

CURRICULUM VITAE

Roxana Smarandache

Associate Professor

Department of Mathematics, San Diego State University, San Diego, CA 92182

June 4, 2009

Education

1996: B.S. Mathematics, University of Bucharest, Romania.

1997: M.S. Mathematics, University of Notre Dame, Indiana, US.

2001: Ph.D. Mathematics, University of Notre Dame, Indiana, US.

Appointments

2007-now Associate Professor, San Diego State University, Dept. of Mathematics.

2008-2009 Guest Professor in the "Institut für Mathematik" University of Zürich, and in the "Forschungsinstitut für Mathematik" ETH, Zürich, Switzerland (on sabbatical paid leave from SDSU).

2005-2006 Visiting Assistant Professor, University of Notre Dame, Dept. of Mathematics, (on un-paid leave from SDSU).

2001-2007 Assistant Professor, San Diego State University, Dept. of Mathematics.

1999-2000 Research Assistant, Swiss Federal Institute of Technology, Lausanne, Switzerland (EPFL), Department of Communication Systems, (on leave from U. of Notre Dame).

1997-2001 Teaching and Research Assistant, University of Notre Dame, Dept. of Mathematics.

Awards

2008-2011 NSF Grant TF-0830608, \$130,000, Principal Investigator.

2007-2010 NSF Grant DMS-0708033, \$120,000, Principal Investigator.

06,07/2006

08/2005 Sponsored by NSF Grant CCR-0205310, \$15,000.

1997-2005 IEEE Travel awards from IEEE International Symposium on Information Theory(\$1,000).

1998-1999 Fellowship of the Center for Applied Mathematics, University of Notre Dame.

1997 Richard Sady Prize Award for the best first year graduate student in Mathematics, University of Notre Dame.

Articles in Refereed Journals and Chapters of Books:

- [1] R. Smarandache and M. F. Flanagan, Spectral Graph Analysis of Quasi-Cyclic Codes, in preparation.

- [2] R. Smarandache and P. O. Vontobel, Absdet-Pseudo-Codewords and Perm-Pseudo-Codewords, in preparation.
- [3] Virtudes Tomás, J. Rosenthal and R. Smarandache, Decoding of MDP Convolutional Codes over the Erasure Channel, in preparation.
- [4] Virtudes Tomás, R. Smarandache and J. Rosenthal, A Family of Superregular Matrices, in preparation.
- [5] A. E. Pusane, R. Smarandache, P. O. Vontobel, and D. J. Costello, Jr., Deriving Good LDPC Convolutional Codes from QC LDPC Block Codes, in preparation.
- [6] R. Smarandache, P. O. Vontobel, Quasi-Cyclic LDPC Codes: Influence of Proto- and Tanner-Graph Structure on Minimum Hamming Distance Upper Bounds. Submitted to IEEE Trans. Inform. Theory, January 2009.
- [7] R. Smarandache, A. Pusane, P. O. Vontobel, D. J. Costello, Jr., Pseudo-Codeword Performance Analysis for LDPC Convolutional Codes, IEEE Trans. Inform. Theory, Volume 55, Issue 6 (2009), 2577–2598.
- [8] R. Hutchinson, R. Smarandache, J. Trunpf, Superregular Matrices and the Construction of Convolutional Codes having a Maximum Distance Profile, Linear Algebra and Its Applications 428 (2008), 2585-2596.
- [9] R. Smarandache and P. O. Vontobel, Pseudo-codeword analysis of Tanner graphs from projective and Euclidean planes, IEEE Trans. Inform. Theory, Volume 53, Issue 7 (2007), 2376–2393.
- [10] R. Smarandache and M. Wauer, Bounds on the pseudo-weight of minimal pseudo-codewords of projective geometry codes, Contemporary Mathematics, Algebra and Its Applications, vol. 419 (2006), 285–296.
- [11] H. Glüsing-Lüerßen, J. Rosenthal, and R. Smarandache, Strongly MDS convolutional codes, in IEEE Trans. Inform. Theory, Volume 52, Issue 2 (2006), 584–598.
- [12] R. Hutchinson, J. Rosenthal, and R. Smarandache, Convolutional codes with maximum distance profile, in Systems & Control Letters, Volume 54, Issue 1 (2005), 53-63.
- [13] R. Smarandache, H. Glüsing-Lüerßen, and J. Rosenthal, Constructions for MDS-convolutional codes, in IEEE Trans. Inform. Theory, Volume 47, Issue 5 (2001), 2045–2049.
- [14] R. Smarandache, Unit memory convolutional codes with maximum distance, in Codes, Systems and Graphical Models, IMA Volume 123 (2000), 381–396, Springer-Verlag.
- [15] J. Rosenthal and R. Smarandache, Maximum distance separable convolutional codes, Appl. Algebra Engrg. Comm. Comput., vol. 10 (1999), 15–32.

