Per Kristian Lehre

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PERSONAL	Born on January 19th, 1977 in Oslo. Norwegian citizen. Married. No children.
RESEARCH INTERESTS	Intersection of artificial intelligence and theoretical computer science Time-complexity analysis of evolutionary algorithms Algorithmic game theory, in particular co-evolutionary dynamics Evolutionary biology and population genetics Search-based software engineering
ACADEMIC POSITIONS	◇ **School of Computer Science, University of Birmingham**, Birmingham, UK. Professor, (August 2022-) ◇ **School of Computer Science, University of Birmingham**, Birmingham, UK. Senior Lecturer (Associate Professor), (January 2017-August 2022) ◇ **School of Computer Science, University of Nottingham**, Nottingham, UK. Assistant Professor (September 2011-January 2017) ◇ **DTU Informatics, Technical University of Denmark**, Copenhagen, Denmark. Post.doc. (April 2010-September 2011). Funded by Deutsche Forschungsgemeinschaft (DFG). ◇ **School of Computer Science, University of Birmingham**, Birmingham, UK. Research Fellow (January 2007-April 2010). Funded by EPSRC project SEBASE: Software engineering By Automated SEarch. ◇ **Norwegian University of Science and Technology**, Trondheim, Norway. Lecturer (September-December 2006).
EDUCATION	◇ **Norwegian University of Science and Technology**, Trondheim, Norway. PhD in Computer Science (2001-2006). Thesis Title: *Complexity and Geometry in Artificial Development.* Thesis Advisor: Prof. Pauline C. Haddow. ◇ **Norwegian University of Science and Technology**, Trondheim, Norway. Sivilingeniør (MSc.) in Computer Science, (1997-2004). Diploma thesis: *Complexity Issues in Artificial Development.* ◇ **Université Paris 1 - Panthéon Sorbonne**, Paris, France. Erasmus exchange student (2000-2001).
FUNDING	◇ Turing AI Acceleration Fellowship, **£1.26M**, "*Rigorous time-complexity analysis of co-evolutionary algorithms*", (2021-2025), UKRI EP/V025562/1 ◇ PI and coordinator of the EU FP7 FET Open Young Explorers, **€1.578M** grant "*Speed of Adaptation in Population Genetics and Evolutionary Computation (SAGE)*", with IST Austria, Friedrich-Schiller-Universität Jena, and University of Sheffield (January 2013-December 2016). Proposal acceptance rate: 3.1 %.

Awards & Honours

- Best Paper Award of 25th International Symposium on Algorithms and Computation (ISAAC 2014)
- Best Paper Award in Evolutionary Combinatorial Optimization and Metaheuristics track (GECCO 2013)
- Honorary Research Fellow, University of Birmingham, UK (2010).
- Best Paper Award in Theory track (GECCO 2010)
- Best Paper Award in Theory track (GECCO 2009)
- Best PhD student Paper Award (with Arcuri) (ICSTW 2008)
- Best Paper Award in EMO track (GECCO 2006)

