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List of Publications

A. IEEE Transactions, Letters, ISIT

1. Anamika Singh and **Abhay Kumar Singh** "Function-Correcting Codes for Insertion-Deletion Channels" **IEEE Transactions on Information Theory** Accepted, 2026.
2. Siddharth Bhoi **Abhay Kumar Singh**, and Kishan "Construction of Primers for DNA-Based Storage Systems" **IEEE Transactions on NanoBioscience**, DOI:10.1109/TNB.2026.3720321, 2026.
3. G. K. Verma, A. Singh and **Abhay Kumar Singh** "Function-Correcting b-Symbol Codes for Locally $(, b)$ -Functions" **IEEE Transactions on Information Theory** vol. 72, no. 1, pp. 331-341, Jan. 2026, doi: 10.1109/TIT.2025.3633259.
4. Gyanendra K Verma, Nupur, and **Abhay Kumar Singh** Code Size Constraints in b-Symbol Read Channels: A Bound Analysis. **IEEE Transactions on Information Theory**, vol. 71, no. 12, pp. 9496-9505 (2025) DOI: 10.1109/TIT.2025.3622757.
5. H Q Dinh, B T Nguyen, **Abhay Kumar Singh**, and S Sriboonchitta. On the symbol-pair distance of repeated-root constacyclic codes of prime power lengths. **IEEE Transactions on Information Theory**, 64(4):24172430, 2018.
6. H Q Dinh, **Abhay Kumar Singh**, N Kumar, and S Sriboonchitta. On constacyclic codes over $\mathbb{Z}_4[v]/\langle v^2 - v \rangle$ and their Gray images. **IEEE Communications Letters**, 22(9):1758-1761, 2018.
7. H Q Dinh, B T Nguyen, **Abhay Kumar Singh**, and S Sriboonchitta. Hamming and symbol-pair distances of repeated-root constacyclic codes of prime power lengths over $F_{pm} + uF_{pm}$. **IEEE Communications Letters**, 22(9):1758-1761, 2018.
8. P Mishra, C Bhaya, A K Pal, and **Abhay Kumar Singh**. Compressed DNA Coding using Minimum Variance Human Tree. **IEEE Communications Letters**, 24(8):1602-1606, 2020.
9. V. P Jha, U. Parampalli and **Abhay Kumar Singh**. *Stabilizer codes and Symbol-Pair Metric are Related*, **IEEE International Symposium on Information Theory (ISIT)**, pp. 2969-2973, 2022.
10. **Abhay Kumar Singh** and Narendra Kumar. *Construction of Distance-Optimal $\mathbb{Z}_4$ -Linear Codes via Cyclic Codes Over a Non-Chain Ring*, **IEEE International Symposium on Information Theory (ISIT)**, 2025 (Accepted)

B. Theoretical Computer Science

11. N Kumar, S S Bhoi, and **Abhay Kumar Singh**. A study of primer design with w-constacyclic shift over $\mathbb{F}_4$. **Theoretical Computer Science**. 960, 113925, 2023.
12. H Q Dinh, **Abhay Kumar Singh**, S. Pattanayak, and S Sriboonchitta. Construction of cyclic DNA codes over the ring $\mathbb{Z}_4[u]/\langle u^2 - 1 \rangle$ based on the deletion distance. **Theoretical Computer Science(Elsevier)**, 773:27-42, 2019.

C. Discrete Mathematics(Elsevier)

13. Pratyush Kumar, Ankur, and **Abhay Kumar Singh**. Lee metric codes for symbol-pair read channels, **Discrete Mathematics**, Volume 349, Issue 3, 2026. .

14. Hai Q Dinh, **Abhay Kumar Singh**, Pratyush Kumar, and Songsak Sriboonchitta. Cyclic codes over the ring $GR(p^e, m)[u]/\langle u^k \rangle$. **Discrete Mathematics(Elsevier)**, 343(1):111-543, 2020.
15. Hai Q Dinh, **Abhay Kumar Singh**, Pratyush Kumar, and Songsak Sriboonchitta. On the structure of cyclic codes over the ring $\mathbb{Z}_{2^s}[u]/\langle u^k \rangle$. **Discrete Mathematics(Elsevier)**, 341(8):2243-2275, 2018.

D. Designs, Codes and Cryptography(Springer)

16. Bose, M.K., Paramalli, U. & **Abhay Kumar Singh** Binary cyclic codes from permutation polynomials over $F(2)^m$. **Des. Codes Cryptogr.** 93, 3903–3932 (2025). <https://doi.org/10.1007/s10623-025-01661-5>.
17. Hai Q Dinh, **Abhay Kumar Singh**, Sukhamoy Pattanayak, and Songsak Sriboonchitta. Cyclic DNA codes over the ring $\mathbb{F}_2 + u\mathbb{F}_2 + v\mathbb{F}_2 + uv\mathbb{F}_2 + v^2\mathbb{F}_2 + uv^2\mathbb{F}_2$. **Designs, Codes and Cryptography(Springer)**, 86(7):1451-1467, 2018.
18. **Abhay Kumar Singh** and Pramod Kumar Kewat. On cyclic codes over the ring $\mathbb{Z}_p[u]/\langle u^k \rangle$. **Designs, Codes and Cryptography(Springer)**, 74(1):113, 2015.