Refereed Articles Published in Conference Proceeding:

- [16] R. Smarandache and M. F. Flanagan, Spectral Graph Analysis of Quasi-Cyclic Codes, submitted to Globecom 2009.
- [17] R. Smarandache and P. O. Vontobel, Absdet-Pseudo-Codewords and Perm-Pseudo-Codewords: Definitions and Properties, Proc. IEEE Intern. Symp. on Inform. Theory, July, 2009.
- [18] Virtudes Tomás, J. Rosenthal and R. Smarandache, Decoding of MDP Convolutional Codes over the Erasure Channel, Proc. IEEE Intern. Symp. on Inform. Theory, July, 2009.
- [19] A. E. Pusane, R. Smarandache, P. O. Vontobel, and D. J. Costello, Jr., On deriving good LDPC convolutional codes from QC LDPC block codes, Proc. IEEE Intern. Symp. on Inform. Theory, 2007.

- [20] R. Smarandache, A. Pusane, D. J. Costello, Jr. and P. O. Vontobel, Pseudo-codewords in LDPC convolutional codes, Proc. IEEE Intern. Symp. on Inform. Theory, 2006.
- [21] P. O. Vontobel and R. Smarandache, On minimal pseudo-codewords of Tanner graphs from projective planes, Proc. 43rd Allerton Conf. on Communications, Control, and Computing, 2005.
- [22] P. Vontobel, R. Smarandache, N. Kiyavash, J. Teutsch, D. Vukobratović, On the Minimal Pseudo-Codewords of Codes from Finite Geometries, Proc. IEEE Intern. Symp. on Inform. Theory, 2005, 980–984.
- [23] R. Smarandache and P. O. Vontobel, On regular quasi-cyclic LDPC codes from binomials, Proc. IEEE Intern. Symp. on Inform. Theory, 2004, p. 274.
- [24] M. Greferath, M. O’Sullivan, R. Smarandache, Construction of good LDPC codes using dilation matrices, Proc. IEEE Intern. Symp. on Inform. Theory, 2004, p. 237.
- [25] H. Glüsing-Lüerßen, R. Hutchinson, J. Rosenthal, R. Smarandache, Convolutional Codes which are Maximum Distance Separable and which have a Maximum Distance Profile, Proc. of the 41-th Annual Allerton Conference on Communication, Control, and Computing, 2003.
- [26] M. O’Sullivan, R. Smarandache, High-rate, short length, $(3, 3s)$ -regular LDPC Codes of girth 6 and 8, Proc. IEEE Intern. Symp. on Inform. Theory, 2003, p. 59.
- [27] M. O’Sullivan, M. Greferath, R. Smarandache, Construction of LDPC Codes from Affine Permutation Matrices, Proc. of the 40-th Annual Allerton Conference on Communication, Control, and Computing, 2002.
- [28] M. O’Sullivan, M. Greferath, R. Smarandache, Analysis of Iterative Decoding Algorithms, Proc. of 15th International Symposium on the Mathematical Theory of Networks and Systems, 2002.
- [29] R. Smarandache, H. Glüsing-Lüerßen, J. Rosenthal, Strongly MDS Convolutional Codes with Maximal Decoding Capability, Proc. IEEE Intern. Symp. on Inform. Theory, 2002.
- [30] R. Smarandache, H. Glüsing-Lüerßen, J. Rosenthal, Construction and Decoding of Strongly MDS Convolutional Codes, Proc. of 15th International Symposium on the Mathematical Theory of Networks and Systems, 2002.
- [31] R. Smarandache, J. Rosenthal, Construction Results for MDS-Convolutional Codes, Proc. IEEE Intern. Symp. on Inform. Theory, 2000, p. 294.
- [32] J. Rosenthal, R. Smarandache, On the dual of MDS convolutional codes, Proc. of the 36-th Annual Allerton Conference on Communication, Control, and Computing, 1998, 576–583.
- [33] R. Smarandache, J. Rosenthal, Convolutional code constructions resulting in maximal or near maximal free distance, Proc. IEEE Intern. Symp. on Inform. Theory, 1998, p. 308.
- [34] R. Smarandache, H. Glüsing-Lüerßen, J. Rosenthal, Generalized first order descriptions and canonical forms for convolutional codes, Proc. of Mathematical Theory of Networks and Systems, 1998, 1091–1094.
- [35] R. Smarandache, J. Rosenthal, A state space approach for constructing MDS rate $1/n$ convolutional codes, Proc. of the 1998 IEEE Information Theory Workshop on Information Theory, 1998, 116–117.
- [36] J. Rosenthal, R. Smarandache, Construction of convolutional codes using methods from linear system theory, Proc. of the 35-th Annual Allerton Conference on Communication, Control, and Computing, 1997, 953–960.