Invited and Plenary Talks

- Invited talk, University of Adelaide, Adelaide, Australia (July 2024)
- Tutorial on Runtime analysis of Population-based Evolutionary Algorithms (GECCO), Melbourne, Australia (July 2024)
- Schloss Dagstuhl Seminar talk on the SLO Hierarchy and Runtime of Evolutionary Algorithms, Dagstuhl, Germany (July 2024)
- Tutorial on Co-Evolutionay Algorithms, IEEE Conference on Evolutionary Computation (CEC), Yokohama, Japan (July 2024)
- Invited talk on Co-evolution, University of Tsukuba, Tsukuba, Japan (June 2024)
- Invited talk on Co-evolution, University of Tsinghua, Beijing, China (June 2024)
- Invited talk on Co-evolution, SuSTech, Shenzhen, China (April 2024)
- Invited talk on Co-evolution, University of Nanjing, Nanjing, China (April 2024)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms (GECCO), Lisbon, Portugal, (July 2023)
- Invited talk at University of Oslo, Norway (January 2023)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms (PPSN), Dortmund, Germany, (September 2022)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms (GECCO), Boston, USA (July 2022)
- Tutorial on Runtime Analysis of Evolutionary Algorithms: Basic Introduction (GECCO), virtual (July 2021)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms, at Genetic and Evolutionary Computation Conference (GECCO), virtual (July 2020)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms, at Parallel Problem Solving from Nature (PPSN), virtual (September 2020), Leiden, Netherlands (hybrid),
- Tutorial on Runtime Analysis of Evolutionary Algorithms: Basic Introduction, at Genetic and Evolutionary Computation Conference (GECCO), Prague, Czech Republic (July 2019)
- Evolution of Mutation Rates, A Computer Science Perspective on Evolution, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India (January 2019)
- Keynote at Optimization Problems and Their Applications (OPTA-2018), Omsk, Russia (July 2018)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms, at Parallel Problem Solving from Nature (PPSN), Coimbra, Portugal (September 2018)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms, at Genetic and Evolutionary Computation Conference (GECCO), Kyoto, Japan (July 2018)
- Tutorial on Evolutionary Computation, National Taught Courses in Operational Research (NATCOR), Nottingham, UK (April 2018)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms, at Genetic and Evolutionary Computation Conference (GECCO), Berlin, Germany (July 2017)
- Runtime Analysis Evolutionary Algorithms with Self-adaptive Mutation Rates, Dagstuhl Theory of Randomized Optimization Heuristics Seminar, Wadern, Germany (May 2017)
- Level-based Analysis of Estimation of Distribution Algorithms, Aberdeen, UK (October 2017)
- Tutorial on Runtime Analysis of Evolutionary Algorithms: Basic Introduction at International Conference on Parallel Problem Solving from Nature (PPSN), Edinburgh, UK (September 2016)
- Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms at Genetic and Evolutionary Computation Conference (GECCO), Denver, Colorado, USA. (July 2016).

- ◇ Tutorial on Evolutionary Algorithms, NATCOR, Nottingham (April 2015)
- ◇ Computer Science Seminar, University of Leicester (November 2015)
- ◇ Dagstuhl EC Theory Seminar, Wadern, Germany (May 2015)
- ◇ IEEE Computational Intelligence Society Webinar (September 2015)
- ◇ Tutorial on Runtime Analysis of Evolutionary Algorithms; Basic Introduction at Genetic and Evolutionary Computation Conference (GECCO), Madrid, Spain (July 2015)
- ◇ Tutorial on Runtime Analysis of Population-based Evolutionary Algorithms (CEC), Sendai, Japan (May 2015)
- ◇ Mittagsseminar, Institute of Theoretical Computer Science, ETH, Zürich, Switzerland (April 2015)
- ◇ Tutorial on Drift Analysis at the 7th Workshop on Theory of Randomised Search Heuristics (ThRaSH), Aberystwyth, Wales (September 2013).
- ◇ Schloss Dagstuhl Seminar on Theory of Evolutionary Algorithms, Germany (July, 2013)
- ◇ Tutorial on Runtime Analysis of Evolutionary Algorithms: Basic Introduction at Genetic and Evolutionary Computation Conference (GECCO), Amsterdam, Netherlands (July 2013).
- ◇ Tutorial on Drift Analysis at IEEE Congress on Evolutionary Computation (CEC), Cancun, Mexico (June 2013).
- ◇ Tutorial on Drift Analysis at Genetic and Evolutionary Computation Conference (GECCO), Philadelphia, USA (July 2012).
- ◇ Operational Research and Statistics Seminar, Cardiff School of Mathematics, Cardiff, UK, (March 2012).
- ◇ Tutorial on Evolutionary Algorithms and Computational Complexity at the Summer School on Artificial Evolution in Calais, France, (June 2011).
- ◇ Schloss Dagstuhl Seminar on Artificial Immune Systems, Germany (April, 2011).
- ◇ Algorithmic Intelligence Talks, IT University of Copenhagen, Denmark (March, 2011).
- ◇ Schloss Dagstuhl Seminar on Theory of Evolutionary Algorithms, Germany (September, 2010).
- ◇ Tutorial on Evolutionary Computation at the 9th Estonian Summer School in Computer and Systems Science (ESSCaSS 2010) Pedase, Estonia, (August 2010).
- ◇ Tutorial on Evolutionary Algorithms and Computational Complexity at the Summer School on Artificial Evolution in Calais, France, (June 2010).
- ◇ Computational Intelligence Seminar, School of Computing, University of Kent, UK (February 2010).
- ◇ Mittagsseminar, Institute of Theoretical Computer Science, Department of Computer Science, ETH Zürich, Switzerland (September 2009).
- ◇ Computational complexity and Evolutionary Computation. Tutorial at summer school Ecole d'été Evolution Artificielle 2009, l'île de Porquerolles, France (June 2009).
- ◇ Schloss Dagstuhl Seminar on Evolutionary Test Generation, Germany (August, 2008).
- ◇ The 2008 International Workshop on Nature Inspired Computation and Application, Hefei, China (May 2008).

