

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
School of Engineering Faculty Personnel Record

Date: January, 2005

Name: Muriel Médard
Department: Electrical Engineering
and Computer Science

1. Date of Birth: February 1, 1968

2. Citizenship: US

3. Education:

School	Degree	Date
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

4. Title of Sc.D. Thesis:

The Capacity of Multiple User Time Varying Channels in Wireless Communications.

5. Principal Fields of Interest:

Information Theory. Networks, Communications.

6. Name and Rank of Other Faculty in the Same Field:

Vincent W. S. Chan, Professor
Robert G. Gallager, Professor
Jeffrey H. Shapiro, Professor
G. David Forney, Adjunct Professor
David Karger, Associate Professor
Gregory W. Wornell, Professor
Lizhong Zheng, Assistant Professor

7. Name and Rank of Faculty in Other Departments in the Same Field

Eytan Modiano, Associate Professor without tenure (Aeronautics and Astronautics)
Moe Win, Associate Professor without tenure (Aeronautics and Astronautics)

8. Non-MIT experience:

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

9. History of MIT Appointments:

Rank	Beginning	Ending
MIT Lincoln Laboratory Staff Member	September 1995	June 1998
Assistant Professor	January 2000	January 2003
Associate Professor (without tenure)	January 2003	present

10. Consulting Record:

Firm	Beginning	Ending
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

11. Department and Institute Committees, Other Assigned Duties:

<u>Activity</u>	<u>Beginning</u>	<u>Ending</u>
Graduate Counselor (Dept)	September 2000	present
Graduate Admissions Reader (Dept) (domestic and international, for different years: Africa and Australia; Korea; China and Taiwan)	December 2000	present
House Fellow, Green Hall (Institute)	September 2001	August 2002
Associate House Master, Simmons Hall (Institute)	March 2002	present
Undergraduate Admissions Reader (Institute)	January 2004	January 2004
Organized "Meet Course VI" outreach event (Dept)	Fall 2003, Fall 2004	
Lemelson Prize Committee (Institute)	Fall 2000	
Sprowls Award Committee (Dept)	Spring 2003	
Baker Housemaster Search Committee (Institute)	Fall 2004	
EECS Graduate Admissions Coordinator for Areas I and VII (Dept)	Fall 2004	present

12. 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 2004 IEEE International Symposium on Information Theory	2002	2004
Session Organizer, Wireless Communications and Networking Conference, 2003	2002	2002
Technical Program Committee member for the	2002	2003

International Workshop on Design of Reliable Communication Networks (DCRN) 2003 (IEEE)		
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 Career review panelist	2002, 2003	
Co-organizer of the new Network Coding track for the Allerton Conference on Communication, Control, and Computing,	2003	present
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	present
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	present
Treasurer, IEEE Information Theory Society	2004	present
Co-organizer of an invited session on Network Coding for the 38th Annual Conference on Information Sciences and Systems, Princeton University	2003	present
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	present
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	present
Guest Editor, Joint Special Issue of the <i>IEEE Transactions on Information Theory</i> and the <i>IEEE/ACM Transactions on Networking</i> on Networking and Information Theory	2004	present
Technical Program Committee Member, Symposium on Information Theory of Wireless Networks, as part of IEEE WirelessCom 2005	2004	present
Technical Program Committee Member for the 2006 IEEE International Symposium on Information Theory	2004	present

Technical Program Committee member for the International Workshop on Design of Reliable Communication Networks (DCRN) 2005 (IEEE)	2004	present
Technical Program Committee member for Broadnets 2005	2005	present
Technical Program Committee Co-Chair for the 2007 IEEE International Symposium on Information Theory	2004	present

13. 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 for M. Médard, "The Effect Upon Channel Capacity in Wireless Communications of Perfect and Imperfect Knowledge of the Channel," IEEE Transactions on Information Theory, Volume 46 Issue 3, May 2000, Pages: 935-946.	2002
Recipient of a 2003 Esther and Harold E. Edgerton MIT Chair	2002
Best Paper Award for G. Weichenberg, V. Chan, M. Médard, "Reliable Architectures for Networks Under Stress," Fourth International Workshop on the Design of Reliable Communication Networks (DRCN 2003), October 2003, Banff, Alberta, Canada	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

14. Current Organization Membership:

<u>Organization</u>	<u>Offices Held</u>
IEEE Information Theory Society	Treasurer, starting January 2004
IEEE (senior member)	
Eta Kappa Nu	
Tau Beta Pi	
Sigma Xi	

15. Patents and Patent Applications Pending:

1. M. Médard, S.G. Finn, R.A. Barry, R.G. Gallager., "Method and Apparatus for Automatic Protection Switching," Patent # 6,047,331
2. M. Médard et al. "A Pseudorandom Noise Sequence Noise Generator," patent # 6,201,870
3. M. Médard, S.R. Chinn., "Method and Apparatus for Detecting Security Attacks in Communication Networks," Patent # 6,507,012 and # 6,507,012 B1
4. M. Médard, S.R. Chinn., "Method and Apparatus for Detecting Security Attacks in Communication Networks," Patent # 6,603,112
5. R. Bergman, M. Médard, "Fault Isolation for Communication Networks for Isolating the Source of Faults Comprising Attacks, Failures, and Other Network Propagating Errors," Patent # 6,442,694
6. S. Lumetta, M. Médard, "Fault Tolerant Optical Data Communication Network," filed 2002, Application #10/186,178
7. S.R. Chinn, S. Lumetta, M. Médard, "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," filed 2002, patent pending
8. G. Ciancaglini et al., "Fault Tolerant Optical Data Communication Network Having Auto Discovery," filed 2002, patent pending
9. M. Garofalo et al., "Multiple Switch Protected Architecture," filed 2002, patent pending
10. M. Médard et al., "Method and Apparatus for Medium Access Control for a Communications Network," filed 2003, patent pending
11. T. Ho, R. Koetter, M. Médard, D. Karger, N. Effros, "Randomized Distributed Network Coding Method and Apparatus," provisional patent application
12. D.S. Lun, M. Médard, T. Ho, R. Koetter, "Minimum Cost Routing with Network Coding," provisional patent application
13. S. Deb, M. Médard, "A Network Coding Approach to Rapid Information Dissemination," provisional patent application
14. S. Deb, M. Médard, R. Koetter, "A Random Linear Coding Approach to Distributed Data Storage," provisional patent application
15. G. Ciancaglini et al., "Method and Apparatus for Provisioning Connection Oriented, Quality of Service Capabilities and Services," patent application

