

# List of Publications

Johannes Lengler, ETH Zürich

I have published in three scientific communities, each of which comes with its own publication culture. **Papers in which authors are sorted by contribution are marked with \***. Publication that are important for the proposal are marked in bold.

- In **mathematics**, authors are sorted *alphabetically*, and papers are published in *journals*.
- In **theoretical computer science**, authors are sorted *alphabetically*, and *conference proceedings* are the most important publication venues. If a paper contains more material than can be published in the proceedings, then additionally a journal version is published separately, often with the same title.
- In **computational neuroscience**, authors are sorted *by contribution*, and papers are published in *journals*.

## Peer-Reviewed Book Chapters

- J. Lengler. Drift analysis. *Book Chapter in: Theory of Evolutionary Computation: Recent Developments in Discrete Optimization*, pages 89–131, 2020, Springer
- \*• J. Lengler and A. Steger. Randomness as a building block for reproducibility in local cortical networks. *Book chapter in: Reproducibility: Principles, Problems, Practices, and Prospects*, pages 325–340, 2016, Wiley

## Journals

- J. Lengler and J. Meier. Large population sizes and crossover help in dynamic environments. *Natural Computing*, pages 1–15, 2022
- J. Lengler and S. Riedi. Runtime analysis of the  $(\mu + 1)$ -EA on the dynamic BinVal function. *SN Computer Science*, 3:1–18, 2022
- K. Bringmann, R. Keusch, J. Lengler, Y. Maus, and A. R. Molla. Greedy routing and the algorithmic small-world phenomenon. *Journal of Computer and System Sciences*, 125:59–105, 2022
- J. Komjáthy, J. Lapinskas, and J. Lengler. Penalising transmission to hubs in scale-free spatial random graphs. In *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques*, volume 57, pages 1968–2016. Institut Henri Poincaré, 2021
- B. Doerr, C. Doerr, and J. Lengler. Self-adjusting mutation rates with provably optimal success rules. *Algorithmica*, 83(10):3108–3147, 2021
- J. Lengler and X. Zou. Exponential slowdown for larger populations: The  $(\mu + 1)$ -EA on monotone functions. *Theoretical Computer Science*, 875:28–51, 2021
- J. Lengler, D. Sudholt, and C. Witt. The complex parameter landscape of the compact genetic algorithm. *Algorithmica*, 83(4):1096–1137, 2021

- C. Koch and J. Lengler. Bootstrap percolation on geometric inhomogeneous random graphs. *Internet Mathematics*, page 18995, 2021
- K. L. Clarkson, B. Gärtner, J. Lengler, and M. Szedlák. Random sampling with removal. *Discrete & Computational Geometry*, 64(3):700–733, 2020
- B. Doerr, T. Kötzing, J. G. Lagodzinski, and J. Lengler. The impact of lexicographic parsimony pressure for order/majority on the run time. *Theoretical Computer Science*, 816:144–168, 2020
- T. Kötzing, J. G. Lagodzinski, J. Lengler, and A. Melnichenko. Destructiveness of lexicographic parsimony pressure and alleviation by a concatenation crossover in genetic programming. *Theoretical Computer Science*, 816:96–113, 2020
- H. Einarsson, J. Lengler, F. Mousset, K. Panagiotou, and A. Steger. Bootstrap percolation with inhibition. *Random Structures & Algorithms*, 55(4):881–925, 2019
- K. Bringmann, R. Keusch, and J. Lengler. Geometric inhomogeneous random graphs. *Theoretical Computer Science*, 2019
- J. Lengler. A general dichotomy of evolutionary algorithms on monotone functions. *IEEE Transactions on Evolutionary Computation*, 2019
- L. A. Goldberg, J. Lapinskas, J. Lengler, F. Meier, K. Panagiotou, and P. Pfister. Asymptotically optimal amplifiers for the Moran process. *Theoretical Computer Science*, 2019
- H. Einarsson, M. M. Gaury, J. Lengler, F. Meier, A. Mujika, A. Steger, and F. Weissenberger. The linear hidden subset problem for the (1+1) EA with scheduled and adaptive mutation rates. *Theoretical Computer Science*, 2019
- T. Gavenciak, B. Geissmann, and J. Lengler. Sorting by swaps with noisy comparisons. *Algorithmica*, 80(11):1–32, 2019
- \*• F. Weissenberger, H. Einarsson, M. Gaury, F. Meier, A. Mujika, J. Lengler, and A. Steger. On the origin of lognormal network synchrony in CA1. *Hippocampus*, 2018
- J. Lengler and A. Steger. Drift analysis and evolutionary algorithms revisited. *Combinatorics, Probability and Computing*, 27(4):643–666, 2018
- C. Doerr and J. Lengler. The (1+1) elitist black-box complexity of LeadingOnes. *Algorithmica*, 80(5):1579–1603, 2018
- \*• F. Weissenberger, M. M. Gaury, J. Lengler, F. Meier, and A. Steger. Voltage dependence of synaptic plasticity is essential for rate based learning with short stimuli. *Scientific Reports*, 8(1):4609, 2018
- \*• M. Matheus Gaury, J. Lengler, H. Einarsson, F. Meier, F. Weissenberger, M. F. Yanik, and A. Steger. A hippocampal model for behavioral time acquisition and fast bidirectional replay of spatio-temporal memory sequences. *Frontiers in neuroscience*, 2018
- \*• F. Weissenberger, F. Meier, J. Lengler, H. Einarsson, and A. Steger. Long synfire chains emerge by spike-timing dependent plasticity modulated by population activity. *International Journal of Neural Systems*, 27(08):1750044, 2017
- C. Doerr and J. Lengler. Introducing elitist black-box models: When does elitist behavior weaken the performance of evolutionary algorithms? *Evolutionary Computation*, 25(4):587–606, 2017