Invited talks and visits:

1. Absdet and Perm Codewords and Pseudo-Codewords, ENSEA, Universite de Cergy-Pontoise - CNRS, ETIS group, Paris, France, March 3, 2009.
2. Quasi-Cyclic LDPC Codes: Influence of Proto- and Tanner-Graph Structure on Minimum Hamming Distance Upper Bounds, EPFL, Lausanne, Switzerland, December 4, 2008.
3. Pseudo-codewords for LDPC Convolutional Codes, EE Department, Ulm, Germany, October 27, 2008.
4. Quasi-Cyclic LDPC Codes: Influence of Proto- and Tanner-Graph Structure on Minimum Hamming Distance Upper Bounds, University of Zurich, Switzerland, October 23, 2008.
5. Families of Unwrapped LDPC Convolutional Codes, poster, IEEE Communication Theory Workshop, Virgin Islands, May 12, 2008.
6. Coding Theory workshop, Oberwolfach, Germany, Dec. 02 -08, 2007.
7. Deriving Good LDPC Convolutional Codes from LDPC Block Codes, University of California at San Diego, Information Theory and Applications (ITA) Seminar, June 12, 2007.
8. IMA Annual Program Year Workshop on Complexity, Coding, and Communications, Minneapolis, MN, April 15-22, 2007.
9. Algebraic Analysis of the Performance of Low-Density Parity-Check Convolutional Codes , University of Arizona, Mathematics Department, Applied Mathematics Colloquim, Tucson, Arizona, October 6, 2006.
10. Expander graphs tutorial lectures in number theory, Univ. of Notre Dame, Mathematics, Spring 2006.
11. Minimal Pseudo-codewords of Codes from Finite Geometries , AMS National Meeting, Lincoln, Nebraska, October 21-23, 2005.
12. University of Zurich, Department of Mathematics, Switzerland, July 4-12, 2005.
13. On Minimal Vectors of Codes from Finite Geometries, Conference on Algebra and its Applications, Ohio University Center of Ring Theory and its Applications, Department of Mathematics, Athens, Ohio, March 22-26, 2005.
14. On the Minimal Pseudo-Codewords of Codes from Finite Geometries at the University of Arizona, ECE Department, in the Communication Theory Seminar, Tucson, Arizona, February 18, 2005.
15. Convolutional Codes and The Viterbi Algorithm Tutorials, 2004 IMA Summer Program for Graduate Students in Coding and Cryptography, June 8- 27, 2004, University of Notre Dame.
16. Quasi-cyclic LDPC Codes, AMS National Meeting, Athens, Ohio, March 25-27, 2004.
17. Strongly-MDS and MDP Convolutional Codes, University of Salamanca, Spain, March 13-20, 2004.
18. Convolutional Codes which are Maximum Distance Separable and which have a Maximum Distance Profile, 41-th Annual Allerton Conference on Communication, Control, and Computing, Allerton, October, 2003.
19. Construction and Decoding of Strongly MDS Convolutional Codes, International Symposium on the Mathematical Theory of Networks and Systems, University of Notre Dame, August 2002.
20. Convolutional Codes with Maximum Distance Profile, AMS National Meeting, Boulder, Colorado, October 3-5, 2003.

