana-Champaign

Wang, Hung Jen, “Routing Policy on Robustness in Optical Networks,” March 2002 (co-supervised with Eytan Modiano)

Libarikian, Ari, “Robustness of Bus Overlays in Optical Networks,” April 2002, **winner of a MIT Masterworks (one of 9 in EECS)**

Coleman, Todd, “Trade-off Between Power Consumption and Delay in Wireless Packetized Systems,” April 2002, **winner of the Morris J. Levin Award (First Prize) at the MIT Masterworks**

Lun, Desmond, “Error Exponent for Multipath Fading Channels: Strong Coding Theorem,” September 2002 (co-supervised with Ibrahim Abou-Fayçal)

Weichenberg, Guy, “High-Reliability Architectures for Networks Under Stress,” June 2003 (co-supervised with Vincent Chan)

Kim, Minkyu, “Robustness in Large-Scale Random Networks,” June 2003

Theses Supervised by Muriel Medard

Ray, Siddharth, “Achievable Rates Over Bursty Multiple-Access Noise-Free Channels,” September 2003 (co-supervised with Jinane Abounadi)

Youssef-Massaad, Pamela, “Impact of processing energy on the capacity of wireless channels,” started Fall 2003 (co-supervised with Lizhong Zheng)

Sundararajan, Jay Kumar, “Extending the Birkhoff-von Neumann Switching Strategy to Multicast Switching” June 2005 (co-supervised with Supratim Deb), **winner of a Morris J. Levin Award at the MIT Masterworks**

Jing, Sheng, “On Sounding in Wideband Channels,” June 2006, (co-supervised with Lizhong Zheng)

Doshi, Vishal, “Functional Compression: Theory and Applications”, February 2008 (co-supervised with Devavrat Shah)

ParandehGhebi, Ali, “Fair Resource Allocation in Multiple Access Channels”, June 2008 (co-supervised with Asuman Ozdaglar)

Shi, Shirley, “Joint Base-Calling of Two DNA Sequences with Factor Graphs”, September 2009 (co-supervised with Desmond Lun from the Broad Institute)

Feizi-Khankandi, Soheil, “Network Functional Compression”, June 2010, **Ernst Guillemin SM Thesis Second Prize**

Cloud, Jason, “Cross-Layer Design with Multi-Packet Reception, MAC, and Network Coding in Multi-Hop Networks”, June 2011 (co-supervised with Linda Zeger from MIT Lincoln Laboratory)

Arman Rezaee, Network Coding, Multi-Packet Reception, and Feedback: Design Tools for Wireless Broadcast Networks”, August 2011 (co-supervised with Linda Zeger from MIT Lincoln Laboratory)

Angelopoulos, Georgios, “Energy-Aware Network Coding Circuit and System Design”, June 2011 (co-supervised with Anantha Chandrakasan)

Zeng, Weifei, “Coding and Scheduling Optimization over Packet Erasure Broadcast Channels”, January 2012

Wang, Tong (Ada), “Joint Design of Multi-resolution Codes and Intra/Inter-layer Network Coding”, May 2012 (co-supervised with Lizhong Zheng)

Makhdoumi Kankhani, Abbasali, “Locally Decodable Source Coding”, May 2013 (co-supervised with Yury Polyanskiy)

Adams, David, “A Delay-Constrained Cross-Layer Model Using Network Coding”, June 2014 (co-supervised with Chris Yu at Draper Labs and Jinfeng Du)

Theses Supervised by Muriel Medard

Salman Salamatian, ““A Successive Description of Monotone-chain Polar Codes for Slepian-Wolf Coding, and its Application to Separation of Source and Network Coding”, co-supervised at EPFL with Emre Telatar

Whisman, Daniel, “Benefits of Opportunistic Routing, Implicit Acknowledgments, and Network Coding on a Linear Broadcast Network”, May 2016

Kose, Alper, co-supervised at EPFL with Emre Telatar.