Research Visits

- ◇ MIT CSAIL, USA, Hosted by Dr Una-May O'Reilly (July 2023)
- ◇ HPI Potsdam, Germany. Hosted by Prof Friedrich (September 2016)
- ◇ IST Austria, Nick Barton lab. Hosted by Dr Paixao (May 2016)
- ◇ ETH Zürich, Switzerland. Hosted by Prof Johannes Lengler (April 2015)
- ◇ IST Austria, Nick Barton lab. Hosted by Dr Paixao (Sept 2014)
- ◇ Max-Planck Institute für Informatik, Department 1: Algorithms and Complexity, Saarbrücken, Germany. Hosted by Prof. Benjamin Doerr (May-July 2010).
- ◇ Max-Planck Institute für Informatik, Department 1: Algorithms and Complexity, Saarbrücken, Germany. Hosted by Dr. Frank Neumann (November 2009).
- ◇ Lehrstuhl Informatik 2, Universität Dortmund, Germany
  Hosted by Prof Dr Ingo Wegener (September 2005 – February 2006).

Editorial and Other Work

- ◇ Associate editor, IEEE Transactions on Evolutionary Computation, (2017-2022) (completed 5 year term)
- ◇ Editorial board member of Evolutionary Computation (MIT Press), (2012-)

- ◇ Guest editor (with Chao and Neumann) for special issue of Theoretical Computer Science (2021)
- ◇ Guest editor (with Lengler) for special issue of Algorithmica on GECCO theory track. (2019)
- ◇ Guest editor (with Auger) for special issue of Algorithmica on GECCO 2018 theory track. (2018)
- ◇ Guest editor (with Haddow, Neumann, and Doerr) for special issue of IEEE Transactions on Evolutionary Computation on Theoretical Foundations of Evolutionary Computation (2013)
- ◇ Guest editor (with Xin Yao, Jon Rowe and Frank Neumann) for a special issue of Theoretical Computer Science (Elsevier) on Theoretical Foundations of Evolutionary Computation. (2012)

Reviewing

- ◇ Book chapters: "Theory of Randomized Search Heuristics - Foundations and Recent Developments",
- ◇ Journals: ACM Computing Reviews Algorithmica, Artificial Intelligence, Annals of Mathematics and Artificial Intelligence, Theoretical Computer Science, IEEE Transactions on Systems, Man and Cybernetics - Part B, IEEE Transactions on Evolutionary Computation, Evolutionary Computation Journal, The International Journal of Computational Intelligence and Applications, Information Sciences, Software Practice and Experience, IEEE Transactions on Software Engineering, Journal of Soft Computing, Journal of Global Optimization, BioSystems Journal of Computer Science and Technology
- ◇ Conferences: Assocation for the Advancement of Artificial Intelligence (AAAI), International Conference on Parallel Problem Solving From Nature (PPSN), Genetic and Evolutionary Computation Conference (GECCO), IEEE Congress on Evolutionary Computation (CEC), The 8th International Conference on Evolvable Systems: From Biology to Hardware (ICES 2008). The Seventh International Conference on Simulated Evolution And Learning (SEAL 2008).

