Han Mao Kiah

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Academic Qualifications

2010–2014 PH. D. in Mathematics, Nanyang Technological University, Singapore
SUPERVISOR: Prof. Yeow Meng Chee
THESIS TITLE: Reliable Communications over Power Lines through Coded Modulation Schemes

2002–2006 B. SC. in Mathematics, 1st Class Honours, National University of Singapore, Singapore

Summary of Working Experience

Aug 2018 – present — Assistant Professor at School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore
RESEARCH AREAS:
- Design and analysis of codes and algorithms for distributed storage networks.
- Design of codes for DNA information storage.

May 2015 – Aug 2018 — Lecturer at School of Physical and Mathematical Sciences Nanyang Technological University, Singapore

Apr 2015 – May 2015 — Research Fellow at School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore

Feb 2014 – Feb 2015 — Postdoctoral Research Associate at Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, USA
SUPERVISOR: Assoc. Prof. Olgica Milenkovic
RESEARCH AREAS:
- Design of synchronization algorithms for distributed storage networks.
- Design of codes for DNA information storage.

Aug 2013 – Feb 2014 — Project Officer at School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore
SUPERVISOR: Prof. Yeow Meng Chee
RESEARCH AREAS:
- Adapting classical codes for modern applications like physically unclonable functions and flash memories.
- Using combinatorial design theory to construct optimal codes in Enomoto-Katona space.

Academic Honours and Awards

2010–2013 Research Scholarship under National Research Foundation - Competitive Research Programme
2006 Singapore Mathematical Society Medal and Prize
2006 Singapore National Academy of Science Award
2002–2006 Dean's List, National University of Singapore
2004 Lim Soo Peng Book Prize

Research Summary

Key Areas of Research

Coding Theory

- Design and analysis of encoding and decoding schemes.
- Applications to modern data storage, communication, and distributed computing scenarios
- Bounds on the size and constructions of optimal codes.

Combinatorics

- Construction of combinatorial designs with application to codes.
- Methods in enumerative and extremal combinatorics.
- Asymptotic analysis of algorithms

Specific Research Interests

- Coding for storage of data on synthetic DNA strands: sequence reconstruction problem, constrained coding, bee-identification problem
- Low-bandwidth, verifiable, privacy-preserving schemes for distributed applications: private information retrieval, distributed computing

Research Awards / Recognition

2019 2018 SPMS Young Researcher Award

2020 International Symposium on Information Theory and Its Applications 2020 Best Student Paper Award winner (Student: *J. Chrisnata*)

2022 International Symposium on Information Theory and Its Applications 2022 Early Career Researcher Paper Award Winner (Researcher: *D. T. Dao*)

Invited Presentations

2023 "The Bee Identification Problem and DNA-Based Data Storage" *59th Annual Allerton Conference on Communication, Control, and Computing, Monticello, USA*

2023 "The Bee Identification Problem and DNA-Based Data Storage" *METU EEE Seminar, Online*

2023 "Sequence Reconstruction Problems for Deletions" *Coding and Information Theory Israel Conference 2023, Tel Aviv, Israel*

2022 "Balancing a la Knuth: Generalizations and Applications for DNA-based Data Storage" *Vietnam Institute for Advanced Study in Mathematics, Hanoi, Vietnam*

2022 "Sequence Reconstruction Problems for Deletions" *Munich Workshop on Coding and Cryptography 2022, Germany*

2022 "Sequence Reconstruction Problems for Deletions" *Taizhou University, China, Online*

2022 "Sequence Reconstruction Problems for Deletions" *Shanghai Jiao Tong University, China, Online*

2022 "Sequence Reconstruction Problems for Deletions" *Taizhou University, China, Online*

2022 "Sequence Reconstruction Problem for Deletion Channels: A Complete Asymptotic Solution" *ITA Workshop 2022, San Diego, USA*

2020 "Balancing a la Knuth for DNA-based Data Storage" *Colloquium on Combinatorial Designs, Online*

