

Curriculum Vitae: Olav Geil

Last update: July 22, 2022

Personal information

Date of birth April 7, 1962
Position Vice Dean for Education
Affiliation The Faculty of Engineering and Science
Aalborg University
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Academic degrees

PhD in Mathematics, Aalborg University, May 17th, 2000.
MSc in Mathematics and Physics, Aalborg University, June 26th, 1996.

Employment

2018– Vice Dean for Education, The Faculty of Engineering and Science, Aalborg University
2014– Professor with Special Responsibilities, Dept. of Math. Sci., Aalborg University
2002–2014 Associate Professor, Dept. of Math. Sci., Aalborg University
1999–2002 Assistant Professor, Dept. of Math. Sci., Aalborg University

Board memberships

- Bestyrelsen for Engineer the Future, 2019–
- Bestyrelsen for Frederikshavn Gymnasium, 2018-2019
- Bestyrelsen for Mariagerfjord Gymnasium, 2022–

Research stays

University of Zürich, Switzerland, 2018 (2 days). / Jaume I University, Castellon, Spain, 2016 (two weeks). / East China Normal University, Shanghai, China, 2013 (ten days). / Basel University, Basel, Switzerland, 2012 (one week). / East China Normal University, Shanghai, China, 2012 (ten days). / Tokyo Institute of Technology, 2006 (two weeks). / Technical University of Denmark, Lyngby, Denmark, 2000 (2 weeks). / Eindhoven University of Technology, Eindhoven, The Netherlands, 1998 (3 months). /

Grants

Grant holder and principal investigator for research project under DFF-FNU, “How secret is a secret?”, DFF-4002-00367, 2014–2017, (2.509.920 DKK.)

The Villum Foundation for Ryutaroh Matsumoto as Velux Visiting Professor, 2014, (201.300 DKK).

The Villum Foundation for Ryutaroh Matsumoto as Velux Visiting Professor, 2011, (285.000 DKK).

Management

Vice Dean for Education at the Faculty of Engineering and Science, AAU, 2018–

Principal investigator for research project “How secret is a secret?”, 7 scientists, 2014–2017.

Chairman for the 1st year mathematics studies development project first.math, 2012–2016, (annual budget 7.500.000 DKK).

Participation in “Research Management Course”, Copenhagen Business School, 2016.

Participation in “Research Management Masterclass 2020” CBS Executive, 2020.

Participation in “Agil projektledelse”, IDA Learning, 2021.

Publications

Scopus: 49 papers <https://www.scopus.com/authid/detail.uri?authorId=6602737792>

Citations

Google Scholar: 897 citations h-index 15 <https://scholar.google.dk/citations?user...>

Scopus: 457 citations h-index 11 <https://www.scopus.com/authid/detail.uri?authorId=>

Referee/Reviewer

Finite Fields and Their Applications; Designs, Codes and Cryptography; IEEE Transactions on Information Theory; Discrete Mathematics; Advances in Mathematics of Communications; Communications of the Korean Mathematical Society; Journal of Pure and Applied Algebra; Cryptography and Communications; Applicable Algebra in Engineering, Communication and Computing; Journal of Symbolic Computation; Mathematical Review/MathSciNet; various workshops and conferences

Talks

Invited: 33 Contributed: 14 (full list at the end of the document)

Organization of conferences/workshops

Dune workshop on secrets, Klitgaarden Skagen, October 2–4, 2017.

“Secrets”, Technical University of Denmark, November 14, 2016.

“Workshop on Applications of Algebraic Geometry in Secret Sharing and Coding Theory”, Aalborg University, June 30, 2014.

In collaboration with D. Ruano “4th AGINCC Workshop”, Skagen, Denmark, July 28–31, 2013.

In collaboration with T. Høholdt, Session “Coding Theory” at “European Mathematical Society Joint Mathematical Weekend”, University of Copenhagen, March 2, 2008.

“Mini Workshop on Error Correcting Codes and Network Coding”, Aalborg University, September 19, 2007.

In collaboration with L. D. Andersen, “8th Nordic Combinatorial Conference”, Aalborg University, October 20–22, 2004.

Program Committee Member

Codes, Cryptology and Curves 2019 / 5th International Caste Meeting on Coding Theory and Applications (ICMCTA) 2017 / International Symposium on Network Coding (Net-Cod) 2014 / Workshop on Coding and Cryptography (WCC) 2013 / Workshop on the Arithmetic of Finite Fields (WAIFI) 2012 / International Workshop on the Arithmetic of Finite Fields (WAIFI) 2010