Conference Organisation and Community Service

- ◇ Member of EPSRC Peer Review College, including evaluating grant proposals for EPSRC New Horizons funding scheme 2022.
- ◇ Work Group 4 lead (Optimisation under Uncertainty) of COST Action CA22137 Randomised Optimisation Algorithms Research Network (ROAR-NET)
- ◇ Co-chaired The First UK AI Conference 2023 Turing AI Fellowship Event, London, UK (with Lawrence (Cambridge), Liakata (Queen Mary), and Scaife (Manchester)).
- ◇ Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE) representative for School of Computer Science, University of Birmingham.
- ◇ Theory track chair, at Genetic and Evolutionary Computation Conference (GECCO), Prague, Czech Republic, July 2019 (with Johannes Lengler (ETH))
- ◇ Theory track chair, at Genetic and Evolutionary Computation Conference (GECCO), Kyoto, Japan, July 2018 (with Anne Auger (INRIA))
- ◇ Co-organizer of Dagstuhl Seminar on Evolution and Computing, Wadern, Germany, January 2016 (with Nick Barton (IST Austria), Bernard Chazelle (Princeton), Nisheeth K. Vishnoi (Yale)).
- ◇ Publicity chair, Genetic and Evolutionary Computation Conference (GECCO), Denver, CO, USA, July 2016.
- ◇ Workshop chair, Genetic and Evolutionary Computation Conference (GECCO), Vancouver, BC, Canada, July 2014
- ◇ Co-chair, 5th Workshop on Theory of Randomized Search Heuristics, Copenhagen, Denmark, July 2011.
- ◇ Co-chair, 3rd Workshop on Theory of Randomized Search Heuristics, Birmingham, UK, October 2009.
- ◇ Publicity chair of 1st International Symposium on Search Based Software Engineering (SSBSE 2009).
- ◇ Co-chair of workshop on Computational Intelligence for Software Engineering at IEEE World Congress on Computational Intelligence, Hong Kong (2008).
- ◇ Organiser of SEBASE Summer School, Birmingham, UK, (2007).
- ◇ Member of local organising committe ICES'2003, Trondheim, Norway.

Postdoc and PhD Supervision

- ◇ Mario Alejandro Hevia Fajardo (Research Fellow), March 2022-
- ◇ Alistair Benford (Research Fellow), February 2023-

- Duc-Cuong Dang (Research Fellow)
  January 2013 – December 2016.
- Shishen Lin (PhD student, first supervisor).
  September 2021 –
- Xiaoyu Qin (PhD student, first supervisor).
  January 2020 – November 2023.
- Tuo Zhang (PhD student, second supervisor) (20 %)
  January 2023 –
- Kevin Kurien Alex (PhD student, second supervisor) (20 %)
  October 2023 –
- Zimin Liang (PhD student, second supervisor) (20 %)
  Septeber 2011 –
- Sarah Carmesin (PhD student, second supervisor) (20 %)
  April 2021 –
- Phan Trun Hai Nguyen (PhD student, first supervisor).
  January 2017 – July 2021.
- Fawaz Alanazi (PhD student, first supervisor).
  Completed February 2017.
- Dogan Corus (PhD student, first supervisor)
  Completed December 2016.
- Xunzhao Yu (PhD student, second supervisor)
  June 2017 – July 2023.
- Daniel George Herring (PhD student, second supervisor)
  September 2017 – March 2023.
- Haneen Al Gethami (PhD student, second supervisor)
  March 2013 – February 2017.
- Efstratios Palias (PhD student, second supervisor)
  September 2020 –
- Shahriar Asta (PhD student, second supervisor)
  Completed September 2015.