2020 "Balancing a la Knuth for DNA-based Data Storage" *Hyderabad Workshop on Information Theory, Online*

2019 "Efficient and Explicit Balanced Primer Codes" *ITA Workshop 2019, San Diego, USA*

2018 "You don't have to buy Bitcoin. You can mine it." *SMS Lecture Series 2018, Singapore*
2017 "Cooling Codes: Thermal-Management Coding for High-Performance Interconnects" *17th Annual Henry Taub TCE Conference, Haifa, Israel*
2016 "Bounds and Constructions for Geometric Orthogonal Codes" *55th Annual Allerton Conference on Communication, Control, and Computing, Monticello, USA*
2015 "Coding for DNA Based Storage: New Problems, Old Tools" *Workshop on Coding Techniques for Synthetic Biology, Urbana-Champaign, USA*

List of Publications

Journal articles

[J50] H. M. Kiah, K. Goyal (2024). "Evaluating the Gilbert-Varshamov Bound for Constrained Systems", *Entropy*, vol. 26, no. 4, 346
[J49] H. M. Kiah, W. Kim, S. Kruglik, S. Ling, H. Wang (2024). "Explicit Low-Bandwidth Evaluation Schemes for Weighted Sums of Reed-Solomon-Coded Symbols", *IEEE Transactions on Information Theory*, Accepted Feb 2024
[J48] D. T. Dao, H. M. Kiah, T. T. Nguyen (2024). "Efficient Encoding of Binary Constant-Weight Codes: Variable-Length Balancing Schemes a la Knuth", *IEEE Transactions on Information Theory*, Accepted Jan 2024
[J47] J. Chrisnata, H. M. Kiah, A. Vardy, E. Yaakobi (2023). "Bee Identification Problem for DNA Strands", *IEEE Journal on Selected Areas in Information Theory*, vol. 4, pp. 190–204
[J46] H. M. Kiah, A. Vardy, H. Yao (2023). "Efficient Algorithms for the Bee Identification Problem", *IEEE Journal on Selected Areas in Information Theory*, vol. 4, pp. 205–218
[J45] T. T. Nguyen, K. Cai, H. M. Kiah, K. A. S. Immink, Y. M. Chee (2023). "Two-Dimensional RC/SW Constrained Codes: Bounded Weight and Almost Balanced Weight", *IEEE Transactions on Information Theory*, vol. 69, no. 8, pp. 4961–4976
[J44] J. Chrisnata, H. M. Kiah, E. Yaakobi (2022). "Correcting Deletions with Multiple Reads", *IEEE Transactions on Information Theory*, vol. 68, no. 11, pp. 7141–7158
[J43] K. Cai, H. M. Kiah, T. T. Nguyen, E. Yaakobi (2022). "Coding for Sequence Reconstruction for Single Edits", *IEEE Transactions on Information Theory*, vol. 68, no. 1, pp. 66–79
[J42] Y. M. Chee, T. Etzion, H. M. Kiah, A. Vardy (2021). "Domination mappings into the Hamming ball: Existence, constructions, and algorithms", *Advances in Mathematics of Communications*, 2021
[J41] J. Chrisnata, H. M. Kiah, S. R. Karingula, A. Vardy, E. Yaakobi, H. Yao (2021). "On the number of distinct k-decks: Enumeration and bounds", *Advances in Mathematics of Communications*, 2021
[J40] Y. M. Chee, H. M. Kiah, S. Marcovich, A. Vardy, V. K. Vu, E. Yaakobi (2021). "Locally-Constrained de Bruijn Codes: Properties, Enumeration, Code Constructions, and Applications", *IEEE Transactions on Information Theory*, vol. 67, no. 12, pp. 7857–7875
[J39] K. Cai, Y. M. Chee, R. Gabrys, H. M. Kiah, T. T. Nguyen (2021). "Correcting a single indel/edit for DNA-based data storage: Linear-time encoders and order-optimality", *IEEE Transactions on Information Theory*, vol. 67, no. 6, pp. 3438–3451
[J38] H. Dau, D. T. Xinh, H. M. Kiah, T. T. Luong, O. Milenkovic (2021). "Repairing Reed-Solomon Codes via Subspace Polynomials", *IEEE Transactions on Information Theory*, vol. 67, no. 10, pp. 6395–6407
[J37] Y. M. Chee, T. Etzion, H. M. Kiah, A. Vardy, C. Wang (2021). "Explicit Baranyai Partitions for Quadruples, Part I: Quadrupling Constructions", *Journal of Combinatorial Designs*, vol. 29, no. 7, pp. 447–481
[J36] T. T. Nguyen, K. Cai, K. A. S. Immink, H. M. Kiah (2021). "Capacity-Approaching Constrained Codes with Error Correction for DNA-Based Data Storage", *IEEE Transactions on Information Theory*, vol. 67, no. 8, pp. 5602–5613
[J35] Y. M. Chee, H. M. Kiah, H. Zhang (2021). "Lower Bounds for Total Storage of Multiset