16. T. Ho, B. Leong, R. Koetter, D. Karger, M. Médard, M. Effros, “Byzantine Modification Detection in Multicast Networks Using Randomized Network Coding,” provisional patent application

16. Professional Registration: NA

17. Major New Products: NA

Teaching and Educational Contributions of Muriel Médard

1. Teaching Experience

Term	Subject Number	Title	Role	Course Type	Course evaluation survey given
FT 98	ECE 434 (University of Illinois Urbana-Champaign)	Random Processes	Lecturer, in charge	Graduate Course	
ST 99	ECE467 (UIUC)	Communication Network Analysis	Lecturer, in charge	Graduate Course	
FT 99	ECE 313 (UIUC)	Probability with Engineering Applications	Lecturer, co-in charge	Undergraduate Course	
ST 00	6.441	Transmission of Information	Lecturer, in charge	Graduate Course	Yes
FT 00	6.263/16.37	Data Communication Networks	Lecturer, co-in charge	Graduate Course	Yes
FT 01	6.041/6.431	Probabilistic Systems Analysis & Applied Probability	Lecturer, in-charge	Undergraduate and Graduate Course	Yes
ST 02	6.441	Transmission of Information	Lecturer, in charge	Graduate Course	Yes
FT 02	6.041/6.431	Probabilistic Systems Analysis & Applied Probability	Lecturer, in-charge	Undergraduate and Graduate Course	Yes
FT 03	6.263/16.37	Data Communication Networks	Lecturer, co-in charge	Graduate Course	Yes
IST 04	6.441	Transmission of Information	Lecturer, in charge	Graduate Course	Yes
FT 04	6.041/6.431	Probabilistic Systems Analysis & Applied Probability	Recitation instructor	Undergraduate and Graduate Course	Yes

Teaching and Educational Contributions of Muriel Médard

2. Teaching Evaluation Data

Term	Subject Number	Total # students registered	Total # survey responses	Survey Form Used	Instructor Teaching Quality Average	Overall Course Quality Average
FT 00	6.263/ 16.37	30	28	EECS	4.0	4.8
FT 01	6.041/ 6.431	256	117	EECS	3.9	4.6
ST 02	6.441	30	14	EECS	6.4	6.4
FT 02	6.041/ 6.431	229	54	EECS	4.4	4.6
FT 03	6.263/ 16.37	17	11	EECS	6.0	5.6
ST 04	6.441	9	6	EECS	5.7	5.5
FT 04	6.041/ 6.431	200 (55 in recitation)	36 (out of 55 in recitation)	EECS	4.7	5.3 (for 6.041 overall)

3. Other Educational Contributions

a) Teaching materials

- i. In 6.441, 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
- ii. In 6.263, 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

b) Other education contributions:

- i. Summer Professional Institute: co-instructor for 6.20S, Digital Communication Networks; significantly updated the curriculum
- ii. Developed a new one-day course on network coding in conjunction with Ralf Koetter of UIUC and Phil Chou of Microsoft; the course was given at Centre for Wireless Communications at the University of Oulu and at the IEEE Global Telecommunications Conference (Globecom)

Publications of Muriel Médard

1. Books: N.A.

2. Papers in Refereed Journals:

1. M. Médard, D. Marquis, R.A. Barry, S.G. Finn, "Security Issues in All-Optical Networks," IEEE Network Magazine, Volume 11, Issue 3, May 1997, pp. 42-48.
2. M. Médard, S.R. Chinn, P. Saengudomlert, "Attack Detection in All-Optical Networks," in Trends in Optics and Photonics (TOPS) – Volume 20 - Optical Networks and their Applications, R.A. Barry, editor, published by the Optical Society of America, 1998, pp. 227-232 **
3. S.G. Finn, M. Médard, R.A. Barry, "A New Algorithm for Bi-directional Link Self-Healing for Arbitrary Redundant Networks," in Trends in Optics and Photonics (TOPS) – Volume 20 - Optical Networks and their Applications, R.A. Barry, editor, published by the Optical Society of America, 1998, pp. 222-226
4. M. Médard, R.A. Barry, S.G. Finn, R.G. Gallager, "Automatic Protection Switching for Multicasting in Optical Mesh Networks," in Trends in Optics and Photonics (TOPS) – Volume 20 - Optical Networks and their Applications, R.A. Barry, editor, published by the Optical Society of America, 1998, pp. 216-221
5. M. Médard, S.G. Finn, R.A. Barry, R.G. Gallager, "Redundant Trees for Preplanned Recovery in Arbitrary Vertex-Redundant or Edge-Redundant Graphs," IEEE/ACM Transactions on Networks, Volume 7, Issue 5, October 1999, pp. 641 -652
6. M. Médard, "The Effect Upon Channel Capacity in Wireless Communications of Perfect and Imperfect Knowledge of the Channel," IEEE Transactions on Information Theory, Volume 46, Issue 3, May 2000, pp. 935-946 (Winner of the IEEE 2002 Leon Kirchmayer Prize Paper Award)
7. S. Lumetta, M. Médard, Y. Tseng, "Capacity Versus Robustness: A Tradeoff for Link Restoration in Mesh Networks," IEEE Journal of Lightwave Technology, Volume 18, Issue 12 , March 2001, pp. 1765 -1775 **
8. M. Médard, S.R. Chinn, P. Saengudomlert, "Node Wrappers for QoS Monitoring in Transparent Optical Nodes," Journal of High Speed Networks, 2001 (yearly publication) , IOS Press, pp. 247-268 **
9. M. Médard, S.S. Lumetta, "Architectural Issues for Robust Optical Access," IEEE Communications Magazine, Volume 39, Issue 7, July 2001, pp. 116-220

