Curriculum Vitae for Jon-Lark Kim

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A. Areas of Main Interest:

Algebra, Discrete Math, and Number Theory with Applications to Coding Theory

B. Education:

2002	PhD	mathematics	University of Illinois–Chicago
		thesis title	Construction of new self-dual codes and quantum codes and their connections
		thesis advisor	Professor Vera Pless
1997	MS	mathematics	Seoul National University, S. Korea
1993	BS	mathematics	Pohang University of Science and Technology, S. Korea

C. Professional Experiences:

8/2005 – present	Assistant Professor	University of Louisville, KY
8/2002 - 8/2005	Research Assistant Professor post doctoral advisor	University of Nebraska–Lincoln Professor Judy Walker
1/2002 – 5/2002	Instructor	University of Illinois–Chicago
8/1998 – 12/2001	Teaching Assistant/University Fellow	University of Illinois–Chicago
3/1998 – 6/1998	Part time instructor	Dongyang Technical College, Korea
9/1996 – 12/1996	Teaching Assistant	Seoul National University
9/1994 – 3/1996	Soldier	Military service in Navy, Korea
3/1993 – 6/1994	Teaching Assistant	Seoul National University

D. Research Trips:

5/2005 – 7/2005	Visiting Researcher local host	Korea Institute for Advanced Study Dr. Eunjeong Lee
7/2004 – 8/2004	Visiting Assistant Professor local host	Pohang Univ. of Sci. & Tech., Korea Professor Hyun Kwang Kim
6/9/2003 – 7/9/2003	Visiting Researcher local host	Ghent University, Belgium Professor Leo Storme
6/2000 – 8/2000	Visiting Research Fellow local host	Pohang Univ. of Sci. & Tech., Korea Professor Hyun Kwang Kim

E. Research Papers:

a. Refereed Journal Papers:

[20] J.-L. Kim and P. Solé, Skew Hadamard designs and their codes, *Designs, Codes, and Cryptography,* Special issue: Coding and Cryptography. In Memory of Hans Dobbertin, WCC 2007, Vol. 49 (2008), pp. 135–145.

[19] T.A. Gulliver, J.-L. Kim, and Y. Lee, New MDS or near-MDS self-dual codes, *IEEE Transactions on Inform Theory* Vol. 54 (2008), No. 9, pp. 4354–4360.

[18] S. Han and J.-L. Kim, On self-dual codes over $\mathbb{F}_5$, *Designs, Codes, and Cryptography*, Vol. 48 (2008), No. 1, pp. 43–58.

[17] J.-L. Kim and J.L. Walker, Nonbinary Quantum Error-Correcting Codes from Algebraic Curves, *Discrete Math* as a special issue of Com2MaC conference, July 2004, Pusan, Korea, Vol. 308 (2008), No. 14. pp. 3115–3124.

[16] S. Han and J.-L. Kim, Upper bounds for the lengths of s-extremal codes over $\mathbb{F}_2$, $\mathbb{F}_4$, and $\mathbb{F}_2 + u\mathbb{F}_2$, IEEE Trans. Inform.Theory, Vol. 54 (2008), No. 1, pp. 418–422.

[15] J.-L. Kim and Y. Lee, Construction of MDS self-dual codes over Galois rings, *Designs, Codes, and Cryptography,* Vol. 45 (2007), pp. 247-258.

[14] J.-L. Kim and V. Pless, A note on formally self-dual even codes of length divisible 8 with Vera Pless, *Finite Fields and Their Applications,* Vol. 13, No. 2, (2007), pp. 224-229.

[13] J.-L. Kim, K.E. Mellinger, and L. Storme, Small weight codewords in LDPC codes defined by (dual) classical generalized quadrangles, *Designs, Codes and Cryptography,* 42 (2007), 73-92.

[12] S.T. Dougherty, J.-L. Kim, and P. Sole, Double circulant codes from two class association schemes, *Advances in Mathematics of Communication,* 1 (2007), 45-64.

[11] E.P. Bautista, P. Gaborit, J.-L. Kim, and J.L. Walker, s-extremal Additive F_4 codes, *Advances in Mathematics of Communication,* 1 (2007), 111-130.

[10] J.-L. Kim and Y. Lee, Euclidean and Hermitian self-dual MDS codes over large finite fields, *J. Combinatorial Theory, Ser. A,* Vol. 105 (2004) pp. 79-95.