Combinatorial Batch Codes Using Linear Programming", *IEEE Transactions on Information Theory*, vol. 67, no. 1, pp. 255–267

[J34] H. M. Kiah, A. Tandon, M. Motani (2021). "Generalized Sphere-Packing Bound for Subblock-Constrained Codes", *IEEE Transactions on Information Theory*, vol. 67, no. 1, pp. 187–199

[J33] Y. M. Chee, H. M. Kiah, H. Wei (2020). "Efficient and Explicit Balanced Primer Codes", *IEEE Transactions on Information Theory*, vol. 66, no. 9, pp. 5344–5357

[J32] Y. M. Chee, J. Chrisnata, H. M. Kiah, T. T. Nguyen (2020). "Efficient Encoding/Decoding of GC-Balanced Codes Correcting Tandem Duplications", *IEEE Transactions on Information Theory*, vol. 66, no. 8, pp. 4892–4818

[J31] Y. M. Chee, T. Etzion, H. M. Kiah, A. Vardy, H. Wei (2020). "Low-Power Cooling Codes with Efficient Encoding and Decoding", *IEEE Transactions on Information Theory*, vol. 66, no. 8, pp. 4804–4818

[J30] Y. M. Chee, H. M. Kiah, A. Vardy, E. Yaakobi (2020). "Explicit and Efficient WOM codes of Finite Length", *IEEE Transactions on Information Theory*, vol. 66, no. 5, pp. 2669–2682

[J29] Y. M. Chee, D. T. Dao, H. M. Kiah, S. Ling, H. Wei (2020). "Robust Positioning Patterns with Low Redundancy", *SIAM Journal on Computing*, vol. 49, no. 2, pp. 284-–317

[J28] Y. M. Chee, J. Chrisnata, H. M. Kiah, S. Ling, T. T. Nguyen, V. K. Vu (2019). "Capacity-Achieving Codes that Mitigate Intercell Interference and Charge Leakage in Flash Memories", *IEEE Transactions on Information Theory*, vol. 65, no. 6, pp. 3702–3712

[J27] Y. M. Chee, J. Chrisnata, H. M. Kiah, T. T. Nguyen (2019). "Deciding the Confusability of Words under Tandem Repeats in Linear Time", *ACM Transactions on Algorithms*, vol. 15, no. 3, Article 42

[J26] Y. M. Chee, F. Gao, H. M. Kiah, A. C. H. Ling, H. Zhang, X. Zhang (2019). "Decompositions of edge-colored digraphs: a new technique in the construction of constant-weight codes and related families", *SIAM Journal on Discrete Mathematics*, vol. 33, no. 1, pp. 209–229

[J25] Y. M. Chee, H. M. Kiah, A. Vardy, V. K. Vu, E. Yaakobi (2018). "Coding for Racetrack Memories", *IEEE Transactions on Information Theory*, vol. 64, no. 11, pp. 7094–7112