Long-term guests

F. Hernando, Jaume I University, Spain, 2017 (1 month). / F. Özbudak, Middle East Technical University, Turkey, 2016 (1 month). / R. Pellikaan, Eindhoven University of Technology, The Netherlands, 2016 (2 weeks). / F. Hernando, Jaume I University, Spain, 2015 (1 month). / R. Pellikaan, Eindhoven University of Technology, The Netherlands, 2015 (2 weeks). / R. Matsumoto, Tokyo Institute of Technology, Japan, 2014 (3 months). / F. Hernando, Jaume I University, Spain, 2013 (1 month). / Y. Luo, Shanghai Jiao Tong University, China, 2013 (1 month). / R. Matsumoto, Tokyo Institute of Technology, Japan, 2011 (4.5 months). / C. Galindo, Jaume I University, Spain, 2010 (1 month). / R. Matsumoto, Tokyo Institute of Technology, Japan, 2006 (2 weeks) / M. Sala, University of Trento, Italy, 2006 (1 month). /

PhD students

René Bødker Christensen (2018–2021)

Umberto Martínez Peñas (2014–2017)

Stefano Martin (2011–2014)

Casper Thomsen (2007–2011)

Henning E. Andersen (informal co-supervisor 2002–2005)

Master students

Kasper Halbak Christensen (2017) / Louise Foshammer (2014) / Malte Neve-Græsbøl (2014) / Henning Thomsen (2012) / Maria Simonsen (2012) / Majken Svendsen (2012) / Claus Jensby Madsen (2010) / Thomas H. Skjærbæk (2010) / Nicola Machetti (2010) / Elisabeth Kuhr Rasmussen (2005) / Maria Sondrup Iversen (2004) / Jane Gravgård Knudsen (2004) / Henning E. Andersen (2001)

PhD courses given at foreign universities

5 hours course at “International School and Conference on Coding Theory”, CIMAT, Guanajuato, Mexico, November 28 – December 4, 2008.

In cooperation with Massimiliano Sala, “Summer Doctoral School 2009, Gröbner Bases, Geometric Codes and Order Domains”, University of Trento, June 8–13, 2009.

6 hours course at “Soria Summer School on Computational Mathematics”, University of Valladolid, July 12–16, 2010.

6 hours course at “Algebraic Coding Theory Summers School 2022,” University of Zurich, July 4–8, 2022.

Participation in PhD committees

University of Trento (1 student). / Technical University of Denmark (chairman of 4 committees). / Nanyang Technological University (1 student). / Aalborg University (1 student) / Aalborg University (Chairman of 1 committee).

Teaching

PhD supervision course, AAU Learning Lab, 2015. / Teaching training course “Adjunkt-pædagogikum”, ædagogisk Udviklingscenter, AAU, 2001–2002. / Since 1999 teaching at all levels from bachelor to PhD.

Patents

1. D. Ruano, D. E. Lucani, O. Geil, “Accelerated processing for maximum distance separable codes using composite field extensions,” US Patent 10,819,374, 2020

Publication list

Journal publications and articles in books and proceedings

1. O. Geil, “From primary to dual affine variety codes over the Klein quartic,” in *Des. Codes Cryptogr.*, vol. 90, no. 3, 2022, pp. 523–543.
2. O. Geil, “On multivariate polynomials with many roots over a finite grid,” *J. Algebra Appl.*, vol. 20, no. 8, 2021, 9 pp.
3. L. B. Bertel, I. Askehave, H. Brohus, O. Geil, A. Kolmos, N. Ovesen, J. Stoustrup, “Digital Transformation at Aalborg University: Interdisciplinary Problem and Project Based Learning in a Post-Digital Age,” *Advances in Engineering Education*, 2021, 13 pp.
4. R. B. Christensen, O. Geil, “On nested code pairs from the Hermitian curve,” *Finite Fields Appl.*, vol. 68, 2020, 26 pp.
5. R. B. Christensen, O. Geil, “Steane-enlargement of quantum codes from the Hermitian function field,” *Des. Codes Cryptogr.*, vol. 88, no. 8, 2020, pp. 1639–1652.
6. P. Beelen, O. Geil, E. Martinez-Moro, X.-W. Wu, “Foreword - special issue: Codes, cryptology and curves in honour of Ruud Pellikaan,” *Des. Codes Cryptogr.*, vol. 88, no. 8, 2020, pp. 1477–1478.

