

Chunlei Li - CV

Associate Professor, Department of Informatics, University of Bergen, Norway

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RESEARCH INTEREST

Coding theory, sequence design, cryptography

More than 30 publications with h-index 15 in last five years (from Google scholar)

WORKING EXPERIENCE

Associate Professor <i>Department of Informatics, University of Bergen (UiB), Norway</i>	05.2018 – Present
Researcher <i>Department of Informatics, UiB, Norway</i>	01.2017– 04.2018
Postdoc <i>Dept. of Elec. Engi. and Computer Science, University of Stavanger (UiS), Norway</i>	01.2015– 12.2016
Research Fellow <i>Department of Informatics, UiB, Norway</i>	11.2010– 12.2014
Research Assistant <i>Department of Computer Science, Wuhan University, China</i>	09.2008– 08.2010

RESEARCH PROJECTS

Sequences and Their Applications <i>8.7 MNOK, Funding Source: Research Council of Norway - IKTPULSS</i>	07.2020 – 06.2024 <i>Principle Investigator</i>
Decentralized Identity for Federated Services <i>250 KNOK, Funding Source: UH-nett Vest</i>	01.2021 – 12.2021 <i>Key Partner</i>
Secure E-Healthcare Data Sharing by Blockchain Technology <i>150 KNOK, Funding Source: UH-nett Vest</i>	01.2018 – 03.2019 <i>Principle Investigator</i>
Modern Methods and Tools for Theoretical and Applied Cryptography <i>23.1 MNOK, Funding Source: Research Council of Norway - IKTPULSS</i>	07.2015 – 06.2021 <i>Key Member</i>

PHD SUPERVISION

Ermes Franch: Rank-based Cryptography <i>Main Supervisor</i>	12.2019 – Present <i>UiB</i>
Wrya K. Kadir: Rank-metric Codes and Applications <i>Main Supervisor</i>	03.2018 – Present <i>UiB</i>
Alessandro Budroni: Cryptanalysis of LWE problems <i>Co-supervisor</i>	11.2017 – Present <i>UiB</i>
Dan Zhang: Design of Zero Correlation Zone Sequences <i>Co-supervisor</i>	04.2017 – Present <i>UiB</i>
Navid G. Bardeh: Cryptanalysis of Block Ciphers <i>Co-supervisor</i>	09.2016 – 03.2020 <i>UiB</i>
Bo Sun: Classification of APN functions <i>Co-supervisor</i>	08.2016 – 06.2018 <i>UiB</i>
Jayachander Surbiryala: Security and Privacy in Cloud Storages <i>Co-supervisor</i>	02.2016 – 12.2019 <i>UiS</i>

FACULTY SERVICE

PhD Evaluation

- Leader of Evaluation Committee - PhD thesis of Irene Villa, UiB, 06.2020
- Member of Evaluation Committee - Mid-term evaluation of Anton Tkachenco, HVL, 03.2020

PhD Defence

- Leader of PhD Defence - Katarzyna Chyzynska, UiB, 10-2019

Master Evaluation

- Internal Examiner - Sivanja Naguleswaran, UiB, 06.2020
- External Examiner - Anisa Zhurda, Holme Jrgen, UiS, 08.2020

Organization of CryptoAften1 (an educational activity)

11.2019

PROFESSIONAL SERVICES

Program Co-Chair

- International Workshop on Sequences and Their Applications, Digital, Sept. 22-25, 2020
- International Workshop on Mathematical Methods for Cryptography, Lofoten, Norway, Sept. 04-08, 2017

Program Committee

- International Workshop on Boolean Functions and their Applications (BFA)
 - * BFA-2021, Granada, Spain, Sept. 06-10, 2020
 - * BFA-2020, Loen, Norway, Sept. 14-18, 2020
- International Workshop on Signal Design and its Application (IWSDA)
 - * IWSDA-2021, Aug. 2-6, 2021, Colchester, UK
 - * IWSDA-2019, Oct. 20-24, 2019, GuangDong, China
- International Workshop on Resource Brokering with blockchain (RBChain)
 - * RBChain-2019, Dec. 10, 2019, Sydney, Australia
 - * RBChain-2018, Dec. 10, 2018, Nicosia, Cyprus
- Norwegian Information Security Conference (NISK)
 - * NISK2020, Nov. 23-25, 2020, Oslo, Norway
 - * NISK2019, Nov. 25-27, 2019, Narvik, Norway
 - * NISK2018, Sept. 19-20, 2018, Longyearbyen, Norway
 - * NISK2017, Nov. 27-29, 2017, Oslo, Norway
 - * NISK2016, Nov. 28-30, 2016, Bergen, Norway
 - * NISK2015, Nov. 23-25, 2015, Ålesund, Norway
- International Workshop on SEquences and Their Applications, Hongkong, Chinam Oct. 01-06, 2018
- International Workshop on the Arithmetic of Finite Fields, Bergen, Norway, June 14-16, 2018