** Outgrowth of supervised student research

Publications of Muriel Médard

10. M. Médard, R.A. Barry, S.G. Finn, W. He, S.S. Lumetta, "Generalized Loop-back Recovery in Optical Mesh Networks," *IEEE/ACM Transactions on Networking*, Volume 10, Issue 1, February 2002, pp. 153-164 **
11. M. Médard, R.G. Gallager, "Bandwidth Scaling for Fading Multipath Channels," *IEEE Transactions on Information Theory*, Volume 48, Issue 4, April 2002, pp. 840-852
12. P. Saengudomlert, M. Médard, "Guaranteeing BER in Transparent Optical Networks Using OOK Signaling," *IEEE Journal on Selected Areas in Communications*, Volume 20, Issue 4, May 2002, pp. 786-799 **
13. M. Médard, S.S. Lumetta, L. Li, "A Network Management Architecture for Robust Packet Routing in Mesh Optical Access Networks," invited paper in *IEEE Journal on Selected Areas in Communications*, Volume 20, Issue 4, May 2002, pp. 822-833
14. R. Koetter, M. Médard. "Beyond Routing: An Algebraic Approach to Network Coding," *IEEE/ACM Transactions on Networking*, Volume 11, Issue 5, October 2003, pp. 782-796 (selected as one of the outstanding papers from INFOCOM for transfer to *IEEE/ACM Transactions on Networking*)
15. M. Jinno, F.J. Leonberger, M. Médard, N. Ransom, A. Von Lehmen, "Guest Editorial: Optical Networks," *IEEE Journal of Lightwave Technology*, Volume 21, Issue 11, November 2003, pp. 2452 – 2454
16. M. Médard, "Channel Uncertainty in Communications," invited paper in *IEEE Information Theory Society Newsletter*, June 2003
17. M. Médard, J. Huang, A. Goldsmith, S. Meyn, T.P. Coleman, "Capacity of Time-slotted ALOHA Packetized Multiple-Access Systems over the AWGN Channel," *IEEE Transactions on Wireless Communications*, Volume 3, Issue 2, March 2004, pp. 486 - 499 **
18. D. S. Lun, M. Médard, I. C. Abou-Fayçal, "On the Performance of Peak Capacity-achieving Signaling on Multipath Fading Channels," *IEEE Transactions on Communications*, Volume 52, Issue 6, June 2004, pp. 931 - 938**
19. T.P. Coleman, M. Médard, "A Distributed Scheme for Achieving Energy-Delay Tradeoffs with Multiple Service Classes over a Dynamically Varying Network," *IEEE Journal on Selected Areas in Communications: Advanced Mobility Management and QoS Protocols for Wireless Internet*, Volume 22, Issue 5, June 2004, pp. 929-941 **

Publications of Muriel Médard

20. G. E. Weichenberg, V. W. S. Chan, M. Médard, "High-Reliability Topological Architectures for Networks under Stress," IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series, Volume 22, Issue 9, November 2004, pp.1830 - 1845**
 21. T. Ho, M. Médard, R. Koetter, "An Information Theoretic View of Network Management," accepted to IEEE Transactions on Information Theory **
 22. D. Karger, M. Médard, "Toward Using the Network as a Switch," accepted to IEEE Journal on Selected Areas in Communications: Optical Communications and Networking Series
 23. C. Abou-Fayçal, M. Médard , U. Madhow, "Binary Adaptive Coded Pilot Symbol Assisted Modulation over Rayleigh Fading Channels without Feedback," accepted to IEEE Transactions on Communications
3. Proceedings of Refereed Conferences:
1. T.P. McGarty, M. Médard, "Wireless Architectural Alternatives: Current Economic Valuations Versus Broadband Options, The Gilder Conjecture," Telecommunications Policy Research Conference, October 1994, pp. 174-200, Section 1
 2. M. Médard, R.G. Gallager, "The Issue of Spreading in Multipath Time-Varying Channels," IEEE Vehicular Technology Conference (VTC), July 1995, pp. 1 – 5, Vol.1
 3. M. Médard, R.G. Gallager, "The Effect of a Randomly Time-varying Channel on Mutual Information," IEEE International Symposium on Information Theory (ISIT), September 1995, pg. 139
 4. M. Médard, R.G. Gallager, "The Effect of Channel Variations upon Capacity," IEEE Vehicular Technology Conference (VTC), April 1996, pp. 1781 – 1785, Vol.3
 5. M. Médard, "Security Issues for All-Optical Networks," invited panelist statement, at the National Information Systems Security Conference, October 1996, pg. 882, Vol. 2
 6. M. Médard, S.G.Finn, R.A. Barry, "Automatic Protection Switching for Multicasting in Optical Mesh Networks," Optical Fiber Communication Conference (OFC), February 1997, pp. 314-315
 7. S.G. Finn, M. Médard, R.A. Barry, "A Novel Approach to Automatic Protection Switching IEEE International Conference on Communications (ICC), June 1997, pp. 272 – 276, Vol.1