[9] J.-L. Kim, U.N. Peled, I. Perepelitsa, V. Pless and S. Friedland, Explicit construction of families of LDPC codes with no 4-cycles, *IEEE Trans. Inform. Theory,* Vol. 50, No. 10 (2004), pp. 2378- 2388.

[8] T.A. Gulliver and J.-L. Kim, Circulant based extremal additive self-dual codes over GF(4), *IEEE Trans. Inform. Theory,* Vol. 50, No. 2 (2004), pp 359-366 .

[7] J.-L. Kim, K. Mellinger and V. Pless, Projections of binary linear codes onto larger fields, *SIAM journal on Discrete Math,* Vol. 16, No. 4 (2003), pp. 591-603.

[6] J.-L. Kim and V. Pless, Designs in additive codes over GF(4), *Designs, Codes and Cryptography,* Vol. 30 (2003), pp. 187-199.

[5] P. Gaborit, J.-L. Kim, and V. Pless, Decoding binary $R(2,5)$ by hand, a special issue on Com^{2}Mac Conference on Association Schemes, Codes and Designs, Pohang, Korea, 7/3 - 7/7, 2000, *Discrete Math.* Vol. 264 (2003), pp. 55-73.

[4] T. A. Gulliver, M. Harada, and J.-L. Kim, Construction of some extremal self-dual codes, *Discrete Math,* Vol. 263 (2003), pp. 81-91.

[3] J.-L. Kim, New self-dual codes over GF(4) with the highest known minimum weights, *IEEE Trans. Inform. Theory,* Vol. 47 (2001), pp. 1575-1580.

[2] J.-L. Kim, New extremal self-dual codes of lengths 36,38, and 58, *IEEE Trans. Inform. Theory,* Vol. 47 (2001), pp. 386-393.

[1] J.-L. Kim, Relation between weight distribution and combinatorial identities, *Bulletin of the Institute of Combinatorics and its Application,* Canada, Vol. 31 (2001), pp. 69-79.

b. Accepted Papers:

[4] J.-L. Kim, A prize problem in coding theory, To appear in the book for proceedings *D1: Groebner, Coding, and Cryptography* (submitted, April 10, 2007, accepted 6/2008)

[3] S.T. Dougherty, J.-L. Kim, and H. Kulosman, MDS codes over finite principal ideal rings, To appear in *Designs, Codes, and Cryptography* (submitted, Mar. 5, 2007, accepted 4/22/2008)

[2] J.-L. Kim, and S. Seif, and H. Kulosman, A quick way to Galois and strongly pure rings, To appear in *Pan-American Mathematical Journal* (submitted, Dec. 31, 2007, accepted 4/12/2008)

[1] H. K. Kim, D. K. Kim, and J.-K. Kim, Type I codes over GF(4), To appear in *Ars Combinatoria,* (accepted on May 17, 2007)

c. Book Chapter (refereed):

[1] J.-L. Kim, Remarks on s-extremal codes, Advances in Coding Theory and Cryptology, Series on Coding Theory and Cryptology, 2. World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2007, pp. 101-113.

d. Conference Proceedings (refereed):

[3] J.-L. Kim, New quantum error correcting codes from Hermitian self-orthogonal codes over GF(4), *Proc. of the 6th International conference on Finite fields and applications,* at Oaxaca, Mexico, May 21 - 25, 2001, Springer Verlag (2002), pp. 209-213.

[2] J.-L. Kim and V. Pless, Decoding some doubly-even self-dual $[32, 16, 8]$ codes by hand, *Codes and Designs : Proc. of a conference honoring Professor Dijen K. Ray-Chaudhuri, (Columbus, OH, 2000),* Ohio State University Math. Resear. Inst. Publ., 10, *de Gruyter*, Berlin, (2002), pp. 165-178.

[1] P. Gaborit, W. C. Huffman, J.-L. Kim and V. Pless, On additive GF(4) codes, *DIMACS Workshop on Codes and Association Schemes,* DIMACS Series in Discrete Math. and Theoret. Computer Science, Amer. Math. Soc., Vol. 56 (2001), pp. 135-149.

e. Conference Proceedings (non-refereed):

[10] E. P. Bautista, P. Gaborit, J.-L. Kim, and J. L. Walker, s-Extremal additive codes over $GF(4)$, *IEEE International Symposium on Information Theory*, Seattle, July 2006, 1296-1300. Abstract.