Organizing Committee

- International Workshop on Boolean Functions and their Applications (BFA)
 - * BFA-2020, Sept. 14-18, Loen, Norway
 - * BFA-2018, June 17-22, Loen, Norway
 - * BFA-2017, July 3-8, 2017, Os, Norway
- International Workshop on the Arithmetic of Finite Fields (WAIFI)
 - * WAIFI-2018: June 14-16, Bergen, Norway

Guest Editor

- Editorial: Special Issue on Mathematical Methods for Cryptography. Cryptogr. Commun. 11(3), (2019)

- Editorial: Special Issue on SEquences and Their Applications. *Cryptogr. Commun.*, in progress, 2021

Peer Review (publons.com)

- IEEE Transaction on Information Theory
- IEEE Transaction on Communications
- IEEE Transaction on Cloud Computing
- Design, Codes and Cryptography
- Cryptography and Communications
- Finite Fields and Their Applications

TEACHING

INF143A - Applied Cryptography, UiB	Spring, 2021
INF140 - Introduction of Cyber Security, UiB	Spring, Autumn, 2020
INF142 - Compute Networks, UiB	Spring, 2019
INF240 - Basic Codes, UiB	Autumn, 2018
DAT510 - Security and Vulnerability in Network, UiS	Autumn, 2015, 2016

PUBLICATION

- [1] Tor Helleseeth and Chunlei Li. Pseudorandom sequences. In Cary Huffman, Jon-Lar Kim, and Patrick Solé, editors, *Concise Encyclopedia of Coding Theory*, pages 613–644. CRC Press, 2021.
- [2] Ermes Franch and Chunlei Li. Low row rank metric codes. In *Submitted to International Symposium on Information Theory*, 2021.
- [3] Wrya K. Kadir, Chunlei Li, and Ferdinando Zullo. On interpolation-based decoding of maximum rank distance codes. In *Submitted to International Symposium on Information Theory*, 2021.
- [4] Zhimin Sun, Xiangyong Zeng, Chunlei Li, Yi Zhang, and Lin Yi. The expansion complexity of ultimately periodic sequences over finite fields. *Submitted to IEEE Transaction on Information Theory*, 2020.
- [5] Haode Yan, Yongbo Xia, Chunlei Li, Tor Helleseeth, Maosheng Xiong, and Jinqun Luo. The differential spectrum of the power mapping x^{p^m-3} . *Submitted to IEEE Transaction on Information Theory*, 2020.
- [6] Yang Yang and Chunlei Li. New quaternary sequences with optimal odd-periodic autocorrelation magnitude. *Cryptogr. Commun.*, 12(3):363–374, 2020.
- [7] Chunlei Li and Yang Yang. On three conjectures of binary sequences with low odd-periodic autocorrelation. *Cryptogr. Commun.*, 12(3):427–442, 2020.
- [8] Wrya K. Kadir and Chunlei Li. On decoding additive generalized twisted gabidulin codes. *Cryptogr. Commun.*, 12(5):987–1009, 2020.
- [9] Yongbo Xia, Xianglai Zhang, Chunlei Li, and Tor Helleseeth. The differential spectrum of a ternary power mapping. *Finite Fields Their Appl.*, 64:101660, 2020.
- [10] Tor Helleseeth, Daniel J. Katz, and Chunlei Li. The resolution of Niho’s last conjecture concerning sequences, codes, and boolean functions. *Submitted to IEEE Transaction on Information Theory*, abs/2006.12239, 2020.

