CHRISTIAN ENGELS

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GENERAL INFORMATION

- Date of Birth: 13.08.1985.
- Nationality: German.
- Fluent in: German, English.

EDUCATION AND EMPLOYMENT

PostDoc
National Institute of Informatics (Big Data Mathematics Project)
2019.10 - Tokyo, Japan

PostDoc
Indian Institute of Technology Bombay
2017.08 - 2019.09 Mumbai, India

PostDoc
Kyoto University
2017.04 - 2017.09 Kyoto, Japan

PostDoc
Tokyo Institute of Technology (Exploring the Limits of Computation Project)
2015.11 - 2017.03 Tokyo, Japan

PhD. in Computer Science **Thesis:** Why are certain polynomials hard? **Advisor:** Prof. Markus Blaeser
Saarland University
2010.07 - 2015.11 Saarbruecken, Germany

MSc. In Computer Science **Thesis:** Randomness Efficient Identity Testing s. **Advisor:** Prof. Markus Blaeser
Saarland University
2008 - 2010 Saarbruecken, Germany

BSc. in Computer Science **Thesis:** Probabilistic Analysis of Algorithms for the TSP. **Advisor:** Dr. Bodo Manthey
Saarland University
2005 - 2008 Saarbruecken, Germany

TEACHING EXPERIENCE

- Teaching Assistant for “Algorithms and Datastructures”.
- Teaching Assistant for “Complexity Theory”.
- Teaching Assistant for “Introduction to Theoretical Computer Science”.

REVIEWER FOR

- Discreet Applied Mathematics (DAM).
- Theory of Computing Systems (TCS).
- International Symposium on Algorithms and Computing (ISAAC).
- Workshop on Approximation and Online Algorithms (WAOA).
- International Conference on Algorithms and Complexity (CIAC).
- Symposium on Foundations of Computer Science (FOCS).

- Symposium on Theory of Computing (STOC).

REFERENCES

- Raghavendra Rao B. V., bvrr@cse.iitm.ac.in, Indian Institute of Technology Madras, Chennai, India.
- Kazuhisa Makino, makino@kurims.kyoto-u.ac.jp, Research Institute for Mathematical Sciences, Kyoto, Japan.
- Markus Blaeser, mblaeser@cs.uni-saarland.de, Saarland University, Germany.

IMPORTANT PUBLICATIONS

- [10], "A Near-Optimal Depth-Hierarchy Theorem for Small-Depth Multilinear Circuits", https://eccc.weizmann.ac.il/report/2018/062/
- [3], "On Expressing Majority as a Majority of Majorities", https://eccc.weizmann.ac.il/report/2017/174
- [4], "On hard instances of non-commutative permanent", https://doi.org/10.1016/j.dam.2019.09.003
- [9], "Parameterized Valiant's Classes", https://narfinger.github.io/publication/2019-ipec/2019-ipec.pdf

PUBLICATIONS

Unpublished or Preprint

[1] Banerjee, N., **Engels, C.**, Hoang, D. A., "Distance Recoloring". In: *CoRR* abs/2402.12705 (2024).

[2] Chakraborty, S., **Engels, C.**, Jo, S., Liu, M., "Cell-Probe Lower Bound for Accessible Interval Graphs". In: *CoRR* abs/2311.028 (2023). DOI: 10.48550/ARXIV.2311.02839. URL: https://doi.org/10.48550/arXiv.2311.02839.

Journal Articles

[3] **Engels, C.**, Garg, M., Makino, K., Rao, A., "On Expressing Majority as a Majority of Majorities". In: *SIAM J. Discret. Math.* 34.1 (2020), pp. 730–741. DOI: 10.1137/18M1223599. URL: https://doi.org/10.1137/18M1223599.

[4] **Engels, C.**, Rao, B. V. R., "On hard instances of non-commutative permanent". In: *Discret. Appl. Math.* 277 (2020), pp. 127–138. DOI: 10.1016/j.dam.2019.09.003. URL: https://doi.org/10.1016/j.dam.2019.09.003.

[5] **Engels, C.** "Dichotomy Theorems for Homomorphism Polynomials of Graph Classes". In: *J. Graph Algorithms Appl.* 20.1 (2016), pp. 3–22. DOI: 10.7155/jgaa.00382. URL: https://doi.org/10.7155/jgaa.00382.

[6] Bringmann, K., **Engels, C.**, Manthey, B., Rao, B. V. R., "Random Shortest Paths: Non-Euclidean Instances for Metric Optimization Problems". In: *Algorithmica* 73.1 (2015), pp. 42–62. DOI: 10.1007/s00453-014-9901-9. URL: https://doi.org/10.1007/s00453-014-9901-9.