21. Visit, University of Notre Dame, Department of Mathematics, August 4-11, 2003.
22. Algebraic Convolutional Codes tutorial lecture, at the University of California at San Diego, Department of Mathematics, San Diego, CA, April 16, 2003.
23. Algebraic Constructions of Convolutional Codes, University of California at San Diego, Center for Magnetic Recording Research, San Diego, CA, November 12, 2002.
24. Construction and Decoding of Strongly MDS Convolutional Codes, University of Notre Dame, Notre Dame, IN, the 15th International Symposium on the Mathematical Theory of Networks and Systems, August 2002.
25. Bell Laboratories, Mathematical Sciences Research Center, Mathematics of Communications Department, Murray Hill, NJ, January 30, 2001.
26. Convolutional Codes with Large Free Distance, University of Groningen, Department of Mathematics and Computing Science, Groningen, Netherlands, June 13, 2000.
27. Constructions of MDS Convolutional Codes, EPFL, Communication Systems Department, Lausanne, Switzerland, December 6, 2000.
28. Algebraic Constructions of Convolutional Codes, University of Kaiserslautern, Department of Mathematics, Kaiserslautern, Germany, October 18, 1999.
29. Algebraic Constructions of Convolutional Codes, University Oldenburg, Department of Mathematics, Oldenburg, Germany, October 13, 1999.
30. Constructions of MDS convolutional codes, University of Illinois, Coordinated Science Laboratory, Urbana-Champaign, April 19, 1999.
31. 1/n-MDS Convolutional Codes at the Department of Mathematics, University College Cork, Cork, Ireland, June 18, 1998.

Professional societies:

Member of AMS, IEEE.

Synergistic Activities

- Organizing committee of
 - AMS Sectional Meeting, Bloomington, Indiana, April 4-6, 2008.
 - AMS National Meeting, New Orleans, January 5-7, 2007.
 - AMS National Meeting, San Diego, California, January 5-7, 2002.
- TPC of IMA Summer School in Coding and Cryptography, Univ. of Notre Dame, Indiana, 2004.
- TPC of 5th International Symposium on Turbo Codes & Related Topics, EPFL, Lausanne, 2008.
- Reviewer for several journals, transactions, and conferences in both mathematics and engineering: Linear Algebra and its Applications Journal, IEEE Transactions on Information Theory, EURASIP Journal on Wireless Communications and Networking, Electronics and Telecommunications Research Institute (ETRI) Journal (Daejeon, South Korea), Proc. of IEEE Inter. Symp. on Inform. Theory, Proc. of IEEE International Communications Conference, Proc. of IEEE Globecom - Communications Theory.

Collaborators and Their Affiliations

Collaborators: D. J. Costello Jr. (EE, Notre Dame, IN), T. Fuja (EE, Notre Dame, IN) M. Flanagan (EE, U. College Dublin, Ireland), M. Greferath (Math., U. College Dublin, Ireland),

R. Hutchinson (Math., Bemidji State U., MN), H. Gluesing-Luerssen (Math., U. of Kentucky , Lexington, KY), Abigail Mitchell (Math., University of Zurich, Switzerland); A. E. Pusane (EE, Notre Dame, IN), M. O'Sullivan (Math., SDSU, San Diego, CA), J. Rosenthal (Math., University of Zurich, Switzerland), J. Trumpf (Systems Engineering, RSISE, The Australian National University, Canberra ACT 0200, Australia), Virtudes Tomás, (Math., U. of Alicante, Spain), P. O. Vontobel (Hewlett-Packard Laboratories, Palo Alto, CA), M. Wauer (U. of Ulm, Germany).