[9] J.-L. Kim, U.N. Peled, I. Perepelitsa, V. Pless and S. Friendland, Explicit construction of families of LDPC codes with no 4-cycles, *Proc. of 2004 IEEE International Symposium on Information Theory,* Chicago, USA, June 27-July 2 (2004), pp. 235. Abstract.

[8] J.-L. Kim and Y. Lee, MDS self-dual codes, *Proc. of 2004 IEEE International Symposium on Information Theory,* Chicago, USA, June 27-July 2 (2004), pp. 526. Abstract.

[7] T.A. Gulliver and J.-L. Kim, Classification of circulant and 4-circulant extremal additive self-dual codes, *Proc. of 2002 9IEEE International Symposium on Information Theory,* Lausanne, Switzerland, June 30-July 5 (2002), pp. 457. Abstract.

[6] J.-L. Kim, Dual cyclic codes with two zeros, *Proceedings of the 40th Allerton Conference on Communication, Control and Computing,* Univ. of Illi. at Urbana-Champaign, IL, (2002), pp. 1017-1023.

[5] J.-L. Kim, U. L. Peled, I. Perepelitsa, and V. Pless, Explicit construction of families of LDPC codes with girth at least six, *Proceedings of the 40th Allerton Conference on Communication, Control and Computing,* Univ. of Illi. at Urbana-Champaign, IL., (2002), 1024-1031.

[4] P. Gaborit, J.-L. Kim and V. Pless, Decoding binary $R(2, 5)$ by hand and by machine, *Proc. of 2001 IEEE International Symposium on Information Theory,* Washington, D.C., June 24-29 (2001), pp. 86. Abstract.

[3] J.-L. Kim, New good Hermitian self-dual codes over GF(4), *Proc of 2001 IEEE International Symposium on Information Theory,* Washington, D.C., June 24-29 (2001), pp. 177. Abstract.

[2] J.-L. Kim and V. Pless, Designs in additive codes over GF(4), *Proceedings of the 38th Annual Allerton Conference on Communication, Control and Computing,* UIUC, Oct. 4-6, (2000), pp. 1010-1018.

[1] P. Gaborit, W. C. Huffman, J.-L. Kim and V. Pless, On the classification of extremal additive codes over GF(4), *Proceedings of the 37th Allerton Conference on Communication, Control and Computing,* Univ. of Illi. at Urbana-Champaign, IL., Sep. (1999), pp. 535-544.

f. Submitted Articles:

[7] J.-L. Kim and X. Liu, A Generalized Gleason-Pierce-Ward Theorem, submitted, 7/23/2008

[6] J.-L. Kim and Y. Lee, Building-up constructions for self-dual codes, submitted, 6/2/2008

[5] S. Han and J.-L. Kim, The nonexistence of near-extremal formally self-dual codes, resubmitted, May 7, 2008 (5/21/07 original submission)

[4] S. Han and J.-L. Kim, Triple circulant codes based on quadratic residues, submitted, Mar. 14, 2008

[3] J.-L. Kim and G.L. Matthews, Quantum error-correcting codes from algebraic curves, submitted, Mar. 4, 2008, survey paper

[2] S. Han and J.-L. Kim, Formally self-dual additive codes over $\mathbb{F}_4$, submitted, Feb. 18, 2008

[1] S.T. Dougherty, J.-L. Kim, and H. Liu, Constructions of self-dual codes over chain rings, submitted, Nov. 27, 2007

F. Awards/Fellowships/Nominations:

[1] *3/2005* : 2004 Kirkman medal, Institute of Combinatorics and its Applications (ICA), Winnipeg, Canada (the medal recognizes outstanding work by ICA members in their early research careers), Bulletin of ICA, Vol 44, May 2005.

[2] *6/2004* : Travel award, IEEE Inform. Theory Society, Piscataway, NJ.

[3] *2002/2003* : Leitzel Project NExT Fellow awarded by the Mathematical Association of America.

[4] *2002* : Nomination for a Clay 2002 Liftoff Fellow by Department of Mathematics, Stat, & Computer Science, University of Illinois-Chicago (only one nominated).

[5] *2001* : Nomination for Provost award by Department of Mathematics, Stat, & Computer Science, University of Illinois-Chicago (only one nominated).

[6] *2000/2001* : University Fellowship (university-wide competition), Graduate College, University of Illinois-Chicago.

[7] *Spring, 2000* : TA teaching award from Department of Mathematics, Stat, & Computer Science, University of Illinois-Chicago.