7. R. B. Christensen, O. Geil, “On Steane-enlargement of quantum codes from Cartesian product point sets,” *Quantum Inf. Process.*, vol. 19, no. 7, Paper No. 192, 2020, 15 pp.
8. O. Geil, F. Özbudak, D. Ruano, “Constructing Sequences with High Nonlinear Complexity from Hermitian Function Fields,” *Semigroup Forum*, vol. 98, no. 3, 2019, pp. 543–555.
9. D. Ruano, D. E. Lucani, O. Geil, “Accelerated processing for maximum distance separable codes using composite extension,” *Proceedings of European Wireless 2019, 25th European Wireless Conference.*, pp. 1–5.
10. O. Geil, U. Martínez-Peñas, “Bounding the number of common zeros of multivariate polynomials and their consecutive derivatives,” *Combinatorics, Probability and Computing*, vol. 28, no. 2, 2019, pp. 253–279.
11. O. Geil, F. Özbudak, “On affine variety codes from the Klein quartic,” *Cryptography and Communications*, vol. 11, no. 2, 2019, pp. 237–257.
12. D. E. Lucani, M. V. Pedersen, D. Ruano, C. W. Sørensen, F. H. P. Fitzek, J. Heide, O. Geil, V. U. Nguyen, M. Reisslein, “Fulcrum: Flexible network codes for heterogeneous devices,” *IEEE Access*, vol. 6, 2018, 18 pages.
13. C. Galindo, O. Geil, F. Hernando, D. Ruano, “New binary and ternary LDC codes,” *IEEE, Trans. Inform. Theory*, vol. 65, no. 2, 2018, pp. 1008–1016.
14. C. Galindo, O. Geil, F. Hernando, D. Ruano, “Improved constructions of nested code pairs,” *IEEE, Trans. Inform. Theory*, vol. 64, 2018, pp. 2444–2459.
15. O. Geil, S. Martin, U. Martínez-Peñas, R. Matsumoto, D. Ruano, “On asymptotically good ramp secret sharing schemes,” *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, vol. E100-A, no. 12, 2017, pp. 2699–2708.
16. O. Geil, S. Martin, “Relative generalized Hamming weights of q -ary Reed-Muller codes,” *Adv. Math. Commun.*, vol. 11, No. 3, 2017, pp. 503–531.
17. O. Geil, F. Özbudak, “Bounding the minimum distance of affine variety codes using symbolic computations of footprints,” Proceedings of 5th International Castle Meeting, ICMCTA 2017, *Lecture Notes in Comput. Sci.*, vol. 10495, 2017, pp. 128–138.
18. O. Geil, D. Lucani, “Random network coding over composite fields,” Proceedings of 5th International Castle Meeting, ICMCTA 2017, *Lecture Notes in Comput. Sci.*, vol. 10495, 2017, pp. 118–127.
19. C. Galindo, O. Geil, F. Hernando, D. Ruano, “On the distance of stabilizer quantum codes from \mathcal{J} -affine variety codes,” *Quantum Inf. Process.*, vol. 16, 2017, 32 pp.
20. O. Geil, C. Thomsen, “More results on the number of zeros of multiplicity at least r ,” *Discrete Math.*, vol. 340, 2017, pp. 1028–1038.
21. O. Geil, S. Martin, U. Martínez-Peñas, D. Ruano, “Refined analysis of RGHWS of code pairs coming from Garcia-Strichtenoth’s second tower,” *J. Algebra Comb. Discrete Struct. Appl.*, vol. 4, 2017, pp. 37–47.

22. R. Matsumoto, Ruano, D. O. Geil, "List decoding algorithm based on voting in Gröbner bases for general one-point AG codes," *J. Symbolic Comput.*, vol. 79, part 2, 2017, pp. 384–410.
23. O. Geil, S. Martin, U. Martínez-Peñas, R. Matsumoto, D. Ruano, "On asymptotically good ramp secret sharing schemes," Proceedings (electronic) of WCC-2015, edited by P. Charpin, 10 pp.
24. O. Geil, "Roots and coefficients of multivariate polynomials over finite fields," *Finite Fields Appl.*, vol. 34, 2015, pp. 36–44.
25. O. Geil, S. Martin, "An improvement of the Feng-Rao bound for primary codes," *Des. Codes Cryptogr.*, vol. 76 (1), 2015, pp. 49–79.
26. O. Geil, S. Martin, R. Matsumoto, D. Ruano, Y. Luo, "Relative generalized Hamming weights of one-point algebraic geometric codes," *IEEE, Trans. Inform. Theory*, vol. 60, 2014, pp. 5938–5949.
27. O. Geil, S. Martin, "Further improvements on the Feng-Rao bound for dual codes," *Finite Fields Appl.*, vol. 30, 2014, pp. 33–48.
28. O. Geil, R. Matsumoto, D. Ruano, "Feng-Rao decoding of primary codes," *Finite Fields Appl.*, vol. 23, 2013, pp. 35–52.
29. R. Matsumoto, D. Ruano, O. Geil, "Generalization of the Lee-O'Sullivan List Decoding for One-Point AG Codes," *J. Symbolic Comput.*, vol. 55, 2013, pp. 1–9.
30. O. Geil, C. Thomsen, "Aspects of random network coding," Book chapter in *Algebraic Geometry Modeling in Information Theory*, World Scientific (Series on Coding Theory and Cryptography, vol. 8), Edited by Edgar Martinez-Moro, 2013, pp. 47–81.
31. O. Geil, C. Thomsen, "Weighted Reed-Muller codes revisited," *Des. Codes Cryptogr.*, vol. 66, (1-3), 2013, pp. 195–220.
32. O. Geil, R. Matsumoto, D. Ruano, "List Decoding Algorithms based on Groebner Bases for General One-Point AG Codes," Proceedings of 2012 IEEE International Symposium on Information Theory (*ISIT*), July 1-6, 2012, Boston, MA, USA, pp. 86–90.
33. O. Geil, S. Martin, R. Matsumoto, "A new method for constructing small-bias spaces from Hermitian codes," Proceedings of WAIFI 2012, *Lecture Notes in Comput. Sci.*, vol. 7369, 2012, pp. 29–44.
34. O. Geil, C. Munuera, D. Ruano, F. Torres, "On the order bounds for one-point AG codes," *Adv. Math. Commun.*, 2011, pp. 489–504.
35. O. Geil, C. Thomsen, "List decoding of a class of affine variety codes," Proceedings of WCC-2011, Paris, Ed. by D. Augot and A. Canteaut, pp. 263–272.
36. O. Geil, "Algebraic geometry codes from order domains," Book chapter in *Gröbner Bases, Coding, and Cryptography*, Springer, 2009, Eds.: Sala, Mora, Perret, Sakata, Traverso, pp. 121–141.
37. O. Geil, R. Matsumoto, "Bounding the number of rational places using Weierstrass semigroups," *Journal of Pure and Applied Algebra*, vol. 213, (6), 2009, pp. 1152–1156.