[J24] A. Tandon, H. M. Kiah, M. Motani (2018). "Bounds on the Size and Asymptotic Rate of Subblock-Constrained Codes", *IEEE Transactions on Information Theory*, vol. 64, no. 10, pp. 6604–6619

[J23] H. Dau, I. Duursma, H. M. Kiah, O. Milenkovic (2018). "Repairing Reed-Solomon Codes With Multiple Erasures", *IEEE Transactions on Information Theory*, vol. 64, no. 10, pp.6567–6582

[J22] S. M. T. Yazdi, H. M. Kiah, R. Gabrys, O. Milenkovic (2018). "Mutually Uncorrelated Primers for DNA-Based Data Storage", *IEEE Transactions on Information Theory*, vol. 64, no. 9, pp.6283–6296

[J21] Y. M. Chee, H. M. Kiah, S. Ling, and H. Wei (2018). "Geometric Orthogonal Codes of Size Larger than Optical Orthogonal Codes", *IEEE Transactions on Information Theory*, vol. 64, no. 4, pp. 2883–2895

[J20] Y. M. Chee, T. Etzion, H. M. Kiah, A. Vardy (2018). "Cooling Codes: Thermal-Management Coding for High-Performance Interconnects", *IEEE Transactions on Information Theory*, vol. 64, no. 4, pp. 3062–3085

[J19] Z. Chang, J. Chrisnata, M. F. Ezerman, H. M. Kiah (2017). "Rates of DNA Sequence Profiles for Practical Values of Read Lengths", *IEEE Transactions on Information Theory*, vol. 63, no. 11, pp. 7166–7177

[J18] R. Gabrys, H. M. Kiah, O. Milenkovic (2017). "Asymmetric Lee Distance Codes for DNA-Based Storage", *IEEE Transactions on Information Theory*, vol. 63, no. 8, pp. 4982–4995

[J17] Y. M. Chee, H. M. Kiah, H. Zhang, X. Zhang (2017). "Constructions of Optimal and Near-Optimal Multiply Constant-Weight Codes", *IEEE Transactions on Information Theory*, vol. 63, no. 6, pp. 3621–3629

[J16] Z. Wang, H. M. Kiah, Y. Cassuto, J. Bruck (2017). "Switch Codes: Codes for Fully Parallel Reconstruction", *IEEE Transactions on Information Theory*, vol. 63, no. 4, pp.2061–2075

[J15] S. El Rouayheb, S. Goparaju, H. M. Kiah, O. Milenkovic (2016). "Synchronization and Deduplication in Coded Distributed Storage Networks", *IEEE/ACM Transactions on Networking*, vol. 24 no. 5, pp.3056–3069

[J14] H. M. Kiah, G. J. Puleo, O. Milenkovic (2016). "Codes for DNA Sequence Profiles", *IEEE Transactions on Information Theory*, vol. 62, no. 6, pp. 3125–3146

[J13] S. M. H. Tabatabaei Yazdi, H. M. Kiah, E. R. Garcia, J. Ma, H. Zhao, O. Milenkovic (2015). "DNA-Based Storage: Trends and Methods", *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, Invited paper. vol. 1, no. 3, pp.230–248

[J12] Y. M. Chee, H. M. Kiah, P. Purkayastha, P. Sol'e (2015). "Product Construction of Affine Codes", *SIAM Journal on Discrete Mathematics*, vol. 29, no. 3, pp. 1540–1552

[J11] Y. M. Chee, H. M. Kiah, A.C.H. Ling, C. Wang (2015). "Generalized Balanced Tournament Packings and Optimal Equitable Symbol Weight Codes for Power Line Communications", *Journal of Combinatorial Designs*, vol. 23, no. 4, pp. 151–182

[J10] Y. M. Chee, H. M. Kiah, H. Zhang, X. Zhang (2015). "Optimal Codes in the Enomoto-Katona Space", *Combinatorics, Probability and Computing*, vol. 24, no. 2, pp. 382–406