[8] *6/2001* : Travel award, IEEE Inform. Theory Society, Piscataway, NJ.

[9] *9/30 - 10/8, 2000* : Travel award from Yamagata University, Japan.

[10] *3/11 - 3/15, 2000* : Travel scholarship, Winter School 2000, University of Arizona, Tucson.

G. List of Recent Presentations: (* marked for invited talks)

2008

[3*] 8/14 - 8/16, 08: US-Korea Conference 2008, San Diego, Applied and Pure Mathematics, "Duadic double circulant codes".

[2*] 7/28 - 8/1, 08: Mathematical Theory of Networks and Systems, Virginia Tech, Blacksburg, VA, "Double circulant codes based on a duadic spliting".

[1*] 4/5 - 4/6, 08: AMS sectional meeting (special session on Algebraic Aspects of Coding Theory), Indiana University, Bloomington, IN, "Self-dual codes over finite chain rings".

2007

[5*] 10/5 - 10/6, 07: AMS sectional meeting, DePaul University, Chicago, "Formally self-dual additive codes over $\mathbb{F}_4$".

[4*] /9 - 8/11, 07: US-Korea Conference 2007, Washington DC., Contemporary Basic Science, "Codes over rings".

[3*] 7/19 - 7/22, 07: Advances in Coding Theory and Cryptography, Oakland University, MI, "Remarks on s-extremal codes".

[2*] 3/3 - 3/4, 07: AMS sectional meeting, Davidson, North Carolina, "MDS or near-MDS self-dual codes".

[1*] *1/5 - 1/8, 07* : Joint Mathematics meeting, New Orleans, LA, "Skew Hadamard Designs and Their Codes".

2006

[5*] *10/21, 06* : AMS sectional meeting, Cincinnati, OH "Optimal subcodes of self-dual codes".

[4] *7/1-7/2, 06*: A *Mini Workshop on Coding Theory* at Pohang Univ. of Sci. and Tech., "Quadratic double circulant codes and their generalization".

[3] *7/9-7/14, 06*: IEEE International Symp. Information Theory, Seattle, "s-extremal additive codes over $GF(4)$.

[2] *6/26- 6/30, 06*: Algebraic Combinatorics, An International Conference in Honour of Eiichi Bannais 60th Birthday, "Small weight codewords in LDPC codes defined by (dual) classical generalized quadrangles"

[1*] *2/6, 06* : The math department talk at Clemson University, Clemson, SC, "Capacity-approaching low-density parity-check codes".

H. Member of Editorial Board: International Journal of Information and Coding Theory, Inderscience Publishers. 2007-2009, forthcoming journal.

I. Referee/Reviewer:

[1] Referee for journals: **(a)** IEEE Transactions on Information Theory, **(b)** SIAM journal on Discrete Math, **(c)** Ars Combinatoria, **(d)** Discrete Math, **(e)** Designs, Codes, and Cryptography, **(f)** Journal of Combinatorial Theory, Ser. A, **(g)** J. of Pure and Applied Math, **(h)** Finite Fields and Their Applications, **(i)** Discrete Applied Math, **(j)** Advances in Mathematics of Communication, **(k)** Graphs and Combinatorics, **(l)** Math Magazine, **(m)** Michigan Mathematical Journal.

[2] Referee for conferences : (a) 2001 Proceedings of the Louisiana / Mississippi section of the Math. Assoc. of Amer., (b) 2004 IEEE International Symposium on Information Theory at Chicago, (c) the Workshop on "Coding and Cryptography" organized by MIRIAM, (d) ICC 2005 - IEEE International Conference on Communication - in Seoul, (e) 16th AAECC Symposium on Applied Algebra, Algebraic Algorithms, and Error-Correcting Codes.

[3] Reviewer for AMS Mathematical Reviews (18 times) and the Encyclopedia of Information Systems (Academic Press).

J. Academic Membership: American Mathematical Society, Institute of Electrical and Electronics Engineers (Member), and Institute of Combinatorics and its Applications (Associate Fellow).

K. Other Academic Activities: (a) Participate for the Algebra-Combinatorics-Number Theory seminar (since Fall, 2005) at U. of Louisville (b) Serve as a senior mentor at 2004 IMA PI Summer Program for Graduate Students on Coding and Cryptography (June 8-26, 2004). (c) Organize coding theory seminar at U. of Nebraska (9/2003 - 5/2005) and an informal cryptography seminar with four graduate students (Fall, 2003).