PhD Examination

- Amirhossein Rajabi, Technical University of Denmark, Denmark, September 2022 (external)
- Weiqi Chen, University of Birmingham, UK, May 2018 (internal)
- Renzhi Chen, University of Birmingham, UK, December 2017 (internal)
- Christian Gießen, Technical University of Denmark, Denmark, December 2017 (external)
- Margarita Spichakova, Tallinn University of Technology, Estonia, September 2017 (external)
- Sandra Astete-Morales, Universite Paris Sud, France, September 2016 (external)
- Andrei Lissovoi, Technical University of Denmark, Denmark, April 2016 (external)
- Anas Elhag, University of Nottingham, UK, January 2015 (internal)
- Stefan Ravizza, University of Nottingham, UK, March 2013 (internal)

Teaching Experience

- Associate Fellow of the Higher Education Academy (PR086338)
- Evolutionary Computation (UG and PG) (2024)
- Nature Inspired Search and Optimisation (UG and PG) (co-taught with Jon Rowe), Birmingham (2018, 2019)
- Neural Computation (UG and PG), Birmingham (2017, 2018, 2019, 2020)
- Unix and Software Tools (UG), Nottingham
- Algorithmic Problem Solving (UG), Nottingham
- Mathematical Foundations of Computer Science (UG), Nottingham
- Programming and Algorithms (UG), Nottingham
- Advanced Data Structures (PG), Nottingham
- Advanced Algorithms and Data Structures (PG), Nottingham
- Logic (UG), Trondheim, Norway (2002)

Academic Duties

- REF Lead for School of Computer Science (2023-)

- ◇ Programme Director MRes Natural Computation, Birmingham (2017-)
- ◇ MSc Project Coordinator, Birmingham (2018-2020)
- ◇ One of five academics responsible for proposing the new undergraduate curriculum which was introduced in the School of Computer Science, University of Nottingham in 2015.
- ◇ As Teaching Quality Mentor, responsible for monitoring the quality of teaching in the School of Computer Science.
- ◇ Personal Tutor

BIBLIOMETRICS

- ◇ ORCID `https://orcid.org/0000-0002-9521-1251`
- ◇ H-index: 31 (Google Scholar, July 2024)

List of Publications[1]

[1] Per Kristian Lehre and Shishen Lin. Overcome binary adversarial optimisation: From (1,λ) evolutionary algorithm to (1,λ) co-evolutionary algorithm. In *In Proceedings of 18th International Conference on Parallel Problem Solving from Nature (PPSN 2024)*, 2024.

[2] Mario Alejandro Hevia Fajardo and Per Kristian Lehre. Ranking diversity benefits co-evolutionary algorithms on an intransitive game. In *In Proceedings of 18th International Conference on Parallel Problem Solving from Nature (PPSN 2024)*, pages xx–xx, 2024.

[3] Per Kristian Lehre. Runtime Analysis of Competitive Co-evolutionary Algorithms for Maximin Optimisation of a Bilinear Function. *Algorithmica*, April 2024.

[4] Per Kristian Lehre and Shishen Lin. Concentration tail-bound analysis of coevolutionary and bandit learning algorithms. To appear in Proceedings of The 33rd International Joint Conference on Artificial Intelligence (IJCAI-24).

[5] Alistair Benford and Per Kristian Lehre. Runtime analysis of coevolutionary algorithms on a class of symmetric zero-sum games. In Proceedings of Genetic and Evolutionary Computation Conference (GECCO '24).

[6] Alistair Benford, Markus Olhofer, Tobias Rodemann, and Per Kristian Lehre. Bicriteria optimisation of average and worst-case performance using coevolutionary algorithms. In Proceedings of IEEE Congress on Evolutionary Computation (IEEE CEC 2024).