[J9] Y. M. Chee, Z. Cherif, J.-L. Danger, S. Guilley, H. M. Kiah, J. L. Kim, Patrick Sol'e, X. Zhang (2014). "Multiply Constant-Weight Codes and the Reliability of Loop Physically Unclonable Functions", *IEEE Transactions on Information Theory*, vol. 60, no. 11, pp. 7026–7034

[J8] Y. M. Chee, L. Ji, H. M. Kiah, C. Wang, J. Yin (2013). "Maximum Distance Separable Codes for Symbol-Pair Read Channels", *IEEE Transactions on Information Theory*, vol. 59, no. 11, pp. 7259–7267

[J7] Y. M. Chee, H. M. Kiah, P. Purkayastha, C. Wang (2013). "Importance of Symbol Equity in Coded Modulation for Power Line Communications", *IEEE Transactions on Communications*, vol. 61, no. 10, pp. 4381–4390

[J6] M. F. Ezerman, S. Jitman, H. M. Kiah, S. Ling (2013). "Pure Asymmetric Quantum MDS Codes from CSS Construction: a Complete Characterization", *International Journal of Quantum Information*, vol. 11, no. 3, 1350027

[J5] Y. M. Chee, H. M. Kiah, C. Wang (2013). "Generalized Balanced Tournament Designs with Block Size Four", *Electronic Journal of Combinatorics*, vol.20(2), P51

[J4] Y. M. Chee, H. M. Kiah, P. Purkayastha, C. Wang (2013). "Cross-Bifix-Free Codes Within a Constant Factor of Optimality", *IEEE Transactions on Information Theory*, vol. 59, no. 7, pp. 4668 – 4674

[J3] Y. M. Chee, H. M. Kiah, P. Purkayastha (2013). "Estimates on the Size of Symbol Weight Codes", *IEEE Transactions on Information Theory*, vol. 59, no. 1, pp. 301–314

[J2] H. M. Kiah, K. H. Leung, S. Ling (2012). "A note on cyclic codes over $\mathrm{GR}(p^2, m)$ of length p^k", *Designs, Codes and Cryptography*, vol. 63, issue 1, pp. 105–112

[J1] H. M. Kiah, K. H. Leung, S. Ling (2008). "Cyclic codes over $\mathrm{GR}(p^2, m)$ of length p^k", *Finite Fields and Their Applications*, vol. 14, 834–846

Magazine

[M1] O. Milenkovic, R. Gabrys, H. M. Kiah, S. M. T. Yazdi, (2018). "Exabytes in a Test Tube: The Case for DNA Data Storage", *IEEE Spectrum*, Invited paper. Cover for May 2018.

Conference proceedings

[C83] S. Singhvi, R. Con, H. M. Kiah, E. Yaakobi (2024). "An Optimal Sequence Reconstruction Algorithm for Reed-Solomon Codes", *Proceedings of the 2024 IEEE International Symposium on Information Theory*, Accepted Apr 2024

[C82] S. Kruglik, H. M. Kiah, S. H. Dau, E. Yaakobi (2024). "Private Repair of a Single Erasure in Reed Solomon Codes", *Proceedings of the 2024 IEEE International Symposium on Information Theory*, Accepted Apr 2024

[C81] T. X. Dinh, B. T. Le, S. H. Dau, S. Boztas, S. Kruglik, H. M. Kiah, E. Viterbo, T. Etzion, Y. M. Chee (2024). "Repairing a Single Erasure in Reed-Solomon Codes with Side Information", *Proceedings of the 2024 IEEE International Symposium on Information Theory*, Accepted Apr 2024

[C80] Y. M. Chee, S. H. Dau, T. Etzion, H. M. Kiah, Y. Luo, W. Zhang (2024). "Decoding Sparse

Reed-Solomon Codes with Known Support", *Proceedings of the 2024 IEEE International Symposium on Information Theory*, Accepted Apr 2024

