

Joshua Knowles
Honorary
MSM General



Overview

Joshua Knowles is a research scientist at Schlumberger Cambridge Research Ltd, in Cambridgeshire, UK.

Current Employment

Honorary Professor

Honorary
MSM General
The University of Manchester
24 Jan 2024 → present

Principal Scientist

Schlumberger Cambridge Research
Cambridge, United Kingdom
11 Apr 2022 → present

Honorary Fellow

University of Birmingham
Birmingham, United Kingdom
2 Apr 2019 → present

Previous Employment

Senior Researcher

Invenia Labs
Cambridge, United Kingdom
30 Jun 2020 → 15 Mar 2022

Research outputs (50 most recent)

A Minimal Model for the Emergence of Cooperation in Networks
Knowles, J., 2015, *European Conference on Artificial Life*.

Ephemeral Resource Constraints in Optimization

Knowles, J., Allmendinger, R., Datta, R. (Editor) & Deb, K. (Editor), 2014, *Evolutionary Constrained Optimization*.
Springer Nature

Learning in Multiobjective Optimization (Dagstuhl Seminar 12041)

Knowles, J. D., Greco, S. (Editor), Miettinen, K. (Editor) & Zitzler, E. (Editor), 2012, Leibniz-Zentrum für Informatik. 50 p.
(Dagstuhl Reports)

Noisy multiobjective optimization on a budget of 250 evaluations

Knowles, J., Corne, D. & Reynolds, A., 2010, *Evolutionary Multi-Criterion Optimization - 5th International Conference, EMO 2009, Proceedings*. p. 36-50 15 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 5467 LNCS).

EMO in the Lab: Optimization in Synthetic- and Systems Biology
Knowles, J., 2008.

Introduction: Problem Solving, EC and EMO

Knowles, J., Corne, D. & Deb, K., 2008, *Natural Computing Series*. Springer Nature, p. 1-28 28 p. (Natural Computing Series).

Quantifying the effects of objective space dimension in evolutionary multiobjective optimization

Knowles, J. & Corne, D., 2007, *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)/Lect. Notes Comput. Sci.*. Springer Nature, Vol. 4403. p. 757-771 14 p.

ParEGO: A hybrid algorithm with on-line landscape approximation for expensive multiobjective optimization problems

Knowles, J., Feb 2006, In: *IEEE Transactions on Evolutionary Computation*. 10, 1, p. 50-66 16 p.

Applications of Soft Computing: Recent Trends

Knowles, J., Tiwari, A. (Editor), Avineri, E. (Editor), Dahal, K. (Editor) & Roy, R. (Editor), 2006, Berlin-Heidelberg: Springer Nature.

The assignment of referees to WSCIO submissions: An evolutionary approach

Knowles, J., 2006, *Applications of Soft Computing: Recent Trends*. p. 341-350 10 p. (Advances in Soft Computing; vol. 36).

A summary-attainment-surface plotting method for visualizing the performance of stochastic multiobjective optimizers

Knowles, J., 2005, *Proceedings - 5th International Conference on Intelligent Systems Design and Applications 2005, ISDA '05/Proc. 5th Int. Conf. Intell. Syst. Design and Applic. ISDA '05*. Vol. 2005. p. 552-557 5 p.

Multiobjective optimization on a budget of 250 evaluations

Knowles, J. & Hughes, E. J., 2005, *Lecture Notes in Computer Science/Lect. Notes Comput. Sci.*. Coello Coello, C. A., Hernandez Aguirre, A. & Zitzler, E. (eds.). Springer Nature, Vol. 3410. p. 176-190 14 p. (LNCS).

Bounded Pareto Archiving: Theory and Practice

Knowles, J. & Corne, D., Jan 2004, *Metaheuristics for Multiobjective Optimisation*. Springer Nature, Vol. 535. (LNEMS).

Memetic Algorithms for Multiobjective Optimization: Issues, Methods and Prospects

Knowles, J. & Corne, D., 2004, *Recent Advances in Memetic Algorithms*. Springer Nature, p. 313-352 40 p.

Properties of an adaptive archiving algorithm for storing nondominated vectors

Knowles, J. & Corne, D., Apr 2003, In: *IEEE Transactions on Evolutionary Computation*. 7, 2, p. 100-116 16 p.

Bounded archiving using the lebesgue measure

Knowles, J. D., Corne, D. W. & Fleischer, M., 2003, *2003 Congress on Evolutionary Computation, CEC 2003 - Proceedings/Congr. Evol. Comput., CEC - Proc.* IEEE Computer Society , Vol. 4. p. 2490-2497 7 p.

Instance generators and test suites for the multiobjective quadratic assignment problem

Knowles, J. & Corne, D., 2003, *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)/Lect. Notes Comput. Sci.*. Springer Nature, Vol. 2632. p. 295-310 15 p. (LNCS).

The good of the many outweighs the good of the one: evolutionary multi-objective optimization

Knowles, J. D., Corne, D. W., Deb, K. & Fleming, P. J., 2003, In: *IEEE coNNnectionS*. 1, 1, p. 9-13

Local-Search and Hybrid Evolutionary Algorithms for Pareto Optimization
Knowles, J., 2002, University of Reading.