Engineers Theses

None

Doctoral Theses, Supervisor

Ho, Tracey, “Networking from a Network Coding Perspective,” May 2004. Committee: David Karger, Ralf Koetter (UIUC), Michelle Effros (Caltech), **received an Honorable Mention from the George M. Sprowls Award for the best doctoral theses in computer science**

Peranginangin, Nathanael, “On Capacity of Relay Networks with Finite Memory Relays,” September 2004. Committee: Robert G. Gallager, Ralf Koetter (UIUC), Vincent Chan.

Luo, Cheng, “Communication for Wideband Fading Channels: on Theory and Practice,” (co-supervised with Lihong Zheng), October 2005. Committee: Greg Wornell, Vincent Chan, Dennis Goeckel (University of Massachusetts Amherst).

Coleman, Todd, “Low-Complexity Approaches to Distributed Data Dissemination,” November 2005. Committee: John Tsitsiklis, Ralf Koetter (UIUC), Michelle Effros (Caltech), Andrea Goldsmith (Stanford).

Lun, Desmond, “Efficient Operation of Coded Packet Networks,” June 2006. Committee: John Tsitsiklis, Ralf Koetter (UIUC), Michelle Effros (Caltech).

Ray, Siddharth, “Energy-Efficient Multiple Antenna Communication”, (co-supervised with Lihong Zheng), August 2006. Committee: Pierre Moulin (UIUC), Pramod Viswanath (UIUC).

Kim, Minkyu, “Evolutionary Approaches Toward Practical Network Coding (co-supervised with Una-May O’Reilly), September 2008. Committee: Michelle Effros (Caltech).

Weichenberg, Guy, “Design and Analysis of Optical Flow Switched Networks” (co-supervised with Vincent Chan), January 2009. Committee: Eric Swanson (independent consultant).

Sundararajan, Jay-Kumar, “On the Role of Feedback in Network Coding”, (co-supervised with Devavrat Shah), August 2009. Committee: Michel Goemans.

Sheng, Jing, “Towards Unifying Multi-Resolution and Multi-Description - A Distortion-Diversity Perspective”, September 2009, (co-supervised with Lihong Zheng), Committee: Vahid Tarokh (Harvard).

Zhao, Fang, “Distributed Control of Coded Networks”, October 2009. Committee: Asuman Ozdaglar and Desmond Lun (Rutgers University)

Theses Supervised by Muriel Medard

Lucani, Daniel, “Network Coding for Delay Challenged Environments” (co-supervised with Milica Stojanovic (Northeastern University)), March 2010. Committee: Vincent Chan.

Kim, Minji, “Network Coding for Robust Wireless Networks”, December 2011. Committee: Dina Katabi and João Barros (University of Porto)

ParandehGheibi, Ali, “Metrics, Fundamental Trade-offs and Control Policies for Delay-sensitive Applications in Volatile Environments”, (co-supervised with Asu Ozdaglar), December 2011. Committee: Stephen Boyd (Stanford) and R. Srikant (UIUC).

Shi, Shirley, “Energy Aware Network Coding in Wireless Networks”, August 2012. Committee: Anantha Chandrakasan and Dina Katabi.

Bernhard Haeupler, “Probabilistic Techniques for Distributed Information Dissemination” (co-supervised with David Karger and Jonathan Kelner), May 2013. Committee: Madhu Sudan and Robert Tarjan (Princeton), **received the 2014 Distributed Computing Dissertation Award, sponsored jointly by the ACM Symposium on Principles of Distributed Computing (PODC) and the EATCS Symposium on Distributed Computing (DISC)**

Ulric Ferner, “Toward sustainable networking: Coded storage and high-traffic networks”, May 2014. Committee: David Karger, Parastoo Sadeghi (Australian National University), Emina Soljanin (Alcatel-Lucent Bell Labs).

Calmon du Pin, Flavio, “Information-Theoretic Metrics for Security and Privacy” (co-supervised with Yury Polianskiy), August 2015. Committee: Ken Duffy (Maynooth University, Ireland), Shafi Goldwasser, Mayank Varia (Boston University).