38. O. Geil, "Evaluation Codes from an Affine Variety Code Perspective," Book chapter in *Advances in algebraic geometry codes*, Ser. Coding Theory Cryptol., 5, World Sci. Publ., Hackensack, NJ, 2008, Eds.: E. Martinez-Moro, C. Munuera, D. Ruano, pp. 153–180.
39. O. Geil, R. Matsumoto, C. Thomsen, "On Field Size and Success Probability in Network Coding," Proceedings of WAIFI 2008, *Lecture Notes in Comput. Sci.*, vol. 5130, 2008, pp. 157–173.
40. O. Geil, "On the second weight of generalized Reed-Muller codes," *Des. Codes Cryptogr.*, vol. 48 (3), 2008, pp. 323–330.
41. H. E. Andersen, O. Geil, "Evaluation Codes from Order Domain Theory," *Finite Fields Appl.*, vol. 14 (1), 2008, pp. 92–123.
42. O. Geil, R. Matsumoto, "Generalized Sudan's list decoding for order domain codes," Proceedings of AAECC-17, *Lecture Notes in Comput. Sci.*, vol. 4851, Springer-Verlag, 2007, pp. 50–59.
43. O. Geil, C. Thommesen, "On the Feng-Rao Bound for Generalized Hamming Weights," Proceedings of AAECC-16, *Lecture Notes in Comput. Sci.*, vol. 3857, Springer-Verlag, 2006, pp. 295–306
44. O. Geil, "On Codes from Norm-Trace Curves," *Finite Fields Appl.*, vol. 9, 2003, pp. 351–371.
45. O. Geil, R. Pellikaan, "On the Structure of Order Domains," *Finite Fields Appl.*, vol. 8, 2002, pp. 369–396.
46. O. Geil, T. Høholdt, "On Hyperbolic Codes," Proceedings of AAECC-14, *Lecture Notes in Comput. Sci.*, vol. 2227, Springer-Verlag, 2001, pp. 159–171.
47. O. Geil, T. Høholdt, "Footprints or Generalized Bezout's Theorem," *IEEE Trans. Inform. Theory*, vol. 46, 2000, pp. 635–641.

PhD-thesis

48. O. Geil, "Codes Based on an \mathbb{F}_q -Algebra," Department of Mathematical Sciences, Aalborg University, 2000. Adviser Christian Thommesen.

Preprints

49. D. E. Lucani, M. V. Pedersen, D. Ruano, C. W. Sørensen, F. H. P. Fitzek, J. Heide, O. Geil, "Fulcrum network codes: a code for fluid allocation of complexity," 2015, 31 pages. Available from <http://arxiv.org/pdf/1404.6620v2.pdf>.

Peer reviewed summaries and extended abstracts

50. O. Geil, S. Martin, "Affine variety codes are better than their reputation," Proceedings of the 21st Symposium on Mathematical Theory of Networks and Systems, University of Groningen, 2014, pp. 362–365.

51. O. Geil, S. Martin, R. Matsumoto, D. Ruano, Y. Luo, "Relative generalized Hamming weights of one-point algebraic geometric codes," Proceedings of IEEE Information Theory Workshop (*ITW*), 2014, pp. 137–141.
52. H. E. Andersen, O. Geil, "The Missing Evaluation Codes from Order Domain Theory," Proceedings of 2004 IEEE International Symposium on Information Theory (*ISIT*), Chicago, p. 78.
53. O. Geil, T. Høholdt, "On Hyperbolic Type Codes," Proceedings of 2003 IEEE International Symposium on Information Theory (*ISIT*), Yokohama, p. 331.
54. O. Geil, "A Class of Groebner Basis Theoretically Based Evaluation Codes," Proceedings of 2002 IEEE International Symposium on Information Theory (*ISIT*), Lausanne, p. 60.
55. O. Geil, "Codes from Order Domains," Proceedings of 2001 IEEE International Symposium on Information Theory (*ISIT*), Washington, p. 308.