** Outgrowth of supervised student research

Publications of Muriel Médard

8. R.G. Gallager, M. Médard, "Bandwidth Scaling for Fading Channels," IEEE International Symposium on Information Theory (ISIT), July 1997. pg. 471
9. M. Médard, A.J. Goldsmith, "Capacity of Time-Varying Channels with Channel Side Information," IEEE International Symposium on Information Theory (ISIT), July 1997, pg. 372
10. A.H. Chan, M. Médard, "Reconfigurable Feedback Shift Registers," IEEE International Symposium on Information Theory (ISIT), July 1997, pg. 178
11. M. Médard, "Capacity of Correlated Jamming Channels," Allerton Conference on Communication, Control, and Computing, November 1997, pp. 1043-1052
12. M. Médard, "Bound on Mutual Information for DS-CDMA spreading over Independent Channels," invited paper, Asilomar Conference on Signals, Systems and Computers, October 1997, pp. 187 – 191, Vol.1
13. D. Marquis, M. Médard, R.A. Barry, S.G. Finn, "Physical Security Considerations in All-Optical Networks," invited paper, Proceedings of the International Society for Optical Engineering (SPIE), vol. 3228, November 1997, pp. 260-271
14. M. Médard, A.H. Chan, J.D. Moores, K.A. Hall, K.R. Rauschenbach, S. Parikh, "Ultrafast Cryptography Using Optical Logic in Reconfigurable Feedback Shift Registers," Proceedings of the International Society for Optical Engineering (SPIE), vol. 3228, November 1997, pp. 342-345
15. S.G. Finn, M. Médard, R.A. Barry, "A New Algorithm for Bi-directional Self Healing for Arbitrary Redundant Networks," Optical Fiber Communication Conference (OFC), February 1998. pp. 298-299
16. M. Médard, S.R. Chinn, P. Saengudomlert, "Attack Detection in All-optical Networks," Optical Fiber Communication Conference (OFC), February 1998, pp. 272-273**
17. R. Bergman, M. Médard, S. Chan, "Distributed Algorithms for Attack Localization in All-Optical Networks," Internet Society Network and Distributed System Security (NDSS) Symposium, Session 3, paper 1 (15 pages), February 1998
18. M. Médard, D. Marquis, S.R. Chinn, "Attack Detection Methods for All-Optical Networks," Internet Society Network and Distributed System Security (NDSS) Symposium, Session 3, paper 2 (17 pages), February 1998

Publications of Muriel Médard

19. R.A. Barry, M. Médard, "BER Analysis of Low-rate Communications Through a Single Electro-Optic R2 Nonlinear Regenerator," IEEE Conference on Lasers and Electro-Optics (CLEO), May 1998, pp. 455-456
20. R.G. Gallager, M. Médard, R.A. Barry, S.G. Finn, "Multicast Automatic Protection Switching in Arbitrary Redundant Graphs," IEEE International Conference on Communications (ICC), June 1998, pp. 640 – 644, Vol.1
21. J. Yueh, A.H. Chan, M. Médard, "On the Complexity of Reconfigurable Feedback Shift Register Sequences," IEEE International Symposium on Information Theory (ISIT), August 1998. pg. 133
22. M. Médard, "A Coding Theorem for Multiple-Access Decorrelating Channels," IEEE International Symposium on Information Theory (ISIT), August 1998, pg. 215
23. M. Médard, "Secure Optical Communications," invited paper, FE3, Lasers and Electro-Optics Society (LEOS) Annual Meeting, December 1998, pp. 323 – 324, Vol.2
24. M. Médard, S.G. Finn, R.A. Barry, "WDM Loop-back in Mesh Networks," Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), March 1999, pp. 752 – 759. Vol.2
25. M. Médard, A.J. Goldsmith, "Capacity of Time-Varying Channels with Side Information at the Sender and the Receiver," Miniconference on Information Theory, IEEE International Conference on Communications (ICC), June 1999. pp. 16-20
26. M. Médard, "Processing of Wireless Signals to Preserve Wireline Network Resources," invited paper, IEEE Wireless Communications and Networking Conference (WCNC), September 1999, pp. 61 – 65, Vol.1
27. M. Médard, A. Goldsmith, "Capacity of Time-Slotted ALOHA Systems," invited paper, IEEE Wireless Communications and Networking Conference (WCNC), September 1999, pp. 490 – 494, Vol.1
28. M. Médard, J. Huang, S.P. Meyn, A. Goldsmith, "Capacity of Time-Slotted ALOHA Systems," IEEE International Symposium on Information Theory (ISIT), June 2000, pg. 407**
29. M. Médard, R. Srikant, "Capacity of Nearly-decomposable Markovian Fading Channels under Asymmetric Receiver-Sender Side Information," IEEE International Symposium on Information Theory (ISIT), June 2000, pg. 413

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30. S. S. Lumetta, M. Médard, "Robust routing for Local Area Optical Access Networks," IEEE Lasers and Electro-Optics Society (LEOS) Summer Topical Meeting, July 2000, pp. IV39 - IV40
31. M. Médard, S. Lumetta, Y. Tseng, "Capacity-Efficient Restoration for Optical Networks," Optical Fiber Communication Conference (OFC), paper ThO2, March 2000, pp. 207 - 209**
32. M. Médard, D.N.C. Tse, "Spreading in Block-Fading Channels," Asilomar Conference on Signals, Systems, and Computers, November 2000, pp.1598 – 1602, vol.2
33. P. Saengudomlert, M. Médard, "Limits of BER Guarantees in Transparent Optical Networks Using OOK Signalling," invited paper, 38th Annual Allerton Conference on Communication, Control, and Computing, October 2000, pp. 583 – 592, Vol. 1**
34. M. Médard, I. Abou-Fayçal, U. Madhow, "Adaptive Coding with Pilot Signals," invited paper, 38th Annual Allerton Conference on Communication, Control, and Computing, October 2000. pp. 337 – 346, Vol. 1**
35. M. Médard, R. Srikant, "The Effect on Capacity of Decoupling Slow Fades from Fast Fades in Channels with Asymmetric Channel Information," IEEE International Symposium on Information Theory and its Applications (ISITA), November 2000, pp. 697-700
36. S.S. Lumetta, M. Médard, "Classification of Two-link Failures in All-optical Networks," Optical Fiber Communication Conference (OFC), March 2001, pp. TuO3-1 - TuO3-3, Vol.2
37. Narula-Tam, S.G. Finn, M. Médard, "Analysis of Reconfiguration of IP over WDM Access Networks," Optical Fiber Communication Conference (OFC), sponsored by the Optical Society of America, March 2001, pp. MN4-1 - MN4-3, Vol.1
38. S. Lumetta, M. Médard, "Towards a Deeper Understanding of Link Restoration Algorithms for Mesh Networks," Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), April 2001, pp. 367 – 375, Vol.1
39. R. Koetter, M. Médard, "An algebraic approach to network coding and robust networks," IEEE International Symposium on Information Theory (ISIT), June 2001, pg. 104
40. A.L. Libarikian, M. Médard, "A Robust Optical Folded Bus Architecture for Overlay Access Networks," , invited paper, 39th Annual Allerton Conference on Communication, Control, and Computing, October 2001, pp. 633-645**