Soheil Feizi, (co-supervised with Manolis Kellis) “On the Analysis of Complex Networks: Fundamental Limits, Scalable Algorithms, and Applications”, November 2015, Committee: Prof. Ken Duffy (Hamilton Institute, Maynooth University). Brendan Frey (University of Toronto), Ali Jadbabaie (University of Pennsylvania), Robert Nowak (University of Wisconsin-Madison).

Angelopoulos, Georgios, “Improving the reliability and energy efficiency of wireless sensor networks using coding techniques” (co-supervised with Anantha Chandrakasan), December 2015, Committee: Andrea Goldsmith (Stanford).

Zeng, Weifei, “Linear Algebraic Approaches To Coding for Multiple Unicast Networks”, February 2016, Committee: Viveck. R. Cadambe (Penn State), Lizhong Zheng, Kannan Ramchandran (Berkeley).

Cloud, Jason, “Increasing Quality of Service Using Transport Layer Coding Over Parallel Heterogeneous Networks”, June 2016, Committee: Vincent Chan, Aradhana Narula-Tam, Douglas Leith (Trinity College).

Abdrashitov, Vitaly, started Fall 2011

Makhmoudi Kankhani, Abbasali, started Fall 2013 (co-supervised with Asuman Ozdaglar)

Theses Supervised by Muriel Medard

Salman Salamatian, started Fall 2015.

Doctoral Theses, Reader

Visotsky, Yevgeny, "Space-time Transmit Precoding and Interference Suppression for a Wireless Downlink," June 2000 (supervised by Upamanyu Madhow), University of Illinois Urbana-Champaign

Abou-Fayçal, Ibrahim, "An Information Theoretic Study of Reduced Complexity Receivers for Intersymbol Interference Channels," January 2001 (supervised by Amos Lapidoth)

Yeh, Edmund, "Successive Decoding in Multiple-user Communications," June 2001 (supervised by Robert G. Gallager)

Klein, Thierry, "Capacity of Gaussian Noise Channels with Side Information and Feedback," June 2001 (supervised by Robert G. Gallager)

Laneman, Nicholas, "Cooperative Diversity in Wireless Networks: Algorithms and Devices," July 2002 (supervised by Greg Wornell)

Roy, Sandip, "Moment Linear Stochastic Systems and Their Applications," June 2003 (supervised by George Verghese)

Yao, Huan, "Efficient Signal, Code, and Receiver Designs for MIMO Communication Systems," June 2003 (supervised by Greg Wornell)

Min, Rex, "Energy and Quality Scalable Wireless Communication," June 2003 (supervised by Anantha Chandrakasan)

Shulman, Nadav, "Communication over an Unknown Channel via Common Broadcasting," July 2003 (supervised by Meier Feder), Tel Aviv University

De Couto, Douglas, "High-Throughput Routing for Multi-Hop Wireless Networks," May 2004 (supervised by Robert Morris)

Huang, Jianyi, "Characterization and Computation of Optimal Distributions for Channel Coding," August 2004 (supervised by Sean Meyn), University of Illinois Urbana-Champaign

Wu, Xin Zhou, "Wireless Communications in the Energy-Limited Regime," October 2004 (supervised by R. Srikant), University of Illinois Urbana-Champaign

Rasala-Lehman, April, "Network Coding," January 2005 (supervised by Madhu Sudan)

Gentry, Sommer, "Dancing Cheek to Cheek: Haptic Communication between Partner Dancers and Swing as a Finite State Machine," June 2005 (supervised by Eric Feron)

Chen, Li-Wei, "A Study on the Tradeoff between Efficient Resource Allocation and Node Complexity in WDM Optical Networks," August 2005 (supervised by Eytan Modiano)

Jaggi, Siddharth, "Design and Analysis of Network Codes," November 2005 (supervised by Michelle Effros), California Institute of Technology

Khalili, Ramin, "On the Properties of the Packet Layer Transmission," December 2005 (supervised by Kaveh Salamatian), Université Pierre et Marie Curie, France