Book reviews

56. O. Geil, "Book Review of : Tracey Ho and Desmond S. Lun, Network Coding: An Introduction," *Computer Journal*, vol. 54, 2009, p. 510.
57. O. Geil, C. Thommesen, "Book review of: Jørn Justesen and Tom Høholdt, A Course In Error-Correcting Codes," *Newsletter of The European Mathematical Society*, March 2005, pp. 39–40.
58. O. Geil, C. Thommesen, "Book review of: Jørn Justesen and Tom Høholdt, A Course In Error-Correcting Codes," *Matilde* (newsletter for Dansk Matematisk Forening), vol. 21, 2004, p. 27.

Miscellaneous

59. O. Geil, "Bounding the number of affine roots," in *Mathematisches Forschungsinstitut Oberwolfach*, Report no. 13/2019, pp. 60–63.
60. O. Geil, actor in and screen writer for the film "Olav Geil: Fejlkorrigerende koder." 10 danske matematikere – 10 matematiske fortællinger, L&R Uddannelse, 2016. Available from <https://www.youtube.com/watch?v=rIszlgH7Exw>.
61. O. Geil, S. Martin, U. Martínez-Peñas, D. Ruano, "Refined analysis of RGHWS of code pairs coming from Garcia-Stichtenoth's second tower," Proceedings of *ACA 2015-Applications of Computer Algebra*, Kalamata, Greece 2015, 5 pp. Available from <http://www.singacom.uva.es/~iremarquez/CACTC2015/CACTC-4.pdf>.
62. O. Geil, "Two applications of the footprint (or Δ -set) bound : Estimation of generalized Hamming weights," by Olav Geil, poster at Special Semester on Gröbner Bases and Related Methods 2006, Workshop D1: Gröbner Bases in Cryptography, Coding Theory and Algebraic Combinatorics, Radon Institute for Computational and Applied Mathematics and Research Institute for Symbolic Computation, Linz, Austria, May 2006.

63. H. E. Andersen, O. Geil, “On the minimum distance of one-point geometric Goppa codes,” in Proceedings of AGCT-10 : Arithmitique et Theorie de L’Information, CIRM, Luminy, 2005, Eds. F. Rodier and S. Vladut, 2005, 2 pp.
64. O. Geil, ”On some Gröbner Basis Theoretical Applications,” in Proceedings of the 8th Nordic Combinatorial Conference, edited by Lars Døvling Andersen and Olav Geil, Aalborg University 2004, pp. 59-64.
65. L. D. Andersen, O. Geil, editors of “Proceedings of the 8th Nordic Combinatorial Conference,” Aalborg University 2004.

Talks and workshops

1. Invited lectures at PhD School

Algebraic Coding Theory Summer School 2022 UZH, University of Zurich, Switzerland, July 4–8, 2022

2. Invited talk

NORCOM 2019

Gentofte, August 5–7, 2019

“Bounding the number of affine roots (with applications in communication theory)”

3. Invited talk

SIAM Conference on Applied Algebraic Geometry, AG 19

Bern, July 9–13, 2019

(presenting joint work with R. B. Christensen)

“Improved secret sharing schemes and quantum codes from the Hermitian curve”

4. Invited talk

Contemporary Coding Theory

MFO, Oberwolfach, March 17–23, 2019

“Bounding the number of affine roots (with applications in communication theory and algebraic function field theory)”

5. Invited talk

Codes, Cryptology and Curves – celebrating the influence of R. Pellikaan

Eindhoven University of Technology, March 7–8, 2019

(presenting joint work with K. H. Christensen)

“Exploring the order domain conditions”

6. Contributed talk

Engineer the Future at Folkemødet,

Bornholm Denmark,

June 14-16, 2018

(Presenting the project SECURE with Astrid Oberborbeck Andersen)

“Smarte systemer og personsikkerhed: Drøm eller mareridt?”