- \*• J. Lengler and A. Steger. Note on the coefficient of variations of neuronal spike trains. *Biological cybernetics*, 111(3-4):229–235, 2017
- C. Doerr and J. Lengler. Onemax in black-box models with several restrictions. *Algorithmica*, 78(2):610–640, 2017
- \*• H. Einarsson, M. M. Gauy, J. Lengler, and A. Steger. A model of fast hebbian spike latency normalization. *Frontiers in Computational Neuroscience*, 11:33, 2017
- H. Einarsson, J. Lengler, F. Mousset, K. Panagiotou, and A. Steger. Connectivity thresholds for bounded size rules. *The Annals of Applied Probability*, 26(5):3206–3250, 2016
- \*• H. Einarsson, J. Lengler, and A. Steger. A high-capacity model for one shot association learning in the brain. *Frontiers in Computational Neuroscience*, 8:140, 2014
- D. Johannsen, P. P. Kurur, and J. Lengler. Evolutionary algorithms for quantum computers. *Algorithmica*, 68(1):152–189, 2014
- \*• J. Lengler, F. Jug, and A. Steger. Reliable neuronal systems: the importance of heterogeneity. *PloS One*, 8(12):e80694, 2013
- B. Doerr, T. Kötzing, J. Lengler, and C. Winzen. Black-box complexities of combinatorial problems. *Theoretical Computer Science*, 471:84–106, 2013
- J. Lengler. The global Cohen–Lenstra heuristic. *Journal of Algebra*, 357:347–369, 2012
- J. Lengler and B. Mehnert. Matrix theory. In *Advances in Mathematics Research*. 15, pages 273–300. Nova Science Publishers, 2012
- J. Lengler. The Cohen–Lenstra heuristic: methodology and results. *Journal of Algebra*, 323(10):2960–2976, 2010
- J. Lengler. A combinatorial interpretation of the probabilities of p-groups in the Cohen–Lenstra measure. *Journal of Number Theory*, 128(7):2070–2084, 2008
- B. Doerr, J. Lengler, and D. Steurer. The interval liar game. *Electronic Notes in Discrete Mathematics*, 28:425–432, 2007

## Refereed Proceedings

- M. Kaufmann, M. Larcher, J. Lengler, and X. Zou. Self-adjusting population sizes for the  $(1, \lambda)$ -EA on monotone functions. In *Parallel Problem Solving From Nature*. Springer, 2022
- D. Janett and J. Lengler. Two-dimensional drift analysis: Optimizing two functions simultaneously can be hard. In *Parallel Problem Solving From Nature*. Springer, 2022
- \*• T. Helmuth, J. Lengler, and W. La Cava. Population diversity leads to short running times of lexibase selection. In *Parallel Problem Solving From Nature*. Springer, 2022
- J. Lengler and S. Riedi. Runtime Analysis of the  $(\mu + 1)$ -EA on the Dynamic BinVal Function. In *Evolutionary Computation in Combinatorial Optimization*, pages 84–99. Springer, 2021
- J. Lengler and J. Meier. Large population sizes and crossover help in dynamic environments. In *Parallel Problem Solving from Nature*, pages 610–622. Springer, 2020