[7] **Engels, C.**, Manthey, B., "Average-case approximation ratio of the 2-opt algorithm for the TSP". In: *Oper. Res. Lett.* 37.2 (2009), pp. 83–84. DOI: 10.1016/j.orl.2008.12.002. URL: https://doi.org/10.1016/j.orl.2008.12.002.

Conference Proceedings

[8] Chakraborty, S., **Engels, C.**, "Lower Bounds for Lexicographical DFS Data Structures". In: *Data Compression Conference, DCC 2022, Snowbird, UT, USA, March 22-25, 2022*. 2022, p. 449. DOI: 10.1109/DCC52660.2022.00060. URL: https://doi.org/10.1109/DCC52660.2022.00060.

[9] Bläser, M., **Engels, C.**, "Parameterized Valiant's Classes". In: *14th International Symposium on Parameterized and Exact Computation, IPEC 2019, September 11-13, 2019, Munich, Germany*. Vol. 148. LIPIcs. 2019, 3:1–3:14. DOI: 10.4230/LIPIcs.IPEC.2019.3. URL: https://doi.org/10.4230/LIPIcs.IPEC.2019.3.

[10] Chillara, S., **Engels, C.**, Limaye, N., Srinivasan, S., "A Near-Optimal Depth-Hierarchy Theorem for Small-Depth Multilinear Circuits". In: *59th IEEE Annual Symposium on Foundations of Computer Science, FOCS 2018, Paris, France, October 7-9, 2018*. 2018, pp. 934–945. DOI: 10.1109/FOCS.2018.00092. URL: https://doi.org/10.1109/FOCS.2018.00092.

[11] **Engels, C.**, Rao, B. V. R., Karteek, S., "On \varSigma \wedge \varSigma \wedge \varSigma Circuits: The Role of Middle \varSigma Fan-In, Homogeneity and Bottom Degree". In: *Fundamentals of Computation Theory - 21st International Symposium, FCT 2017, Bordeaux, France, September 11-13, 2017, Proceedings*. Vol. 10472. Lecture Notes in Computer Science. 2017, pp. 230–242. DOI: 10.1007/978-3-662-55751-8_19. URL: https://doi.org/10.1007/978-3-662-55751-8%5C_19.

[12] **Engels, C.**, Rao, B. V. R., “On Hard Instances of Non-Commutative Permanent”. In: *Computing and Combinatorics - 22nd International Conference, COCOON 2016, Ho Chi Minh City, Vietnam, August 2-4, 2016, Proceedings*. Vol. 9797. Lecture Notes in Computer Science. 2016, pp. 171–181. DOI: 10.1007/978-3-319-42634-1_14. URL: https://doi.org/10.1007/978-3-319-42634-1%5C_14.

[13] **Engels, C.** “Dichotomy Theorems for Homomorphism Polynomials of Graph Classes”. In: *WALCOM: Algorithms and Computation - 9th International Workshop, WALCOM 2015, Dhaka, Bangladesh, February 26-28, 2015. Proceedings*. Vol. 8973. Lecture Notes in Computer Science. 2015, pp. 282–293. DOI: 10.1007/978-3-319-15612-5_25. URL: https://doi.org/10.1007/978-3-319-15612-5%5C_25.

[14] Bringmann, K., **Engels, C.**, Manthey, B., Rao, B. V. R., “Random Shortest Paths: Non-euclidean Instances for Metric Optimization Problems”. In: *Mathematical Foundations of Computer Science 2013 - 38th International Symposium, MFCS 2013, Klosterneuburg, Austria, August 26-30, 2013. Proceedings*. Vol. 8087. Lecture Notes in Computer Science. 2013, pp. 219–230. DOI: 10.1007/978-3-642-40313-2_21. URL: https://doi.org/10.1007/978-3-642-40313-2%5C_21.

[15] **Engels, C.**, Manthey, B., Rao, B. V. R., “Random Shortest Path Metrics with Applications”. In: *11th Cologne-Twente Workshop on Graphs and Combinatorial Optimization, Munich, Germany, May 29-31, 2012. Extended Abstracts*. 2012, pp. 121–124.

[16] Bläser, M., **Engels, C.,** “Randomness Efficient Testing of Sparse Black Box Identities of Unbounded Degree over the Reals”. In: *28th International Symposium on Theoretical Aspects of Computer Science, STACS 2011, March 10-12, 2011, Dortmund, Germany*. Vol. 9. LIPIcs. 2011, pp. 555–566. DOI: 10.4230/LIPIcs.STACS.2011.555. URL: https://doi.org/10.4230/LIPIcs.STACS.2011.555.