[C79] W. Kim, J. N. Raj, S. Kruglik, H. M. Kiah (2024). "Decoding Sparse Reed-Solomon Codes with Known Support", *Proceedings of the 2024 IEEE International Symposium on Information Theory*, Accepted Apr 2024

[C78] K. H. Chen, D. T. Dao, H. M. Kiah, V. L. P. Pham, E. Yaakobi (2024). "Noise-Tolerant Codebooks for Semi-Quantitative Group Testing: Application to Spatial Genomics", *Proceedings of the 2024 IEEE International Symposium on Information Theory*, Accepted Apr 2024

[C77] S. Singhvi, A. Boruchovsky, H. M. Kiah, E. Yaakobi (2023). " Data-Driven Bee Identification for DNA Strands", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 797–802

[C76] S. Kruglik, S. H. Dau, H. M. Kiah, H. Wang (2023). "K-Server Byzantine-Resistant PIR Scheme with Optimal Download Rate and Optimal File Size", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 1532–1537

[C75] S. Kruglik, G. Luo, W. Kim, S. Singhvi, H. M. Kiah, S. Ling, H. Wang (2023). "Repair of Reed-Solomon Codes in the Presence of Erroneous Nodes", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 1003–1008

[C74] T. T. Nguyen, K. Cai, H. M. Kiah, T. D. Dao, K. A. S. Immink (2023). "On the Design of Codes for DNA Computing: Secondary Structure Avoidance Codes", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 573–578

[C73] K. Goyal, H. M. Kiah, M. Kovacevic, T. D. Dao (2023). "Evaluation of the Gilbert-Varshamov Bound Using Multivariate Analytic Combinatorics", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 2458–2463

[C72] S. Kruglik, S. H. Dau, H. M. Kiah, H. Wang (2023). "Two-Server Private Information Retrieval with Optimized Download Rate and Result Verification", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 1354–1359

[C71] H. M. Kiah, W. Kim, S. Kruglik, S. Ling, H. Wang (2023). "Explicit Low-Bandwidth Evaluation Schemes for Weighted Sums of Reed-Solomon-Coded Symbols", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 1973–1978

[C70] J. Chrisnata, H. M. Kiah, V. L. P. Pham (2023). "Deletion Correcting Codes for Efficient DNA Synthesis", *Proceedings of the 2023 IEEE International Symposium on Information Theory*, Taipei, pp. 352–357

[C69] J. Li, Z. Wang, G. Cong, C. Long, H. M. Kiah, B. Cui (2023). "Towards Designing and Learning Piecewise Space-Filling Curves", *Proceedings of the VLDB Endowment*, vol. 16, no. 9, pp. 2158–2171

[C68] Q. Cao, H. Y. Tran, S. H. Dau, X. Yi, E. Viterbo, C. Feng, Y.-C. Huang, J. Zhu, S. Kruglik, H. M. Kiah (2023). "Committed Private Information Retrieval", *European Symposium on Research in Computer Security 2023*, pp. 393-413

[C67] W. Kim, S. Kruglik, H. M. Kiah (2023). "Coded Computation of Multiple Functions", *Information Theory Workshop 2023*, pp.468–473

[C66] D. T. Dao, H. M. Kiah, T. T. Nguyen (2022). "Average Redundancy of Variable-Length Balancing Schemes à la Knuth", *International Symposium on Information Theory and Its Applications 2022*, Tsukuba, Accepted Jul. 2022

[C65] Y. Chen, K. Feng, G. Cong, H. M. Kiah (2022). "Example-based Spatial Pattern Matching", *Proceedings of the VLDB Endowment*, vol. 15, no. 11, pp. 2572–2584

[C64] T. T. Nguyen, K. Cai, H. M. Kiah, K. A. S. Immink, Y. M. Chee (2022). "Using One Redundant Bit to Construct Two-Dimensional Almost-Balanced Codes", *Proceedings of the 2022 IEEE International Symposium on Information Theory*, Aalto, pp. 3091–3096