- D. Bertschinger, J. Lengler, A. Martinsson, R. Meier, A. Steger, M. Trujić, and E. Welzl. An optimal decentralized  $(\delta + 1)$ -coloring algorithm. In *European Symposium on Algorithms*. Schloss Dagstuhl-Leibniz-Zentrum für Informatik, 2020
- J. Lengler, A. Martinsson, and A. Steger. When does hillclimbing fail on monotone functions: An entropy compression argument. In *Analytic Algorithmics and Combinatorics*, pages 94–102. SIAM, 2019
- C. Knierim, J. Lengler, P. Pfister, U. Schaller, and A. Steger. The maximum label propagation algorithm on sparse random graphs. In *Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques, APPROX/RANDOM*, pages 58:1–58:15. Leibniz International Proceedings in Informatics LIPIcs, 2019
- J. Lengler and X. Zou. Exponential slowdown for larger populations: the  $(\mu + 1)$ -EA on monotone functions. In *Foundations of Genetic Algorithms*, pages 87–101. ACM, 2019
- B. Doerr, C. Doerr, and J. Lengler. Self-adjusting mutation rates with provably optimal success rules. In *Genetic and Evolutionary Computation Conference*, pages 1479–1487. ACM, 2019
- M. Ghaffari and J. Lengler. Nearly-tight analysis for 2-choice and 3-majority consensus dynamics. In *ACM Symposium on Principles of Distributed Computing*, pages 305–313. ACM, 2018
- H. Einarsson, J. Lengler, M. M. Gauy, F. Meier, A. Mujika, A. Steger, and F. Weissenberger. The linear hidden subset problem for the  $(1+1)$  EA with scheduled and adaptive mutation rates. In *Genetic and Evolutionary Computation Conference*, pages 1491–1498. ACM, 2018
- J. Lengler, D. Sudholt, and C. Witt. Medium step sizes are harmful for the compact genetic algorithm. In *Genetic and Evolutionary Computation Conference*, pages 1499–1506. ACM, 2018
- J. Lengler. A general dichotomy of evolutionary algorithms on monotone functions. In *Parallel Problem Solving From Nature*, pages 3–15. Springer, 2018
- T. Kötzing, J. A. G. Lagodzinski, J. Lengler, and A. Melnichenko. Destructiveness of lexicographic parsimony pressure and alleviation by a concatenation crossover in genetic programming. In *Parallel Problem Solving From Nature*, pages 42–54. Springer, 2018
- J. Lengler and U. Schaller. The  $(1+1)$ -EA on noisy linear functions with random positive weights. In *Foundations of Computational Intelligence*. Springer, 2018
- K. Bringmann, R. Keusch, J. Lengler, Y. Maus, and A. R. Molla. Greedy routing and the algorithmic small-world phenomenon. In *Principles of Distributed Computing*, pages 371–380. ACM, 2017
- B. Doerr, T. Kötzing, J. Lagodzinski, and J. Lengler. Bounding bloat in genetic programming. In *Genetic and Evolutionary Computation Conference*, pages 921–928. ACM, 2017
- T. Gavenciak, B. Geissmann, and J. Lengler. Sorting by swaps with noisy comparisons. In *Genetic and Evolutionary Computation Conference*, pages 1375–1382. ACM, 2017
- K. Bringmann, R. Keusch, and J. Lengler. Sampling geometric inhomogeneous random graphs in linear time. In *European Symposium on Algorithms*, volume 87 of *LIPIcs*, pages

20:1–20:15. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2017

- C. Doerr and J. Lengler. The  $(1+1)$  elitist black-box complexity of LeadingOnes is  $\Theta(n^2)$ . In *Genetic and Evolutionary Computation Conference*, pages 1131–1138. ACM, 2016
- B. Gärtner, J. Lengler, and M. Szedlák. Random sampling with removal. In *Symposium on Computational Geometry*, volume 51 of *LIPICs*, pages 40:1–40:16. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2016
- C. Koch and J. Lengler. Bootstrap percolation on geometric inhomogeneous random graphs. In *International Colloquium on Automata, Languages, and Programming*, volume 55, pages 147:1–147:15. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2016
- C. Doerr and J. Lengler. OneMax in black-box models with several restrictions. In *Genetic and Evolutionary Computation Conference*, pages 1431–1438. ACM, 2015
- C. Doerr and J. Lengler. Elitist black-box models: Analyzing the impact of elitist selection on the performance of evolutionary algorithms. In *Genetic and Evolutionary Computation Conference*, pages 839–846. ACM, 2015
- A. Karbasi, J. Lengler, and A. Steger. Normalization phenomena in asynchronous networks. In *International Colloquium on Automata, Languages, and Programming*, pages 688–700. Springer, 2015
- J. Lengler and N. Spooner. Fixed budget performance of the  $(1+1)$  ea on linear functions. In *Foundations of Genetic Algorithms*, pages 52–61. ACM, 2015
- B. Doerr, J. Lengler, T. Kötzing, and C. Winzen. Black-box complexities of combinatorial problems. In *Genetic and Evolutionary Computation Conference*, pages 981–988. ACM, 2011
- D. Johannsen, P. P. Kurur, and J. Lengler. Can quantum search accelerate evolutionary algorithms? In *Genetic and Evolutionary Computation Conference*, pages 1433–1440. ACM, 2010
- B. Doerr, J. Lengler, and D. Steurer. The interval liar game. In *International Symposium on Algorithms and Computation*, pages 318–327. Springer, 2006