E. Cryptography and Communications Discrete Structures, Boolean Functions and Sequences

19. S S Bhoi, U Paramapalli, and **Abhay Kumar Singh**. "Construction of Multiple Constrained DNA Codes." **Cryptography and Communications Discrete Structures, Boolean Functions and Sequences(Springer)** DOI 10.1007/s12095-024-00718-x, (2024).
20. Hai Q Dinh, Narendra Kumar and **Abhay Kumar Singh**. *Quantum Codes over non finite chain rings*, **Cryptography and Communications Discrete Structures, Boolean Functions and Sequences(Springer)**, 14, pp. 909-923, 2022.

F. Journal of Algebra and Its Applications

21. Hai Q Dinh, **Abhay Kumar Singh**, Sampurna Satpati, and Songsak Sriboonchitta. Symbol triple distance of repeated root constacyclic codes of prime power lengths. **Journal of Algebra and Its Applications(World Scientific)**, 19(11):2050209, 2020.

G. Applicable Algebra in Engineering Communication and Computing(Springer)

22. Hai Q Dinh, Narendra Kumar, **Abhay Kumar Singh**, Manoj Kumar Singh, Indivar Gupta, and Paravee Maneejuk. On the symbol-pair distance of some classes of repeated-root constacyclic codes over a Galois ring. **Applicable Algebra in Engineering Communication and Computing(Springer)**, pages 1-18, 2021.
23. Hai Q. Dinh, **Abhay Kumar Singh**, and Madhu Kant Thakur. On symbol-pair distances of repeated-root constacyclic codes of length $2p^s$ over $\mathbb{F}_{p^m} + u\mathbb{F}_{p^m}$ and MDS symbol-pair codes. **Applicable Algebra in Engineering, Communication and Computing**, 34, no. 6 (2023): 1027-1043.
24. Hai Q Dinh, A Gaur, Indivar Gupta, **Abhay Kumar Singh**, Manoj Kumar Singh, and Roengchai Tansuchat. Hamming distance of repeated-root constacyclic codes of length $2p^s$ over $\mathbb{F}_{p^m} + u\mathbb{F}_{p^m}$. **Applicable Algebra in Engineering Communication and Computing(Springer)**, 31:291-305, 2020.

H. Journal of Applied Mathematics and Computing(Springer)

25. Hai Q Dinh, **Abhay Kumar Singh**, and Madhu Kant Thakur. On Hamming and b-symbol Distance Distributions of Repeated-Root Constacyclic Codes of Length $4p^s$ over $\mathbb{F}_{p^m} + u\mathbb{F}_{p^m}$, **Journal of Applied Mathematics and Computing(Springer)**, 66(1):885-905, 2021.

26. Hai Q. Dinh, Sampurna Satpati, and **Abhay Kumar Singh**. *Construction of optimal codes from a class of constacyclic codes*, **Journal of Applied Mathematics and Computing** (2022): 1-17.

I. Advances in Mathematics of Communications

27. On symbol-pair distance distributions of repeated-root constacyclic codes of length and MDS codes Hai Q. Dinh, Abhay Kumar Singh, and Madhu Kant Thakur, **Advances in Mathematics of Communications** 2025, 19(5): 1404-1416. doi: 10.3934/amc.2025001
28. Hai Q. Dinh, Atul Gaur, Pratyush Kumar, Manoj Kumar Singh and **Abhay Kumar Singh**. *Cyclic Codes Over Rings of Matrices*, **Advances in Mathematics of Communications**, 2022. doi: 10.3934/amc.2022073.