[C63] K. Goyal, H. M. Kiah (2022). "Evaluating the Gilbert-Varshamov Bound for Constrained Systems", *Proceedings of the 2022 IEEE International Symposium on Information Theory*, Aalto, pp. 1348–1353

[C62] V. L. P. Pham, K. Goyal, H. M. Kiah (2022). "Sequence Reconstruction Problem for Deletion Channels: A Complete Asymptotic Solution", *Proceedings of the 2022 IEEE International Symposium on Information Theory*, Aalto, pp. 992–997

[C61] J. Chrisnata, H. M. Kiah, A. Vardy, E. Yaakobi (2022). "Bee Identification Problem for DNA Strands", *Proceedings of the 2022 IEEE International Symposium on Information Theory*, Aalto, pp. 969–974

[C60] Y. M. Chee, D. T. Dao, T. Etzion, H. M. Kiah, H. Zhang (2021). "Regular Multiset Combinatorial Batch Codes over Vector Spaces", *Proceedings of the 2021 IEEE International Symposium on Information Theory*, Melbourne, pp. 3133–3138

[C59] J. Chrisnata, H. M. Kiah (2021). "Correcting Two Deletions with More Reads", *Proceedings of the 2021 IEEE International Symposium on Information Theory*, Melbourne, pp. 2666–2671

[C58] K. Cai, H. M. Kiah, M. Motani, T. T. Nguyen (2021). "Coding for Segmented Edits with Local Weight Constraints", *Proceedings of the 2021 IEEE International Symposium on Information Theory*, Melbourne, pp. 1694–1699

[C57] H. M. Kiah, A. Vardy, H. Yao (2021). "Efficient Bee Identification", *Proceedings of the 2021 IEEE International Symposium on Information Theory*, Melbourne, pp. 1943–1948

[C56] K. Cai, Y. M. Chee, R. Gabrys, H. M. Kiah, T. T. Nguyen (2021). "Single Indel/Edit Correcting Codes: Linear-Time Encoders and Order-Optimality", *12th Annual Non-Volatile Memories Workshop*,

[C55] J. Chrisnata, H. M. Kiah, E. Yaakobi (2021). "Optimal Reconstruction Codes for Deletion Channels", *12th Annual Non-Volatile Memories Workshop*,

[C54] J. Chrisnata, H. M. Kiah, E. Yaakobi (2020). "Optimal Reconstruction Codes for Deletion Channels", *International Symposium on Information Theory and Its Applications 2020*, Hawaii, pp. 279–283

[C53] D. T. Dao, H. M. Kiah, H. Wei (2020). "Maximum Length of Robust Positioning Sequences", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 108–113

[C52] R. Gabrys, H. M. Kiah, A. Vardy, E. Yaakobi, Y. Zhang (2020). "Locally Balanced Constraints", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 664–669

[C51] Y. M. Chee, T. Etzion, H. M. Kiah, H. Zhang (2020). "Recovery Sets for Subspaces from a Vector Space", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 542–547

[C50] U. Gupta, H. M. Kiah, A. Vardy, H. Yao (2020). "Polar Codes with Balanced Codewords", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 700–705

[C49] T. T. Nguyen, K. Cai, K. A. S. Immink, H. M. Kiah (2020). "Constrained Coding with Error Control for DNA-Based Data Storage", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 694–699

[C48] H. M. Kiah, T. T. Nguyen, E. Yaakobi (2020). "Coding for Sequence Reconstruction for Single Edits", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 686–681

[C47] Y. M. Chee, J. Chrisnata, T. Etzion, H. M. Kiah (2020). "Efficient Algorithm for the Linear Complexity of Sequences and Some Related Consequences", *Proceedings of the 2020 IEEE International Symposium on Information Theory*, Los Angeles, pp. 2897–2902