Publications of Muriel Médard

41. T.P. Coleman, M. Médard, “Trade-off Between Power Consumption and Delay in Wireless Packetized Systems,” invited paper, 39th Annual Allerton Conference on Communication, Control, and Computing, October 2001, pp. 501-512**
42. R. Koetter, M. Médard. “Beyond Routing: An Algebraic Approach to Network Coding” , Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), July 2002, pp. 122 – 130, Vol.1 (selected as one of the outstanding papers from INFOCOM for transfer to IEEE/ACM Transactions on Networking)
43. H. Wang, E. Modiano, M. Médard, “ Using Local Information for WDM Network Protection,” invited paper, Symposium on Photonics, Networks and Computing, (JCIS), March 2002, pp. 1398-1401 **
44. H. Wang, E. Modiano, M. Médard, “Partial Path Protection for WDM networks,” Sixth Institute for Operations Research and the Management Sciences (INFORMS) Telecommunications Conference , March 2002, paper ME01.2**
45. D.S. Lun, M. Médard, I. Abou-Faycal, “Error Exponents for Wideband Multipath Fading Channels – a Strong Coding Theorem,” Conference on Information Sciences and Systems (CISS), Princeton, April 2002, pp. 866 - 870 **
46. T. Ho, M. Médard, R. Koetter, “A Coding View of Network Recovery and Management for Single Receiver Communications,” Conference on Information Sciences and Systems (CISS), Princeton, April 2002, pp. 590- 597 **
47. M. Médard. “Optical Network Survivability Beyond the Core,” invited paper, Proceedings of the International Society for Optical Engineering (SPIE), vol. 4872, July 2002, pp. 239-253
48. H. Wang, E. Modiano, M. Médard, “Partial Path Protection for WDM Networks: End-to-End Recovery Using Local Failure Information,” IEEE Symposium on Computers and Communications (ISCC), July 2002, pp. 719 - 725**
49. T. Ho, M. Médard, R. Koetter , “A Coding View of Network Capacity, Recovery and Management,” International Symposium on Information Theory, July 2002, pg. 137**
50. D.S. Lun, M. Médard, I. Abou-Faycal, “An Upper Bound on the Error probability of Capacity-Achieving Signaling On Broadband Rayleigh Fading Channels,” IEEE Vehicular Technology Conference, September 2002, pp. 577 – 581, Vol.1 **

Publications of Muriel Médard

51. C. Luo, M. Médard, "FSK for Ultrawideband- How Close to Capacity Can We Get?," International Symposium on Information Theory and its Applications, October 2002, pp. 839-842**
52. D.S. Lun, M. Médard, I. Abou-Faycal, "Error Exponents for Capacity-Achieving Signaling on Wideband Rayleigh Fading Channels," International Symposium on Information Theory and its Applications, October 2002, pp. 255-258**
53. C. Luo, M. Médard, "Frequency Shift Keying for Ultrawideband- Achieving rates of the Order of Capacity," invited paper, 40th Annual Allerton Conference on Communication, Control, and Computing, October 2002, pp. 785 – 796, Vol. 2**
54. Abou-Fayçal, M. Médard, U. Madhow, "Adaptive Coding for PSAM Without Feedback," invited paper, Asilomar Conference on Signals, Systems, and Computers, November 2002, pp. 1503 – 1507, Vol.2
55. C. Luo, M. Médard, "Performance of Single-tone and Two-tone Frequency-shift keying for Ultrawideband," Signals, Systems and Computers, 2002. Conference Record of the Thirty-Sixth Asilomar Conference on ,Volume: 1 , 3-6 November 2002, pp:701 - 705 vol.1 **
56. M. Effros, M. Médard, T. Ho, S. Ray, D. Karger, R. Koetter, "Linear Network Codes: A Unified Framework for Source Channel, and Network Coding," invited paper to the DIMACS Workshop on Network Information Theory, 2003, DIMACS Series in Discrete Mathematics and Theoretical Computer Science, volume 66, American Mathematical Society, pp. 197 - 216 **
57. T. Ho, M. Médard, R. Koetter, "An Information-Theoretic View of Network Management," Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), July 2003, pp. 1456 – 1466, Vol.2 **
58. T. Ho, R. Koetter, M. Médard, D. R. Karger, M. Effros, "The Benefits of Coding over Routing in a Randomized Setting", IEEE International Symposium on Information Theory (ISIT), June 2003, pg. 442**
59. T. Ho, D. R. Karger, M. Médard, R. Koetter, "Network Coding from a Network Flow Perspective ", IEEE International Symposium on Information Theory (ISIT), June 2003, pg. 441**
60. T. Coleman, M. Médard, "The Impact of User Information on Power-Delay Tradeoffs Between in Bursty Packetized Systems," IEEE International Symposium on Information Theory (ISIT), June 2003, pg. 440**
61. N. Peranginangin, M. Médard, R. Gallager, "Capacity of a Multi Output Channel with Distributed Processing," IEEE International Symposium on Information Theory (ISIT), Yokohoma, Japan, June 2003, pg. 97**