7. **Invited talk**
University of Zürich, March 21, 2018,
 (presenting joint work with Carlos Galindo, Fernando Hernando and Diego Ruano,
 and joint work with René B. Christensen)
 “Optimized constructions of nested code pairs”
8. **Contributed talk**
5th International Castle Meeting on Coding Theory and Applications,
 Vihula, Estonia, August 28-31, 2017
 (Presenting joint work with Ferruh Özbudak)
 “Bounding the minimum distance of affine variety codes using symbolic computations
 of footprints.”
9. **Contributed talk**
5th International Castle Meeting on Coding Theory and Applications,
 Vihula, Estonia, August 28-31, 2017
 (Presenting joint work with Daniel E. Lucani)
 “Random network coding over composite fields.”
10. **Invited talk**
SIAM Conference on Applied Algebraic Geometry
 Session MS86: *Coding Theory*.
 Georgia Institute of Technology, USA, July 31 - August 4, 2017
 (Presenting joint work with Carlos Galindo, Fernando Hernando and Diego Ruano)
 “Improved construction of nested code pairs.”
11. **Invited talk**
Meeting of the Catalan, Spanish, Swedish Math Societies
 Session 5: *Numerical Semigroups and Applications*.
 Umeå University, Sweden, June 12-15, 2017
 (Presenting joint work with Kasper Halbach Christensen)
 “A Gröbner basis approach for counting rational places in algebraic function fields.”
12. **Contributed talk**
Secrets
 Technical University of Denmark, Lyngby, Denmark, November 14, 2016
 “Improved constructions of nested code pairs.”
13. **Workshop organization**
 (in collaboration with Peter Beelen)
Secrets
 Technical University of Denmark, Lyngby, Denmark, November 14, 2016.
14. **Inaugural Lecture**
 Department of Mathematical Sciences, Aalborg University, August 30, 2016 “Bound-
 ing the number of affine roots – with applications in reliable and secure communica-
 tion”
15. **Invited talk**
On the Algebraic and Geometric Classifications of Projective Varieties University of
 Messina, Italy, June 20–24, 2016
 “Bounding the number of affine roots using algebraic methods.”

16. **Invited talk**
Seminar at Jaume I University, Spain, June 3, 2016
“Bounding the number of affine roots using algebraic methods.”
17. **Invited research stay**
University Jaume I, Castellon, Spain, May 23 – June 3, 2016
18. **Workshop participation**
Symposium on the 60th birthday of Ivan Damgård Aarhus University, Denmark, April 1-2, 2016
19. **Invited talk**
Information Meeting for The Danish National Research Foundation at Aalborg University
Aalborg University, Denmark, February 3, 2016
With Tom Høholdt
“Presentation of Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography”
20. **Workshop participation**
DARNEC’15 Design and Application of Random Network Codes
Istanbul Technical University, Turkey, November 4–6, 2015
21. **Workshop participation**
The Seventh International Workshop on Coding and Cryptography (WCC-2015)
Paris, France, April 13–17, 2015.
22. **Contributed talk**
Workshop on Applications of Algebraic Geometry in Secret Sharing and Coding Theory
Aalborg University, Denmark, June 30, 2014
(Presenting joint work with Stefano Martin, Ryutaroh Matsumoto, Diego Ruano, and Yuan Luo)
“Ramp secret sharing schemes from one-point AG codes.”
23. **Workshop organization**
Workshop on Applications of Algebraic Geometry in Secret Sharing and Coding Theory
Aalborg University, Denmark, June 30, 2014.
24. **Contributed talk**
IEEE Information Theory Workshop (ITW 2014)
Hobart, Tasmania, Australia, November 2–5, 2014
(presentation of joint work with Stefano Martin, Ryutaroh Matsumoto, Diego Ruano and Yuan Luo)
“Relative generalized Hamming weights of one-point algebraic geometric codes.”
25. **Workshop participation**
4th International Castle Meeting on Coding Theory and Applications
Castle of Palmela, Portugal, September 14–20, 2014
26. **Workshop participation**
NetCod 2014 – International Symposium on Network Coding
Aalborg University, Denmark, June 27–28. 2014

27. **Invited talk**
International Conference on Algebraic Geometry and Coding Theory
 Indian Institute of Technology, Bombay, Mumbai, India
 December 2–6, 2013
 “Affine variety codes are better than their reputation.”
28. **Invited talk**
Special Semester on Applications of Algebra and Number Theory
Algebraic Curves over Finite Fields
 RICAM, Linz, Austria, November 11–15, 2013
 “Affine variety codes are better than their reputation.”
29. **Workshop participation**
COST Conference
 Ghent University, Belgium, September 18–20 2013
30. **Workshop organization**
 (in collaboration with Diego Ruano)
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
 Klitgården, Skagen, Denmark, July 28–31 2013
31. **Invited research stay**
 East China Normal University, Shanghai, China, April ??–?? 2013
32. **Invited talk**
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
 East China Normal University, Shanghai, China, April ??–?? 2013
 “The Feng-Rao bounds for RGHW with applications in Secret Sharing”
33. **Invited talk**
Zürich COST Meeting
 University of Zürich, Switzerland, June 20–21, 2013
 “On Success Probability in Random Network Coding (A review).”
34. **Invited talk**
Mathematics of Information-Theoretic Cryptography
 Lorenz Center, Leiden, The Netherlands, May 21–25 , 2013
 “Further improvements on the Feng-Rao bound for dual codes.”
35. **Invited talk**
KIAS International Conference on Coding Theory and Applications
 KIAS, Seoul, Korea, November 15–17, 2012
 “The Feng-Rao bounds.”
36. **Workshop participation**
Trends in Coding Theory
 Ascona, Switzerland, October 28 – November 2, 2012
37. **Invited talk**
Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography

Technical University of Denmark, August 15–16 2012
(presentaion of joint work with Ryutaroh Matsumoto and Diego Ruano)
“Feng-Rao decoding of primary codes.”