[C46] K. Cai, Xuan He, Han Mao Kiah, Tuan Thanh Nguyen (2020). "Efficient Constrained Encoders Correcting a Single Nucleotide Edit in DNA Storage", *Proceedings of 45th International Conference on Acoustics, Speech, and Signal Processing*, pp. 8827–8830

[C45] J. Chrisnata, H. M. Kiah, S. Rao, A. Vardy, E. Yaakobi, H. Yao (2019). "On the Number of Distinct k-Decks: Enumeration and Bounds", *Proceedings of the 19th International Symposium on Communications and Information Technologies*, Ho Chi Minh City, 519–524

[C44] Y. M. Chee, H. M. Kiah, H. Zhang (2019). "Lower Bounds for Total Storage of Multiset Combinatorial Batch Codes using Linear Programming", *Proceedings of the 2019 IEEE International Symposium on Information Theory*, Paris, pp. 2364–2368

[C43] Y. M. Chee, T. Etzion, H. M. Kiah, V. K. Vu, E. Yaakobi (2019). "Constrained de Bruijn Codes and their Applications", *Proceedings of the 2019 IEEE International Symposium on Information Theory*, Paris, pp. 2370–2374

[C42] Y. M. Chee, H. M. Kiah, A. J. H. Vinck, V. K. Vu, E. Yaakobi (2019). "Coding for Write ℓ-step-up Memories", *Proceedings of the 2019 IEEE International Symposium on Information Theory*, Paris, pp. 1597–1601

[C41] H. M. Kiah, A. Tandon, M. Motani (2019). "Generalized Sphere-Packing Bound for Subblock-Constrained Codes", *Proceedings of the 2019 IEEE International Symposium on Information Theory*, Paris, pp. 1737–1741

[C40] Y. M. Chee, H. M. Kiah, E. Yaakobi, H. Zhang (2019). "A Generalization of Blackburn-Etzion Construction for Private Information Retrieval Array Codes", *Proceedings of the 2019 IEEE International Symposium on Information Theory*, Paris, pp. 1062–1066

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Professional Services

Organising Committee

2020-2021 Information Theory in Singapore (ITIS)

2018 International Symposium on Information Theory and Its Applications, Singapore (Local Arrangement)

2018 Conference on Combinatorics and its Applications, Singapore

2018 Japan-Singapore Workshop on Coding and Information Theory, Singapore

2017 Joint Korea-Singapore Workshop on Discrete Mathematics, Singapore

2015 Workshop on Coding Techniques for Synthetic Biology, Urbana-Champaign, USA

Teaching Summary

Awards

2020 SPMS Teaching Excellence Award AY 2018-2019, Nanyang Technological University
2018 SPMS Teaching Excellence Award AY 2016-2017, Nanyang Technological University
2017 SPMS Teaching Excellence Award AY 2015-2016, Nanyang Technological University
2013 Teaching Assistant Award, Nanyang Technological University

Courses Taught at Nanyang Technological University

2022 "Algorithms and Theory of Computing" (Graduate level, shared with Guohua Wu), Lecturer
2022-24 "Linear Algebra II" (Undergraduate level), Lecturer
2018-24 "Operations Research I and II" (Graduate level), Lecturer
2018 "Algorithms and Computing 2" (Undergraduate level), Teaching Assistant
2017,20-24 "Combinatorics" (Undergraduate level), Lecturer
2016-19 "Algorithms in the Real World" (Undergraduate level), Lecturer
2016 "Engineering Mathematics 2" (Undergraduate level), Teaching Assistant
2015-19, 21 "It's a Discreetly Discrete World: Real World Applications of Mathematics" (Undergraduate level), Lecturer
2015 "Probability and Statistics" (Undergraduate level), Lecturer
2013 "Linear Algebra 1" (Undergraduate level), Teaching Assistant
2013 "Real Analysis" (Undergraduate level), Teaching Assistant
2012 "Enumerative Combinatorics" (Graduate / Undergraduate level), Teaching Assistant