[7] Mario Hevia Fajardo, Per Kristian Lehre, Jamal Toutouh, Erik Hemberg, and Una-May O'Reilly. Analysis of a Pairwise Dominance Coevolutionary Algorithm with Spatial Topology. In Stephan Winkler, Leonardo Trujillo, Charles Ofria, and Ting Hu, editors, *Genetic Programming Theory and Practice XX*, pages 19–44. Springer Nature, Singapore, 2024.

[8] Mario Alejandro Hevia Fajardo, Erik Hemberg, Jamal Toutouh, Una-May O'Reilly, and Per Kristian Lehre. Self-adaptive co-evolutionary algorithms. In Proceedings of Genetic and Evolutionary Computation Conference (GECCO'24).

[9] Duc-Cuong Dang and Per Kristian Lehre. The slo hierarchy of pseudo-boolean functions and runtime of evolutionary algorithms. In Proceedings of Genetic and Evolutionary Computation Conference (GECCO'24).

[10] Mario Alejandro Hevia Fajardo, Per Kristian Lehre, and Shishen Lin. Runtime analysis of a co-evolutionary algorithm: Overcoming negative drift in maximin-optimisation. In *Proceedings of the Companion Conference on Genetic and Evolutionary Computation*, GECCO '23 Companion, pages 819–822, New York, NY, USA, 2023. Association for Computing Machinery.

[11] Per Kristian Lehre and Xiaoyu Qin. Self-Adaptation Can Improve the Noise-Tolerance of Evolutionary Algorithms. In *Proceedings of the 17th ACM/SIGEVO Conference on Foundations of Genetic Algorithms*, FOGA '23, pages 105–116, Potsdam, Germany, 2023. Association for Computing Machinery.

[12] Per Kristian Lehre, Mario Alejandro Hevia Fajardo, Jamal Toutouh, Erik Hemberg, and Una-May O'Reilly. Analysis of a Pairwise Dominance Coevolutionary Algorithm And DefendIt. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '23, pages 1027–1035, New York, NY, USA, July 2023. Association for Computing Machinery.

[13] Per Kristian Lehre and Andrew M. Sutton. Runtime analysis with variable cost. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '23, pages 1611–1618, New York, NY, USA, 2023. Association for Computing Machinery.

[14] Mario Alejandro Hevia Fajardo and Per Kristian Lehre. How Fitness Aggregation Methods Affect the Performance of Competitive CoEAs on Bilinear Problems. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '23, pages 1593–1601, New York, NY, USA, July 2023. Association for Computing Machinery.

[15] Per Kristian Lehre and Xiaoyu Qin. Self-Adaptation Can Help Evolutionary Algorithms Track Dynamic Optima. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '23, pages 1619–1627. Association for Computing Machinery, 2023.

[1] Most of my publications order authors alphabetically.

[16] Per Kristian Lehre and Shishen Lin. Is CC-(1+1) ea more efficient than (1+1) EA on separable and inseparable problems? In *2023 IEEE Congress on Evolutionary Computation (CEC)*, pages 1–9, 2023.

[17] Per Kristian Lehre and Xiaoyu Qin. More Precise Runtime Analyses of Non-elitist Evolutionary Algorithms in Uncertain Environments. *Algorithmica*, October 2022.

[18] Xiaoyu Qin and Per Kristian Lehre. Self-adaptation via Multi-objectivisation: An Empirical Study. In *Parallel Problem Solving from Nature – PPSN XVII*, Lecture Notes in Computer Science, pages 308–323, Cham, 2022. Springer International Publishing.

[19] Per Kristian Lehre. Runtime analysis of competitive co-evolutionary algorithms for maximin optimisation of a bilinear function. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '22, pages 1408–1416, New York, NY, USA, July 2022. Association for Computing Machinery.

[20] Per Kristian Lehre and Xiaoyu Qin. Self-adaptation via multi-objectivisation: a theoretical study. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '22, pages 1417–1425, New York, NY, USA, July 2022. Association for Computing Machinery.