- [11] Kangquan Li, Chunlei Li, Tor Helleseeth, and Longjiang Qu. Binary linear codes with few weights from two-to-one functions. *IEEE Transaction on Information Theory (accepted)*, abs/2006.12395, 2020.
- [12] Kangquan Li, Chunlei Li, Tor Helleseeth, and Longjiang Qu. A complete characterization of the APN property of a class of quadrinomials. *IEEE Transaction on Information Theory (accepted)*, abs/2007.03996, 2020.
- [13] Lilya Budaghyan, Chunlei Li, and Matthew G. Parker. Editorial: Special issue on mathematical methods for cryptography. *Cryptogr. Commun.*, 11(3):363–365, 2019.
- [14] Vladimir Edemskiy, Chunlei Li, Xiangyong Zeng, and Tor Helleseeth. The linear complexity of generalized cyclotomic binary sequences of period p^n . *Des. Codes Cryptogr.*, 87(5):1183–1197, 2019.
- [15] Lisha Li, Chaoyun Li, Chunlei Li, and Xiangyong Zeng. New classes of complete permutation polynomials. *Finite Fields Their Appl.*, 55:177–201, 2019.
- [16] Xiaofang Xu, Chunlei Li, and Xiangyong Zeng. Nonsingular polynomials from feedback shift registers. *Int. J. Found. Comput. Sci.*, 30(3):469–487, 2019.
- [17] Chunlei Li, Chunming Rong, and Martin Gilje Jaatun. A cost-efficient protocol for open blockchains. In *2019 International Conference on Cyber Security and Protection of Digital Services, Cyber Security 2018, Oxford, United Kingdom, June 3-4, 2019*, pages 1–7. IEEE, 2019.
- [18] Chunlei Li. Interpolation-based decoding of nonlinear maximum rank distance codes. In *IEEE International Symposium on Information Theory, ISIT 2019, Paris, France, July 7-12, 2019*, pages 2054–2058. IEEE, 2019.
- [19] Anne Canteaut, Lukas Kölsch, Chao Li, Chunlei Li, Kangquan Li, Longjiang Qu, and Friedrich Wiemer. On the differential-linear connectivity table of vectorial boolean functions. *Submitted to Communication and Cryptography*, abs/1908.07445, 2019.
- [20] Kangquan Li, Chunlei Li, Tor Helleseeth, and Longjiang Qu. Cryptographically strong permutations from the butterfly structure. *Accepted by Design, Codes and Cryptography*, abs/1912.02640, 2019.
- [21] Zibi Xiao, Xiangyong Zeng, Chunlei Li, and Tor Helleseeth. New generalized cyclotomic binary sequences of period p^2 . *Des. Codes Cryptogr.*, 86(7):1483–1497, 2018.
- [22] Xiaofang Xu, Chunlei Li, Xiangyong Zeng, and Tor Helleseeth. Constructions of complete permutation polynomials. *Des. Codes Cryptogr.*, 86(12):2869–2892, 2018.
- [23] Ziran Tu, Xiangyong Zeng, Chunlei Li, and Tor Helleseeth. A class of new permutation trinomials. *Finite Fields Their Appl.*, 50:178–195, 2018.
- [24] Cunsheng Ding, Chunlei Li, and Yongbo Xia. Another generalisation of the binary Reed-Muller codes and its applications. *Finite Fields Their Appl.*, 53:144–174, 2018.
- [25] Jinyong Shan, Lei Hu, Xiangyong Zeng, and Chunlei Li. A construction of 1-resilient boolean functions with good cryptographic properties. *J. Syst. Sci. Complex.*, 31(4):1042–1064, 2018.
- [26] Guang Yang and Chunlei Li. A design of blockchain-based architecture for the security of electronic health record (EHR) systems. In *2018 IEEE International Conference on Cloud Computing Technology and Science, CloudCom 2018, Nicosia, Cyprus, December 10-13, 2018*, pages 261–265. IEEE Computer Society, 2018.