Publications of Muriel Médard

62. A.F. Dana, R. Gowaikar, B. Hassibi, M. Effros, M. Médard, “Should we Break a Wireless Network into Subnetworks?,” 41st Allerton Annual Conference on Communication, Control and Computing, October 2003, pp. 50 – 59, Vol. 1
63. S. Ray, M. Médard, J. Abounadi, “Noise-Free Multiple Access Networks Over Finite Fields,” 41st Allerton Annual Conference on Communication, Control and Computing, October 2003, pp. 510 – 511, Vol. 1**
64. L. Zheng, M. Médard, D.N.C. Tse, C. Luo, “On the Interplay Between SNR and Coherence in Wideband Channels,” invited paper, 41st Allerton Annual Conference on Communication, Control and Computing, October 2003, pp. 420, 429, Vol. 1**
65. T. Ho, M. Médard, J. Shi, M. Effros, D. Karger, “On Randomized Network Coding” ,” invited paper, 41st Allerton Annual Conference on Communication, Control and Computing, October 2003, pp. 21 – 29, Vol. 1**
66. M. Médard, M. Effros, T. Ho, D. Karger, “On Coding for Non-Multicast Networks,” invited paper, 41st Allerton Annual Conference on Communication, Control and Computing, October 2003, pp. 11 – 20, Vol. 1**
67. G. Weichenberg, V. Chan, M. Médard, “Reliable Architectures for Networks Under Stress,” Fourth International Workshop on the Design of Reliable Communication Networks (DRCN), October 2003**, pp. 263 – 271, (WINNER OF THE BEST PAPER AWARD)
68. S. Ray, M. Médard, J. Abounadi, “Random Coding in Noise-Free Multiple Access Networks over Finite Fields,” IEEE Global Telecommunications Conference (Globecom) Communication Theory Workshop, December 2003, 1898 – 1902, Vol.4 **
69. C. Zheng, M. Médard, “How Far Should We Spread Using DS-CDMA in Time and Frequency Selective Fading Channels?,” IEEE Global Telecommunications Conference (Globecom) Communication Theory Workshop, December 2003, pp. 1563 - 1567 , Vol. 3**
70. C. Luo, M. Médard, L. Zheng, “Error Exponents for Multi-tone Frequency Shift Keying on Wideband Rayleigh Fading Channels,” IEEE Global Telecommunications Conference (Globecom) Wireless Communications Workshop, December 2003, pp. 779 - 783 Vol. 2 **
71. M. Kim, M. Médard, “Robustness in Large-Scale Random Networks,” Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM) 2004, March 2004, pp. 2364 - 2373**

Publications of Muriel Médard

72. G. Weichenberg, V. Chan, M. Médard, "High-Reliability Architectures for Networks Under Stress," Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM) 2004, March 2004, pp. 131-141**
73. G. Weichenberg, M. Médard, V. Chan, "Designing for Resilience to Multiple Failures," invited paper, Optical Fiber Communication Conference (OFC), sponsored by the Optical Society of America, March 2004, pp. 224 – 227, Vol. 2**
74. T. P. Coleman, A. H. Lee, M. Médard, M. Effros, "On Some New Approaches to Practical Slepian-Wolf Compression Inspired by Channel Coding," 2004 IEEE Data Compression (DCC) Conference, Snowbird Utah, March 2004, pp. 282-291**
75. R. Koetter, M. Effros, T. Ho, M. Médard, "Network Codes as Codes on Graphs," invited paper, 38th Annual Conference on Information Sciences and Systems, Princeton, March 2004, paper 632 (6 pages, proceedings to appear)**
76. T. Ho, M. Médard, M. Effros, R. Koetter, "Network Coding for Correlated Sources," invited paper, 38th Annual Conference on Information Sciences and Systems, Princeton, March 2004, paper 601 (6 pages, proceedings to appear) **
77. L. Zheng, D.N.C. Tse, M. Médard , "Channel Coherence in the Low SNR Regime," invited paper, 38th Annual Conference on Information Sciences and Systems, Princeton, March 2004, paper 604 632 (6 pages, proceedings to appear)**
78. T. Ho, B. Leong, M. Médard, R. Koetter, Y. Chang, M. Effros, "On the utility of network coding in dynamic environments," International Workshop on Wireless Ad-hoc Networks (IWWAN), June 2004 (5 pages, proceedings to appear)** (WINNER OF THE BEST STUDENT PAPER AWARD)
79. A. Bdeir, I. Abou-Fayçal, M. Médard, " Power Allocation Schemes for Pilot Symbol Assisted Modulation over Rayleigh Fading Channels with no Feedback," Communication Theory Symposium of the IEEE International Conference on Communications (ICC 2004), June 2004, pp. 731-742, Vol. 2 **
80. I. Abou-Fayçal, M. Médard, "Optimal Uncoded Regeneration for Binary Antipodal Signaling," Communication Theory Symposium of the IEEE International Conference on Communications (ICC 2004), June 2004, Pages:224 – 227, Vol. 2
81. T. Ho, B. Leong, R. Koetter, M. Médard, M. Effros, "Byzantine Modification Detection in Multicast Networks using Randomized Network Coding," IEEE International Symposium on Information Theory, June 2004, pg. 144 **