38. Invited talk

Meeting in Danish-Chinese Center for Applications of Algebraic Geometry in Coding Theory and Cryptography
East China Normal University, May 19–26 2012
“One-point AG-codes from an affine-variety point of view.”

39. Invited research stay

East China Normal University, Shanghai, China, May 19–26 , 2012.

40. Invited talk

Basel University, Switzerland, March 19, 2012
“ n applications of the footprint bound ($n \geq 3$).”

41. Invited research stay

Basel University, Switzerland
March 16 – 23, 2012.

42. Invited talk

Combinatorial, Algebraic and Algorithmic Aspects of Coding Theory
Aspects of Coding Theory
EPFL, Lausanne, Switzerland, July 25, 2011
(Presenting joint with Casper Thomsen)
“Weighted Reed-Muller codes revisited.”

43. Workshop participation

The Seventh International Workshop on Coding and Cryptography (WCC-2011)
Paris, France, April 11–15, 2011.

44. Invited lectures

3rd Soria Summer School in Computational Mathematics
Soria, Spain
July 12–16, 2010 Six hours lecture “Network Coding.”

45. Workshop participation

12th IMA International Conference on Cryptography and Coding
Cirencester, England, December 15–17, 2009

46. Invited workshop participation

Workshop on Sequences, Codes and Curves
Antalya, Turkey, September 25–29, 2009

47. Workshop participation

NetCod 2009 – Internation Symposium on Network Coding
EPFL, Lausanne, Switzerland, June 15–16 2009

48. PhD school organization and lectures

(in collaboration with Max Sala)
Summer Doctoral School: *Gröbner Bases, Geometric Codes, and Order Domains*
University of Trento, Italy, June 8–13, 2009

49. **Invited talk**
4th Interdisciplinary Seminar on Applied Mathematics Aalborg University, Denmark,
 April 23, 2009
 “Random Network Coding and Error-Erasure Correction in Networks”
50. **Invited lectures**
International School and Conference on Coding Theory
 Centro de Investigación en Matemáticas (CIMAT), Guanajuato, Mexico, November
 28–December 4, 2008
 Five hours lecture: “Order domain codes and affine variety codes.”
51. **Invited talk**
Applications of Computer Algebra (ACA)
 RISC, Castle of Hagenberg, Austria, July 27–30, 2008
 “On the second weight of generalized Reed-Muller codes.”
52. **Workshop participation**
International Workshop on the Arithmetic of Finite Fields WAIFI 08
 University of Siena, Italy
 July 6–9, 2008.
53. **Session organization**
Session: Coding Theory
European Mathematical Society, Joint Mathematical Weekend
 University of Copenhagen, February 29 – March 2, 2008
54. **Invited talk**
Thematic Seminar on Algebraic Geometry, Coding and Computing
 University of Valladolid, Segovia, Spain, October 8–10, 2007
 “Weierstrass semigroups and the number of rational places.”
55. **Contributed talk**
 Mini-workshop *Error-correcting codes and network coding*
 Aalborg University, Denmark, September 19, 2007
 “Weierstrass semigroups and the number of rational places.”
56. **Workshop organization**
 Mini-workshop *Error-correcting codes and network coding*
 Aalborg University, Denmark, September 19, 2007
57. **Invited talk**
2nd Interdisciplinary Seminar on Applied Mathematics
 Aalborg University, Denmark, October 25, 2006
 “Affine Variety Codes”
58. **Workshop participation**
IMA workshop: Complexity, Coding, and Communications
 University of Minnesota, USA, April 16–20, 2007.
59. **Invited talk**
Seminar
 Tokyo Institute of Technology, Japan, August 8, 2006
 “Generalizations of the Reed-Solomon Codes Via Gröbner Basis Theory.”

60. **Invited research stay**
Tokyo Institute of Technology, Japan, Two weeks, August, 2006
61. **Invited talk**
KIAS-RIMS joint workshop on Computer Algebra
Kyoto, Japan, July 31 – August 4, 2006
“Algebraic Geometry Codes in a Pure Gröbner Basis Theoretical Setting.”
62. **Invited poster**
Special Semester on Gröbner Bases and Related Methods 2006
Workshop D1: Gröbner Bases in Cryptography, Coding Theory, and Algebraic Combinatorics
Radon Institute for Computational and Applied Mathematics
Linz, Austria, May 1–6, 2006
“Two applications of the footprint bound – estimation of generalized Hamming weights”
63. **Invited talk**
Special Semester on Gröbner Bases and Related Methods 2006
Workshop D1: Gröbner Bases in Cryptography, Coding Theory, and Algebraic Combinatorics
Radon Institute for Computational and Applied Mathematics
Linz, Austria, May 1–6, 2006
“Order Domain Codes”
64. **Contributed talk**
Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-16)
Las Vegas, NV, USA, February 20–24, 2006
(Presenting joint work with Christian Thommesen)
“On the Feng-Rao bound for generalized Hamming weights”
65. **Invited talk**
Arithmetic, Geometry, Cryptography and Coding Theory (AGCT-10)
Centre International de Recontres Mathématiques (CIRM)
Luminy (Marseille), France, September 26–30, 2005
“On the minimum distance of one-point geometric Goppa codes.”
66. **Contributed talk**
8th Nordic Combinatorial Conference
Aalborg University, Denmark, October 20–22, 2004
”On some Gröbner basis theoretical applications.”
67. **Conference organization**
(joint with L. D. Andersen)
8th Nordic Combinatorial Conference
Aalborg University, Denmark, October 20–22, 2004
68. **Workshop participation**
IEEE International Symposium on Information Theory (ISIT-2004)
Chicago Downtown Marriot, Chicago, Illinois, USA, June 27–July 2, 2004. “Codes from Order Domains.”
69. **Invited talk**
Koderungstheorie

Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach Germany, December 7–13, 2003

“On the Missing Evaluation Codes from Order Domain Theory.”

70. **Invited talk**

Arithmetic, Geometry, Cryptography and Coding Theory (AGCT-9)

Centre International de Recontres Mathématiques (CIRM), Luminy (Marseille), France,

May 18–23, 2003

“Codes from order domains.”

71. **Contributed talk**

IEEE International Symposium on Information Theory (ISIT-2002)

Palais de Beaulieu, Lausanne, Switzerland, June 30– July 5, 2002

“A Class of Gröbner Basis Theoretically Based Evaluation Codes.”

72. **Contributed talk**

Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-14)

Melbourne, Australia, November 26–30, 2001

(Presenting joint work with Tom Høholdt)

“On hyperbolic codes”

73. **Contributed talk**

IEEE International Symposium on Information Theory (ISIT-2001)

Omni Shoreham Hotel, Washington, D.C., USA, June 24–29, 2001

74. **Invited research stay**

Technical University of Denmark, 1 week 2000

75. **Invited talk**

Combinatorial Theory Seminar

Technical University of Eindhoven, The Netherlands, February 17, 1999

“Evaluation Codes from order domains.”

76. **Invited talk**

Torsdagsseminar

Department of Mathematical Sciences, Aalborg University, Denmark, May 20, 1999

“Evaluation Codes and Order Domains.”

77. **Invited talk**

Coding Theory Days

DAIMI, Aarhus University, Denmark, August 18–19, 1999

“Evaluation Codes and Order Domains.”

78. **Contributed talk**

Winter School on Coding and Information Theory 1998 (IEEE)

Ebeltoft, Denmark, December 13–16, 1998 “Evaluation Codes and Order Domains.”

79. **Invited research stay**

Technical University of Eindhoven, The Netherlands, April–July, 1998.

80. **Contributed talk**

Winter School on Coding and Information Theory 1996 (IEEE) Mølle, Sweden, December 15–18, 1996

“Presentation of PhD project.”

Popularization

1. Leading part

“Endelige legemer”

AAU Play Video

https://www.youtube.com/watch?v=_XhAAAzf0vM

2. Leading part

The film project: “10 danske matematikere – 10 matematiske fortællinger”

Publishing house: Lindhardt og Ringhof Uddannelse

Producer: Bjørn Grøn, Camera: David Binzer, 2016

“Olav Geil: Fejlkorrigerende koder”

3. Invited lecture

Regionalmøde for matematiklærere ved gymnasiale uddannelser

Aalborg Studenter Kursus, Denmark, February 3, 2016

“Hvad gør man når høstakker er for stor?”

4. Invited lecture

Ungdommens Naturvidenskabelige Forening

Aalborg, Denmark, October 14, 2014

“Hvis tale er sølv, så er mange slags tal guld.”

5. Invited lecture

Møde for Matematiklærere i Nordjyske Region

Hasseris Gymnasium, Aalborg, Denmark, November 11, 2008

“Fejlkorrigerende koder og secret sharing (samt kryptografi og netværkdkodning.)”

6. Invited lecture

Elektronik og IT-Gruppen, Ingeniørforeningen i Danmark

Aalborg, Denmark, April 24, 2008

“Moderne kryptografi.”

7. Invited lecture

Møde for Matematiklærere i Viborg og Ringkøbing amter

Viborg Gymnasium, Denmark, November 7, 2006

“Fejlkorrigerende koder, secret sharing (og kryptografi)”

8. Invited lecture

Møde for Matematikundervisere på Seminarierne

Brogården, Middelfart, Denmark, September 9, 2003

“Diskret Matematik.”

9. Invited lecture

Ungdommens Naturvidenskabelige Forening

Aalborg, Denmark, February 6, 2001
“Fejlkorrigerende koder.”

10. **Several invited lectures**

Dronninglund Gymnasium (2002, 2004), Hjørring HTX (2003), Randers Statsskole (2003), Århus Katedralskole (2003, 2004), Nørre Sundby Gymnasium (2007), Vesthimmerlands Gymnasium (visiting AAU) (2007), Frederikshavn HTX (2007)
“Kodningsteori”