Theses Supervised by Muriel Medard

Sicot, Guillaume, “Etude du codage dans l’ADN,” June 2006 (supervised by Ramesh Pyndiah), l’Ecole Nationale Supérieure de Télécommunications de Bretagne, France

Sethuraman, Vignesh, “On Non-Coherent Communication over Correlated Fading Channels with Practical Power Constraints,” July 2006 (supervised by Bruce Hajek), University of Illinois Urbana-Champaign

Ratnakar, Narajan, “On Joint Resource Allocation and Network Coding in Networks of Point to Point Links and on Multicasting in Aref Networks”, August 2006 (supervised by Ralf Koetter), University of Illinois Urbana-Champaign

Miliou, Natalia, “On Error Exponents for Fading Channels and Network Coding for Wireless Networks,” April 2007 (supervised by Amos Lapidoth), ETH Zurich, Switzerland

Piantanida, Pablo, “Multi-User Information Theory: State Information and Imperfect Channel Knowledge,” May 2007 (supervised by Pierre Duhamel), University of Paris-Sud XI (Supélec), France

Edalat, Farinaz, “Real-time Sub-carrier Adaptive Modulation and Coding in Wideband Orthogonal Frequency Division Multiplexing Wireless Systems”, December 2007 (supervised by Charles Sodini)

Wen, Yonggang, “Efficient Fault Management Architecture for Cost-Optimized Dynamic All-Optical Networks: A Systematic Approach”, December 2007 (supervised by Vincent W.S. Chan)

Katti, Sachin, “Network Coded Wireless Architecture”, September 2008 (supervised by Dina Katabi)

Chirawat Kotcharsan, “Robust Joint Transmitter and Receiver Power Allocation for Multi-user Communications”, July 2008 (supervised by Poompat Saengulomlert), Asian Institute of Technology, Thailand

Fawaz, Nadia, “Cooperative Communications for Wireless Ad Hoc Networks”, December 2008 (supervised by Mérouane Debbah and David Gesbert), Eurecom/ Supélec, France

Sundaram, Shreyas, “Linear Iterative Strategies for Information Dissemination and Processing in Distributed Systems”, April 2009 (supervised by Chris Hadjicostis), University of Illinois Urbana-Champaign

Kim, Sang Joon, “Performance bounds for bi-directional relaying protocols”, April 2009 (supervised by Vahid Tarokh), Harvard

Kabat, Andrzej, “Contributions au Codage Correcteur d’Erreurs: Décodage Pondéré des Codes de Reed-Solomon et Codage Distribué pour les Communications Coopératives Sans Fil”, October 2009 (supervised by Ramesh Pyndiah), Bretagne Télécom, France

Mahmino, Ali, “Applications du Codage Réseau aux Architectures aux Garanties de Qualité de Service (QoS)”, February 2010 (supervised by Jérôme Lacan), Université de Toulouse, France

Tirronen, Tuomas, “Fountain Codes: Performance Analysis and Optimisation”, March 2010 (supervised by Jorma Vitarmo), Helsinki University of Technology

Traskov, Danail “Network Coding for Multiple Access”, October 2010 (supervised by the late Ralf Koetter, later by Norbert Hanik), Technical University of Munich

Theses Supervised by Muriel Medard

Lima, Luisa, “Network Coding Security Algebraic Properties and Lightweight Solutions”, December 2010 (supervised by João Barros), University of Porto

Tomozei, Dan-Cristian “Distributed Algorithms for Peer-to-Peer Networks”, February 2011 (supervised by Laurent Massoulié), Université Pierre et Marie Curie

Fashandi, Shervan “Diversity and Reliability in Erasure Networks: Rate Allocation, Coding, and Routing”, December 2011 (supervised by Amir Khandani), University of Waterloo

Gollakota, Shyamnath, “Embracing Interference in Wireless Systems”, September 2012 (supervised by Dina Katabi)