Publications of Muriel Médard

82. T.P. Coleman, A.H. Lee, M. Médard, M. Effros, “A New Source-Splitting Approach to the Slepian-Wolf Problem,” IEEE International Symposium on Information Theory, June 2004, pg. 332 **
83. L. Zheng, D.N.C. Tse, M. Médard, “Channel Coherence in the Low SNR Regime,” IEEE International Symposium on Information Theory, June 2004. pg. 416
84. J. Huang, S. Meyn, M. Médard, “Error Exponents for Channel Coding and Signal Constellation Design,” IEEE International Symposium on Information Theory, June 2004, pg. 478
85. D.S. Lun, M. Médard, “On the Sufficiency of Power Control for a Class of Channels with Feedback,” IEEE International Symposium on Information Theory, June 2004, pg. 73 **
86. D.S. Lun, M. Médard, “On Coding for Reliable Communication over Packet Networks,” invited paper, 42nd Allerton Annual Conference on Communication, Control and Computing, October 2004, paper 42-277 (10 pages, proceedings pending)**
87. S. Jaggi, M. Effros, T. Ho, “On Linear Network Coding”, invited paper, 42nd Allerton Annual Conference on Communication, Control and Computing, October 2004, paper 42-263 (10 pages, proceedings pending)
88. P.G. Youssef-Massaad, M. Médard, L. Zheng, “On the Capacity of Multiple-access Channels with Processing Power,” invited paper, 42nd Allerton Annual Conference on Communication, Control and Computing, October 2004, paper 42-279 (10 pages, proceedings pending)**
89. S. Deb, M. Médard, “Algebraic Gossip: A Network Coding Approach to Optimal Multiple Rumor Mongering,” 42nd Allerton Annual Conference on Communication, Control and Computing, October 2004, paper 42-121 (10 pages, proceedings pending)
90. S. Ray, M. Médard, L. Zheng, J. Abounadi, “On the Sublinear Behavior of MIMO Channel Capacity at low SNR,” International Symposium on Information Theory and its Applications (ISITA 2004), October 2004, pp. 1031-1034**
91. P.G. Massaad, M. Médard, L. Zheng, “Impact of Processing Energy on the Capacity of Wireless Channels,” International Symposium on Information Theory and its Applications (ISITA 2004), October 2004, pp. 1580-1585 **
92. D.S. Lun, M. Médard, T. Ho, R. Koetter, “Network Coding with a Cost Criterion,” International Symposium on Information Theory and its Applications (ISITA 2004), October 2004, pp. 1232-1237 **

** Outgrowth of supervised student research

Publications of Muriel Médard

93. M. Effros, R. Koetter, A. Goldsmith, M. Médard, “On Source and Channel Codes for Multiple Inputs and Outputs: Does Multiple Description Meet Space Time?” invited paper, Information Theory Workshop, (6 pages, proceedings pending s) October 2004
 94. L. Zheng, D. Tse, M. Médard, “On the Costs of Channel State Information,” invited paper, Information Theory Workshop, (6 pages, proceedings pending) October 2004
 95. S. Ray, M. Médard, L. Zheng, “On MIMO in the Wideband Limit,” invited paper, Asilomar Conference on Signals, Systems, and Computers, (5 pages, proceedings pending) November 2004**
 96. J.K. Sundararajan, F. Zhao, P.G. Massaad, M. Médard, “A Modification to RED AQM for CIOQ Switches,” IEEE Global Telecommunications Conference (Globecom), (5 pages, proceedings pending) December 2004 **
 97. T.P. Coleman, M. Médard, M. Effros, “Towards Bridging the Gap Between Theory and Practice for the Slepian-Wolf Problem,” invited paper, IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), (4 pages, proceedings pending) March 2005 **
 98. D.S. Lun, N. Ratnakar, R. Koetter, M. Médard, E. Ahmed, H. Lee “Achieving Minimum-Cost Multicast: A Decentralized Approach Based on Network Coding,” accepted to Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM), (10 pages, proceedings pending) March 2005 **
 99. T.P. Coleman, M. Médard, M. Effros, “Towards Practical Minimum-Entropy Universal Decoding,” accepted to 2005 IEEE Data Compression Conference (DCC), Snowbird Utah, (10 pages, proceedings pending), March 2005**
4. Other publications: Book Chapter: M. Médard, S.S. Lumetta, “Network Reliability and Fault Tolerance,” Wiley Encyclopedia of Engineering, Editor: J.G. Proakis
 5. Internal Memoranda:
 1. H. Wang, E. Modiano, M. Médard, “ Partial Path Protection for WDM Networks – End-to-end Recovery using Local Failure Information,” Technical Report LIDS-2517, Sept. 2001
 2. D. S. Lun, M. Médard, T. Ho, R. Koetter, “Network Coding with a Cost Criterion,” Technical Report LIDS-P-2584, April 2004

** Outgrowth of supervised student research

Publications of Muriel Médard

3. J. K. Sundararajan, F. Zhao, P.G. Youssef-Massaad, M. Médard, "A Modification to RED AQM for CIOQ Switches," Technical Report LIDS-2585, April 2004
 4. J. K. Sundararajan, S. Deb, M. Médard, "To Copy or not to Copy: Extending the Birkhoff-von Neumann Switching Strategy to Multicast S," Technical Report LIDS-2624, August. 2004
 5. D. S. Lun, N. Ratnakar, R. Koetter, M. Médard, E. Ahmed, H. Lee, "Achieving Minimum Cost Multicast: A Decentralized Approach Based on Network Coding". Technical Report LIDS-P-2629, September 2004.
6. Invited Lectures:
- Spring 1997 "Optical Network Security," Steering Committee Lecture, MIT Lincoln Laboratory
- Fall 1997 "Spreading and Recovery: topics in communications," **invited** seminar, University of California, Berkeley
- Fall 1997 "Topics in Communications," **invited** seminar, University of Illinois Urbana-Champaign
- Spring 1998 "Topics in Optical Network Security," **invited** seminar, University of Maryland and MIT
- Spring 1998 "Security in Optical Networks," **invited** seminar, Rensselaer Polytechnic Institute
- Fall 1998 "Restoration in Optical Networks," Coordinated Science Laboratory (CSL) Seminar, University of Illinois, Urbana-Champaign
- Fall 1998 "Spreading in Time-varying Channels," **invited** seminar, University of Michigan
- Spring 1999 "Capacity of Time-varying Channels with Side Information," **invited** seminar, University of Michigan and MIT
- Summer 1999 "Capacity of Time-varying Channels with Side Information," **invited** seminar, Northwestern University
- Fall 1999 "An Overview of Security for Optical Networks," Coordinated Science Laboratory (CSL) Seminar, University of Illinois Urbana-Champaign