[21] Duc-Cuong Dang, Anton Eremeev, Per Kristian Lehre, and Xiaoyu Qin. Fast non-elitist evolutionary algorithms with power-law ranking selection. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '22, pages 1372–1380, New York, NY, USA, July 2022. Association for Computing Machinery.

[22] Per Kristian Lehre and Phan Trung Hai Nguyen. Runtime Analyses of the Population-Based Univariate Estimation of Distribution Algorithms on LeadingOnes. *Algorithmica*, 83(10):3238–3280, October 2021.

[23] Duc-Cuong Dang, Anton Eremeev, and Per Kristian Lehre. Non-elitist evolutionary algorithms excel in fitness landscapes with sparse deceptive regions and dense valleys. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '21, pages 1133–1141, New York, NY, USA, June 2021. Association for Computing Machinery.

[24] Per Kristian Lehre and Xiaoyu Qin. More precise runtime analyses of non-elitist EAs in uncertain environments. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '21, pages 1160–1168, New York, NY, USA, June 2021. Association for Computing Machinery.

[25] Duc-Cuong Dang, Anton Eremeev, and Per Kristian Lehre. Escaping Local Optima with Non-Elitist Evolutionary Algorithms. *Proceedings of the AAAI Conference on Artificial Intelligence*, 35(14):12275–12283, May 2021. Number: 14.

[26] Per Kristian Lehre and Carsten Witt. Tail bounds on hitting times of randomized search heuristics using variable drift analysis. *Combinatorics, Probability and Computing*, 30(4):550–569, July 2021. Publisher: Cambridge University Press.

[27] Brendan Case and Per Kristian Lehre. Self-Adaptation in Nonelitist Evolutionary Algorithms on Discrete Problems With Unknown Structure. *IEEE Transactions on Evolutionary Computation*, 24(4):650–663, August 2020.

[28] Anne Auger and Per Kristian Lehre. Preface to the Special Issue on Theory of Genetic and Evolutionary Computation 2018 (editorial). *Algorithmica*, 83:903–905, 2021.

[29] Anne Auger and Per Kristian Lehre. Editor's note: Special issue on genetic and evolutionary computation 2019 (editorial). *Algorithmica*, 83:3015–3016, 2021.

[30] Per Kristian Lehre and Dirk Sudholt. Parallel black-box complexity with tail bounds. To appear in IEEE Transacations on Evolutionary Computation, 2019.

[31] Per Kristian Lehre and Phan Trung Hai Nguyen. On the Limitations of the Univariate Marginal Distribution Algorithm to Deception and Where Bivariate EDAs Might Help. In *Proceedings of the 15th ACM/SIGEVO Conference on Foundations of Genetic Algorithms*, FOGA '19, pages 154–168, New York, NY, USA, 2019. ACM. event-place: Potsdam, Germany.

[32] Per Kristian Lehre and Phan Trung Hai Nguyen. Runtime Analysis of the Univariate Marginal Distribution Algorithm Under Low Selective Pressure and Prior Noise. In *Proceedings of the Genetic and Evolutionary Computation Conference*, GECCO '19, pages 1497–1505, New York, NY, USA, 2019. ACM. event-place: Prague, Czech Republic.

[33] Barbora TrubenovÃ¡, Martin S. Krejca, Per Kristian Lehre, and Timo KÃ¶tzing. Surfing on the seascape: Adaptation in a changing environment. *Evolution*, 73(7):1356–1374, 2019.

[34] Duc-Cuong Dang, Per Kristian Lehre, and Phan Trung Hai Nguyen. Level-Based Analysis of the Univariate Marginal Distribution Algorithm. *Algorithmica*, 81(2):668–702, February 2019.

[35] Duc-Cuong Dang and Per Kristian Lehre. Self-adaptation of Mutation Rates in Non-elitist Populations. In *Parallel Problem Solving from Nature - 14th International Conference, PPSN 2016, Proceedings*, Lecture Notes in Computer Science, pages 803–813. Springer, Cham, September 2016.