J. Information Theory Journals

29. C Bhaya, Md Zain, and **Abhay Kumar Singh**, A DNA-based color image cryptosystem using chaotic maps, spiral mixing and non-linear binary operator, **Scientific Reports** (2025), DOI: 10.1038/s41598-025-04021-4
30. Bindal, E., Singh, **A.K.**, Singh, M.K. (2025). A Novel PQ-KEM Based on Coding Theory. **INDOCRYPT** 2024. Lecture Notes in Computer Science, vol 15496. Springer, Cham. https://doi.org/10.1007/978-3-031-80311-6_13
31. Narendra Kumar, Siddhartha Siddhiprada Bhoi, Ruchir Gupta and **Abhay Kumar Singh**. *Sliding window symbol-pair constrained codes for energy harvesting*, **Annals of Telecommunications**, 78, pp. 71-77, 2023.
32. Pooja Mishra, Chiranjeev Bhaya, Arup Kumar Pal, and **Abhay Kumar Singh**. A novel binary operator for designing medical and natural image cryptosystems. **Signal Processing: Image Communication**, 98 (2021): 116377.
33. Pooja Mishra, Chiranjeev Bhaya, Arup Kumar Pal, and **Abhay Kumar Singh**. A medical image cryptosystem using bit-level division with DNA coding. **Journal of Ambient Intelligence and Humanized Computing**(Springer), pages 122, 2021.
34. H Q Dinh, P Kumam, P Kumar, S Satpati, **Abhay Kumar Singh**, and W Yamaka. MDS Symbol-Pair Repeated-Root Constacyclic Codes of Prime Power Lengths Over $\mathbb{F}_{p^m} + u\mathbb{F}_{p^m}$. **IEEE Access**, 7:145039-145048, 2019.
35. H Q Dinh, A Gaur, **Abhay Kumar Singh**, M K Singh, and W Yamaka. b-Symbol Distance of Constacyclic Codes of Length p^s Over $\mathbb{F}_{p^m} + u\mathbb{F}_{p^m}$. **IEEE Access**, 8, 67330-67341, 2020.
36. **Abhay Kumar Singh**, Narendra Kumar, Pooja Mishra, Manoj Kumar Singh, and Indivar Gupta. Construction of dual cyclic codes over $\mathbb{F}_2[uv]/\langle u^2, v^2 - v, uv - vu \rangle$ for DNA Computation. **Defence Science Journal**, 68(5):467472, 2018.
37. H Q. Dinh, B T. Nguyen, **Abhay Kumar Singh**, W Yamaka. *MDS constacyclic codes and MDS symbol-pair constacyclic codes*, **IEEE Access**. 9, 137970-137990, 2021.
38. Bindal, Ekta, and **Abhay Kumar Singh**. Secure and Compact: A New Variant of McEliece Cryptosystem,” **IEEE Access**, vol. 12, pp. 35586-35596, 2024, doi: 10.1109/ACCESS.2024.3373314
39. **Abhay Kumar Singh**, Sukhamoy Pattanayak, Amrit Kumar Mahato, and Manoj Kumar Patel. On negacyclic codes over the ring $\mathbb{Z}_p + u\mathbb{Z}_p + \dots + u^{k+1}\mathbb{Z}_p$. **Open Physics**(De Gruyter Open), 14(1):200211, 2016.
40. **Abhay Kumar Singh** and B M Pandeya. A note on Generalization of Semi Clean Rings. **International Journal of Algebra**, 5(21):1039-1047, 2011.
41. . Shiv Kumar, **Abhay Kumar Singh**, and Samarjit Kar. A Deteriorating Inventory Model with Price Dependent Consumption Rate and Exponentially Declining Partial Backlogging. **Proceedings of the National Academy of Sciences, India Section A: Physical Sciences**(Springer), pages 18, 2018.

42. Shiv Kumar, **Abhay Kumar Singh**, and Manoj Kumar Patel. Optimization of Weibull deteriorating items inventory model under the effect of price and time dependent demand with partial backlogging. **Sadhana(Springer)**, 41(9):977984, 2016.
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44. **Abhay Kumar Singh** and Amrit Kumar Mahato. Critically Compressible Modules. **South east Asian Bulletin of Mathematics(Springer)**, 42(1), 2018.
45. Tiwary Anubhav, H Q Dinh, **Abhay K Singh**, G K Verma, and W Yamaka, Repeated-root Constacyclic AMDS and NMDS Codes in Hamming and Symbol-Pair Metric, **Mathematics** (Accepted) 2025

K. International Journal of Biomathematics(World Scientific)

46. Hai Q Dinh, **Abhay Kumar Singh**, Sukhamoy Pattanayak, and Songsak Sriboonchitta. DNA cyclic codes over the ring $\mathbb{F}_2[u]/\langle u^2, v^3 - v, uv - vu \rangle$. **International Journal of Biomathematics(World Scientific)**, 11(03):1850042, 2018.
47. Narendra Kumar and **Abhay Kumar Singh**. DNA computing over the ring $\mathbb{Z}_4[v]/\langle v^2 - v \rangle$. **International Journal of Biomathematics(World Scientific)**, 11(07):1850090, 2018.

L. Asian-European Journal of Mathematics(World Scientific)

48. **Abhay Kumar Singh**, Sukhamoy Pattanayak, Pratyush Kumar, and Kar Ping Shum. On quantum codes obtained from cyclic codes over $\mathbb{F}_2 + u\mathbb{F}_2 + u^2\mathbb{F}_2$. **Asian-European Journal of Mathematics(World Scientific)**, 11(01):1850009, 2018.
49. **Abhay Kumar Singh**, Narendra Kumar, and Kar Ping Shum. Cyclic self-orthogonal codes over finite chain ring. **Asian-European Journal of Mathematics(World Scientific)**, page 1850078, 2017.
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