** Outgrowth of supervised student research

Publications of Muriel Médard

Fall 1999 “Capacity of Fast Time-varying Channels with Side Information,” Coordinated Science Laboratory (CSL) Seminar, University of Illinois Urbana-Champaign

Fall 2000 “Restoration in Optical Networks,” **invited** seminar, Carnegie-Mellon University

Spring 2001 M. Médard, “Robustness and Recovery in Optical Networks,” **invited** presentation, *IEEE Gigabit Networking Workshop*, also **invited** seminar, George Washington University

May 2001 “Some different aspects of adaptive coding for wireless communications,” **invited** seminar, Stanford University and **invited** seminar, Lucent Bell Labs (June 2001)

June 2001, “Robust Optical Communications,” **invited** seminar, Lucent Bell Labs

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

October 2001 “Some New Directions in Communications and Networking,” **invited** tutorial, Federal Communications Commission

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

December 2001, “Optical Network Security,” **invited** talk to the DARPA Information Assurance for Optical Networks (OpticIA) Workshop

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”

April 2002, “Some Aspects of Robustness in Wireless Networks,” **invited** seminar, University of Massachusetts, Amherst

June 2002, “Overview of New Results in Optical Access Networks Robustness,” **invited** Photonics Series seminar at the University of Illinois Urbana-Champaign

October 2002, M. Médard , M. Kim, “A Bound on Backup Path Lengths Using a Random Graph Approach,” **invited** paper, IEEE Annual Computer Communications Workshop, 2002

Publications of Muriel Médard

October 2002, “Network Coding and Network Management – Towards Fundamental Limits?,” **invited** seminar, Cornell University, also **invited** seminar, Boston University

November 2002, “Security in Optical Networks,” **invited** briefing to the Assistant Secretary of Defense (C3I) (Highland Forum), at the Pentagon (Washington, D.C.)

Spring 2003, “Network Coding: Towards an Unified View of Routing, Network Management, Coding and Compression?,” **invited** seminar, Applied Mathematics Department, Brown University, also **invited** seminar, ECE Department, Georgia Tech, also **invited** IBM Lecture, Notre Dame University

Fall 2004, “Network Coding: Towards an Unified View of Routing, Recovery, Coding and Compression?,” **invited** seminar, Harvard University

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

May 2004, D.S. Lun, M. Médard, T. Ho, R. Koetter, “Network Coding with a Cost Criterion,” **invited** talk, Communication Theory Workshop

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)

August 2004, “Towards a Random, Distributed Operation of Networks,” **invited** presentation, Lucent Bell Labs, also Colloquium, Northeastern University, October 2004

October 2004, “Byzantine Modification Detection in Multicast Networks Using Randomized Network Coding,” **invited** seminar, Northeastern University

October 2004, “On the Implications of Optical Splitting for Multicasting,” **invited** presentation, 19th IEEE Annual Computer Communications Workshop

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)

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

Publications of Muriel Médard

April 2005, “How Good is Random Linear Coding Based Distributed Networked Storage?” **invited** presentation, First Workshop on Network Coding, Theory, and Applications

June 2005, **Plenary Speaker**, IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC), New York

Theses Supervised by Muriel Médard

Summary

	Total	Completed	In Progress
Bachelor			
Master of Engineering	5	3	2
Master of Science Engineer	12	10	2
Doctoral			
As Supervisor	9	2	7
As Reader	15	12	3

Bachelor's Theses and other student projects

Chan, Serena, "Localization of Attacks in Optical Networks," Summer 97 and January, 6-A student at MIT Lincoln Laboratory (Serena is now in the doctoral program at MIT)

Lin, Alvin, "Computer Simulation of Algorithms for Creating Minimal weight Redundant Trees in Edge-Redundant Graphs," Summer 00, 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

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," Summer 2001, project through the Research Science Institute

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

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

Ryu, Ho Seung (Paul), "Distribution of Node Degrees in Large Networks," Summer 2003 project through the Research Science Institute (**Project was Semi-Finalist at the Siemens-Westinghouse Competition**)

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

Theses Supervised by Muriel Médard

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

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

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

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

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, started Summer 2004, proposal submitted

Lee, Anna, started Summer 2004, proposal submitted

Theses Supervised by Muriel Médard

Master's 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 award (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 award**

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

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

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

Youssef-Massaad, Pamela, proposal submitted, started Fall 03 (co-supervised with Lizhong Zheng)

Sundararajan, Jay Kumar, started Fall 03 (co-supervised with Supratim Deb)

Theses Supervised by Muriel Médard

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**)

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

Luo, Cheng, started Fall 01, proposal submitted, “Communications over Wideband Fading Channels,” (co-supervised with Lizhong Zheng)

Coleman, Todd, started Fall 02

Lun, Desmond, started Fall 02

Ray, Siddharth, started Fall 03 (co-supervised with Lizhong Zheng)

Weichenberg, Guy, started Summer 03 (co-supervised with Vincent Chan)

Kim, Minkyu, started Summer 03

Zhao, Fang, started Fall 03

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)

Theses Supervised by Muriel Médard

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

Gentry, Sommer, (supervised by Eric Feron), expected May 2005

Rasala-Lehman, April (supervised by Madhu Sudan), expected January 2005

Wen, Yonggang, (supervised by Vincent W.S. Chan), expected May 2006

Postdoctoral Associates and Fellows Supervised by Muriel Médard

Current Postdocs

Name: Supratim Deb

Dates of Appointment: September 2003 – January 2004

Ph.D. Granting Institution: University of Illinois Urbana-Champaign

Current Position: Postdoctoral Fellow (will join Lucent Bell Labs in India at Member of Technical Staff at the end of January 2004)

Previous Postdocs

Name: Ibrahim C. Abou-Fayçal

Title: Post-Doctoral Lecturer

Current Employer: American University of Beirut

Current Position: Assistant Professor