[36] Per Kristian Lehre and Pietro S. Oliveto. Theoretical Analysis of Stochastic Search Algorithms. In Rafael Marti, Pardalos Panos, and Mauricio G. C. Resende, editors, *Handbook of Heuristics*, pages 1–36. Springer International Publishing, Cham, 2018.

[37] Dogan Corus, Duc-Cuong Dang, Anton V. Eremeev, and Per Kristian Lehre. Level-Based Analysis of Genetic Algorithms and Other Search Processes. *IEEE Transactions on Evolutionary Computation*, 22(5):707–719, October 2018.

[38] Dogan Corus and Per Kristian Lehre. Theory Driven Design of Efficient Genetic Algorithms for a Classical Graph Problem. In *Recent Developments in Metaheuristics*, Operations Research/Computer Science Interfaces Series, pages 125–140. Springer, Cham, 2018.

[39] Duc-Cuong Dang, Tobias Friedrich, Timo KÃ¶tzing, Martin S. Krejca, Per Kristian Lehre, Pietro S. Oliveto, Dirk Sudholt, and Andrew M. Sutton. Escaping Local Optima Using Crossover With Emergent Diversity. *IEEE Transactions on Evolutionary Computation*, 22(3):484–497, June 2018.

[40] Duc-Cuong Dang, Thomas Jansen, and Per Kristian Lehre. Populations Can Be Essential in Tracking Dynamic Optima. *Algorithmica*, 78(2):660–680, June 2017.

[41] Per Kristian Lehre and Phan Trung Nguyen. Improved Runtime Bounds for the Univariate Marginal Distribution Algorithm via Anti-Concentration. In *Proceedings of the Genetic and Evolutionary Computation Conference (2017)*. ACM Press, 2017.

[42] Dogan Corus, Per Kristian Lehre, Frank Neumann, and Mojgan Pourhassan. A parameterised complexity analysis of bi-level optimisation with evolutionary algorithms. *Evolutionary Computation*, 24(1):183–203, March 2016.

[43] Duc-Cuong Dang, Thomas Jansen, and Per Kristian Lehre. Populations can be essential in tracking dynamic optima. Accepted for publication in Algorithmica, 2016.

[44] Duc-Cuong Dang, Tobias Friedrich, Timo Koetzing, Martin S. Krejca, Per Kristian Lehre, Pietro S. Oliveto, Dirk Sudholt, and Andrew M. Sutton. Emergence of diversity and its benefits for crossover in genetic algorithms. To appear in Proceedings of 14th International Conference on Parallel Problem Solving from Nature (PPSN) 2016.

[45] Duc-Cuong Dang, Tobias Friedrich, Timo Koetzing, Martin S. Krejca, Per Kristian Lehre, Pietro S. Oliveto, Dirk Sudholt, and Andrew M. Sutton. Escaping local optima with diversity mechanisms and crossover. To appear in Proceedings of Genetic and Evolutionary Computation Conference (GECCO 2016), Denver, Colorado, USA 2016.

[46] Fawaz Alanazi and Per Kristian Lehre. Limits to Learning in Reinforcement Learning Hyper-heuristics. In *Proceedings of 16th European Conference on Evolutionary Computation in Combinatorial Optimisation (EvoCOP)*, volume 9595, pages 170–185, March 2016.

[47] Tiago Paixao, Golnaz Badkobeh, Nick Barton, Dogan Corus, Duc-Cuong Dang, Tobias Friedrich, Per Kristian Lehre, Dirk Sudholt, Andrew M. Sutton, and Barbora TrubenovÃ¡. Toward a unifying framework for evolutionary processes. *Journal of Theoretical Biology*, 383:28–43, October 2015.

[48] Duc-Cuong Dang, Thomas Jansen, and Per Kristian Lehre. Populations can be essential in dynamic optimisation. In *Proceedings of the 2015 Annual Conference on Genetic and Evolutionary Computation*, GECCO '15, pages 1407–1414, New York, NY, USA, 2015. ACM.

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