- [27] Yongbo Xia and Chunlei Li. Three-weight ternary linear codes from a family of power functions. *Finite Fields Their Appl.*, 46:17–37, 2017.
- [28] Adel Alahmadi, Hussain Alhazmi, Shakir Ali, Tor Helleseth, Rola Hijazi, Chunlei Li, and Patrick Solé. An analogue of the \mathbb{Z}_4 -goethals code in non-primitive length. *J. Syst. Sci. Complex.*, 30(4):950–966, 2017.
- [29] Zhimin Sun, Xiangyong Zeng, Chunlei Li, and Tor Helleseth. Investigations on periodic sequences with maximum nonlinear complexity. *IEEE Trans. Inf. Theory*, 63(10):6188–6198, 2017.
- [30] Chunlei Li and Tor Helleseth. Quasi-perfect linear codes from planar and APN functions. *Cryptogr. Commun.*, 8(2):215–227, 2016.
- [31] Cunsheng Ding, Chunlei Li, Nian Li, and Zhengchun Zhou. Three-weight cyclic codes and their weight distributions. *Discret. Math.*, 339(2):415–427, 2016.
- [32] Chaoyun Li, Xiangyong Zeng, Chunlei Li, Tor Helleseth, and Ming Li. Construction of de bruijn sequences from lfsrs with reducible characteristic polynomials. *IEEE Trans. Inf. Theory*, 62(1):610–624, 2016.
- [33] Xinjiao Chen, Chunlei Li, and Chunming Rong. Perfect gaussian integer sequences from cyclic difference sets. In *IEEE International Symposium on Information Theory, ISIT 2016, Barcelona, Spain, July 10-15, 2016*, pages 115–119. IEEE, 2016.
- [34] Yongbo Xia, Tor Helleseth, and Chunlei Li. Some new classes of cyclic codes with three or six weights. *Adv. Math. Commun.*, 9(1):23–36, 2015.
- [35] Jiao Li, Claude Carlet, Xiangyong Zeng, Chunlei Li, Lei Hu, and Jinyong Shan. Two constructions of balanced boolean functions with optimal algebraic immunity, high nonlinearity and good behavior against fast algebraic attacks. *Des. Codes Cryptogr.*, 76(2):279–305, 2015.
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- [37] Nian Li, Chunlei Li, Tor Helleseth, Cunsheng Ding, and Xiaohu Tang. Optimal ternary cyclic codes with minimum distance four and five. *Finite Fields Their Appl.*, 30:100–120, 2014.
- [38] Yongbo Xia, Shaoping Chen, Tor Helleseth, and Chunlei Li. Cross-correlation between a p -ary m -sequence and its all decimated sequences for $d = (p^m + 1)(p^m + p - 1)/(p + 1)$. *IEICE Trans. Fundam. Electron. Commun. Comput. Sci.*, 97-A(4):964–969, 2014.
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- [41] Yongbo Xia, Chunlei Li, Xiangyong Zeng, and Tor Helleseth. Some results on cross-correlation distribution between a p -ary $\setminus(m\setminus)$ -sequence and its decimated sequences. *IEEE Trans. Inf. Theory*, 60(11):7368–7381, 2014.
- [42] Chaoyun Li, Xiangyong Zeng, Chunlei Li, and Tor Helleseth. A class of de bruijn sequences. *IEEE Trans. Inf. Theory*, 60(12):7955–7969, 2014.

- [43] Jie Li, Xiangyong Zeng, Xiaohu Tang, and Chunlei Li. A family of quadriphase sequences of period $4(2^n - 1)$ with low correlation and large linear span. *Des. Codes Cryptogr.*, 67(1):19–35, 2013.
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- [45] Chunlei Li, Nian Li, and Matthew G. Parker. Complementary sequence pairs of types II and III. *IEICE Trans. Fundam. Electron. Commun. Comput. Sci.*, 95-A(11):1819–1826, 2012.
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- [47] Chunlei Li and Tor Helleseth. New nonbinary sequence families with low correlation and large linear span. In *Proceedings of the 2012 IEEE International Symposium on Information Theory, ISIT 2012, Cambridge, MA, USA, July 1-6, 2012*, pages 1411–1415. IEEE, 2012.
- [48] Guang Gong, Tor Helleseth, Honggang Hu, and Chunlei Li. New three-valued walsh transforms from decimations of helleseth-gong sequences. In Tor Helleseth and Jonathan Jedwab, editors, *Sequences and Their Applications - SETA 2012 - 7th International Conference, Waterloo, ON, Canada, June 4-8, 2012. Proceedings*, volume 7280 of *Lecture Notes in Computer Science*, pages 327–337. Springer, 2012.
- [49] Huanguo Zhang, Chunlei Li, and Ming Tang. Capability of evolutionary cryptosystems against differential cryptanalysis. *Sci. China Inf. Sci.*, 54(10):1991–2000, 2011.
- [50] Huanguo Zhang, Chunlei Li, and Ming Tang. Evolutionary cryptography against multidimensional linear cryptanalysis. *Sci. China Inf. Sci.*, 54(12):2565–2577, 2011.
- [51] Houzhen Wang, Huanguo Zhang, Qianhong Wu, Yu Zhang, Chunlei Li, and Xinyu Zhang. Design theory and method of multivariate hash function. *Sci. China Inf. Sci.*, 53(10):1977–1987, 2010.
- [52] Claude Carlet, Xiangyong Zeng, Chunlei Li, and Lei Hu. Further properties of several classes of boolean functions with optimum algebraic immunity. *Des. Codes Cryptogr.*, 52(3):303–338, 2009.