Xu, YuanYuan , “Issues on Multiple Description Coded Video Communications: Coding, Routing and Scheduling”, September 2012 (supervised by Xhu Ce), Nanyang Technological University

Heidarzadeh, Anoosheh, “Design and Analysis of Random Linear Network Coding Schemes: Dense Codes, Chunked Codes and Overlapped Chunked Codes”, December 2012 (supervised by Amir H. Banihashemi), Carleton University

Wang, Yuhui, “On the Use of Network Coding and Multicast for Enhancing Performance in Wired Networks”, May 2013 (supervised by Eitan Altman, Eric Gourdin and Tijani Chahed), Télécom Paris Sud and Université Pierre et Marie Curie

Thakur, Mohit, “Relay Positioning for Multicast Relay Networks”, March 2014 (supervised by Gerhard Kramer), Technical University of Munich

Medina Ruiz, Hamlet “TCP and Network Coding: Equilibrium and Dynamic Properties”, July 2014 (supervised by Michel Kieffer and Béatrice Pesquet), Université Paris-Sud

Shrestha, Neetya, “Inter-session Network Coding for Delay Tolerant Mobile Social Networks”, April 2015 (supervised by Lucile Sassatelli), Université Nice Sophia Antipolis

Wang, Qiwen, “On Information-Theoretic Limits on Network Error Correction and Field Updates”, August 2015 (supervised by Robert Lee and Sid Jaggi), Chinese University of Hong Kong

Swaminathan, Harish, “Interpreting Complex, Low Template Forensic DNA Samples, September 2015 (supervised by Desmond Lun), Rutgers, The State University of New Jersey

Riemensberger, Maximilian Josef, “Submodular Rate Region Models for Multicast Communication in Wireless Networks”, October 2016, (supervised by Wolfgang Utschik), Technical University of Munich

Anderson, Grant , “Body Coupled Communication: The Channel and Implementation”, March 2017 (supervised by Charlie Sodini)

Shorki-Ghadikolaei, Hossein, “Millimeter-wave Networking: Fundamental Limits, Scalable Algorithms, and Design Insights”, June 2017, (supervised by Carlo Fischione), KTH Royal Institute of Technology in Stockholm, Sweden

Karzand, Mina, “Theoretical Study of Two Prediction-Centric Problems: Graphical Model Learning and Recommendations”, August 2017 (supervised by Lizhong Zheng and Guy Bresler)

Pinals, Lisa (supervised by Mai Vu), Tufts University.

Theses Supervised by Muriel Medard

Postdoctoral Fellows Supervised by Muriel Medard

Postdoctoral Fellows Supervised

Current Postdocs

<u>Name</u>	<u>PhD Granting Institution</u>
Prakash Narayana Moorthy	Indian Institute of Science
Wasim Huleihel	Technion
Jiange Li	University of Delaware

Previous Postdocs

<u>Name</u>	<u>Current Title</u>	<u>Current Employer</u>
Lucille Sasatelli	Assistant Professor	Eurecom
Chris Ng	Member of Tech. Staff	Alcatel Lucent Bell Labs
Atilla Eryilmaz	Associate Professor	Ohio State University
Siddarth Jaggi	Assistant Professor	Chinese University of Hong Kong
Supratim Deb	Member of Tech. Staff	AT&T Labs
Ibrahim Abou-Fayçal	Associate Professor	American Univ. of Beirut
Nadia Fawaz	Staff Engineer	LinkedIn
Danail Traskov	Consultant	Bain
Minji Kim	Member of Tech. Staff	Oracle
Ali ParandehGheibi	Member of Tech. Staff	Plexxi
Kerim Fouli	VP Technology	CodeOn
Viveck Cadambe	Assistant Professor	Penn State
Ullrich Mönich	Researcher	TUM
Ying Cui	Assistant Professor	Shanghai Jiao Tong University
Jinfeng Du	Member of Tech. Staff	Nokia.
Jason Cloud	Manager	Dolby Laboratories
	Sound/Systems Group	
Ahmad Beirami	Postdoctoral Fellow	Harvard University.