1 List of references (theory)

LCS of uniform cladograms: [4, 3, 2, 14, 20, 5].

LCS of dense Erdő-Rényi random graphs: [6, 10, 24].

LCS of uniform hypergraphs: [16].

LCS of random words: [7, 8, 9, 12, 15, 18].

LCS of Mallows permutations: [13].

An extension of the uniform cladogram style LCS to leaf labelled Bienaymé trees: [21].

LCS of uniform random recursive trees: Not released yet, but try looking for [Baumler, Kerriou, Martin, Lodewijks, Powierski, Rácz and Sridhar 2025+] if some time has passed.

2 List of references (applications)

Admittedly, I know the literature for these topics way worse, but I'll at least put some stuff down to get you going if you want to dig around yourself!

Algorithmic discussions of the LCS for graphs: [1, 23, 11, 19].

Leaf labelled binary trees and the LCS appearing in phylogenetics: [22, 4].

Graph matching surveys: [17, 25]

References

[1] T. Akutsu. An rnc algorithm for finding a largest common subtree of two trees. *IEICE TRANSACTIONS on Information*, E75-D(1):95–101, January 1992.

[2] D. J. Aldous. On the largest common subtree of random leaf-labeled binary trees. *SIAM Journal on Discrete Mathematics*, 36(1):299–314, 2022.

[3] D. I. Bernstein, L. S. Tung Ho, C. Long, M. Steel, K. S. John, and S. Sullivant. Bounds on the expected size of the maximum agreement subtree. *SIAM Journal on Discrete Mathematics*, 29(4):2065–2074, 2015.

[4] D. Bryant, A. McKenzie, and M. Steel. The size of a maximum agreement subtree for random binary trees. In *Bioconsensus (Piscataway, NJ,*

2000/2001), volume 61 of *DIMACS Ser. Discrete Math. Theoret. Comput. Sci.*, pages 55–65. Amer. Math. Soc., Providence, RI, 2003.

[5] T. Budzinski and D. Sénizergues. Maximum agreement subtrees and Hölder homeomorphisms between Brownian trees. *arXiv preprint arXiv:2304.00905*, 2023.

[6] S. Chatterjee and P. Diaconis. Isomorphisms between random graphs. *Journal of Combinatorial Theory, Series B*, 160:144–162, 2023.

[7] V. Chvatal and D. Sankoff. Longest common subsequences of two random sequences. *J. Appl. Probability*, 12:306–315, 1975.

[8] V. Dančík and M. Paterson. Upper bounds for the expected length of a longest common subsequence of two binary sequences. *Random Structures Algorithms*, 6(4):449–458, 1995.

[9] J. G. Deken. Some limit results for longest common subsequences. *Discrete Math.*, 26(1):17–31, 1979.

[10] D. Diamantidis, T. Konstantopoulos, and L. Yuan. A combinatorial approach to phase transitions in random graph isomorphism problems. *arXiv preprint arXiv:2410.00214*, 2024.

[11] H.-C. Ehrlich and M. Rarey. Maximum common subgraph isomorphism algorithms and their applications in molecular science: a review. *Wiley Interdisciplinary Reviews: Computational Molecular Science*, 1(1):68–79, 2011.

[12] C. Houdré and U. I̧slak. A central limit theorem for the length of the longest common subsequences in random words. *Electron. J. Probab.*, 28:Paper No. 3, 24, 2023.

[13] K. Jin. The length of the longest common subsequence of two independent Mallows permutations. *Ann. Appl. Probab.*, 29(3):1311–1355, 2019.

[14] A. Khezeli. An improved lower bound on the largest common subtree of random leaf-labeled binary trees. *SIAM Journal on Discrete Mathematics*, 38(3):2530–2541, 2024.

[15] M. Kiwi, M. Loebl, and J. Matoušek. Expected length of the longest common subsequence for large alphabets. *Advances in Mathematics*, 197(2):480–498, 2005.

[16] T. Lenoir. Isomorphisms between random d-hypergraphs. *arXiv preprint arXiv:2405.04670*, 2024.

[17] L. Livi and A. Rizzi. The graph matching problem. *Pattern Analysis and Applications*, 16(3):253–283, 2013.

[18] G. S. Lueker. Improved bounds on the average length of longest common subsequences. *J. ACM*, 56(3):Art. 17, 38, 2009.

[19] C. McCreesh, P. Prosser, C. Solnon, and J. Trimble. When subgraph isomorphism is really hard, and why this matters for graph databases. *Journal of Artificial Intelligence Research*, 61:723–759, 2018.

[20] P. Misra and S. Sullivant. Bounds on the expected size of the maximum agreement subtree for a given tree shape. *SIAM Journal on Discrete Mathematics*, 33(4):2316–2325, 2019.

[21] B. Pittel. Expected number of induced subtrees shared by two independent copies of a random tree. *SIAM Journal on Discrete Mathematics*, 37(1):1–16, 2023.

[22] C. Semple, M. Steel, et al. *Phylogenetics*, volume 24. Oxford University Press on Demand, 2003.

[23] R. Shamir and D. Tsur. Faster subtree isomorphism. *Journal of Algorithms*, 33(2):267–280, 1999.

[24] E. Surya, L. Warnke, and E. Zhu. Isomorphisms between dense random graphs. *Combinatorica*, 45(4):35, 2025.

[25] J. Yan, X.-C. Yin, W. Lin, C. Deng, H. Zha, and X. Yang. A short survey of recent advances in graph matching. In *Proceedings of the 2016 ACM on international conference on multimedia retrieval*, pages 167–174, 2016.