On Metrics for Comparing Non-Dominated Sets

Knowles, J. & Corne, D., 2002, *Proceedings of the 2002 Congress on Evolutionary Computation Conference (CEC02)*. IEEE, p. 711-716 6 p.

On the Utility of Redundant Encodings in Mutation-based Evolutionary Search

Knowles, J. D. & Watson, R. A., 2002, *Parallel Problem Solving from Nature (PPSN-VII)*. Springer Nature, Vol. 2432. p. 88-98 11 p. (LNCS).

Towards landscape analyses to inform the design of a hybrid local search for the multiobjective quadratic assignment problem

Knowles, J., Corne, D., Abraham, A. (Editor), Ruiz-del-Solar, J. (Editor) & Köppen, M. (Editor), 2002, *Soft Computing Systems: Design, Management and Applications*. IOS Press, p. 271-279 9 p.

A Comparative Assessment of Memetic, Evolutionary, and Constructive Algorithms on Multiobjective \$d\$-MST Problems

Knowles, J. D. & Corne, D. W., 2001, *Proceedings of the Genetic and Evolutionary Computation Conference Workshop Program*. p. 162-167 6 p.

A comparison of encodings and algorithms for multiobjective minimum spanning tree problems

Knowles, J. D. & Corne, D. W., 2001, *Proceedings of the IEEE Conference on Evolutionary Computation, ICEC/Proc IEEE Conf Evol Comput Proc ICEC*. IEEE, Vol. 1. p. 544-551 7 p.

Benchmark Problem Generators and Results for the Multiobjective Degree-Constrained Minimum Spanning Tree Problem

Knowles, J. D. & Corne, D. W., 2001, *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2001)*. p. 424-431 8 p.

Reducing Local Optima in Single-Objective Problems by Multi-objectivization

Knowles, J. D., Watson, R. A. & Corne, D. W., 2001, *Evolutionary Multi-Criterion Optimization (EMO'01)*. Springer Nature, Vol. 1993. p. 269-283 15 p. (LNCS).

A comparison of diverse approaches to memetic multiobjective combinatorial optimization

Knowles, J. D. & Corne, D. W., 8 Jul 2000, *Data Mining with Evolutionary Algorithms*. p. 103-108 6 p.

Advanced Multiobjective Evolutionary Algorithms Applied to two Problems in Telecommunications

Knowles, J. D., Oates, M. J. & Corne, D. W., 2000, In: BT Technology Journal. 18, 4, p. 51-65 15 p.

Evolving Neural Networks for Cancer Radiotherapy

Knowles, J. D., Corne, D. W. & Chambers, L. D. (Editor), 2000, *Practical Handbook of Genetic Algorithms: Applications, Second Edition*. Boca Raton, Florida: Chapman & Hall, p. 443-488 46 p.

Heuristics for Evolutionary Off-line Routing in Telecommunications Networks

Knowles, J. D. & Corne, D. W., 2000, *Proceedings of the Genetic and Evolutionary Computation Conference*. Morgan Kaufmann Publishers, p. 574-581 8 p.

M-PAES: A memetic algorithm for multiobjective optimization

Knowles, J. D. & Corne, D. W., 2000, *Proceedings of the IEEE Conference on Evolutionary Computation, ICEC/Proc IEEE Conf Evol Comput Proc ICEC*. Piscataway, NJ, United States: IEEE, Vol. 1. p. 325-332 7 p.

Multiobjective Approaches to the Adaptive Distributed Database Management Problem

Knowles, J. D. & Corne, D. W., 2000, *Proceedings of the SAB/PPSN Workshops (Evolutionary Computation in Telecommunications Workshop)*.

On the Assessment of Multiobjective Approaches to the Adaptive Distributed Management Problem

Knowles, J. D., Corne, D. W. & Oates, M. J., 2000, *Proceedings of the Sixth International Conference of Parallel Problem Solving From Nature (PPSN VI)*. Springer Nature, p. 869-878 10 p.

The Pareto Archived Evolution Strategy: A New Baseline Algorithm for Multiobjective Optimisation

Knowles, J. D. & Corne, D. W., Jul 1999, *Proceedings of the 1999 Congress on Evolutionary Computation (CEC'99)*. IEEE , p. 98-105 8 p.

A New Evolutionary Approach to the Degree Constrained Minimum Spanning Tree Problem

Knowles, J., Corne, D., Oates, M., Banzhaf, W. (Editor), Daida, J. (Editor), Eiben, A. E. (Editor), Garzon, M. H. (Editor), Honavar, V. (Editor), Jakielka, M. (Editor) & Smith, R. E. (Editor), 1999, *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-99)*. Banzhaf, W., Daida, J., Eiben, A. E., Garzon, M. H., Honavar, V., Jakielka, M. & Smith, R. E. (eds.). Morgan Kaufmann Publishers

Assessing the Performance of the Pareto Archived Evolution Strategy

Knowles, J. D., Corne, D. W. & Wu, A. S. (Editor), 1999, *Proceedings of the 1999 Genetic and Evolutionary Computation Conference Workshop Program*. Wu, A. S. (ed.). p. 123-124 2 p.

Local Search, Multiobjective Optimization and the Pareto Archived Evolution Strategy

Knowles, J. D. & Corne, D. W., 1999, *Proceedings of Third Australia-Japan Joint Workshop on Intelligent and Evolutionary Systems*. University of New South Wales and Ashikaga Institute of Technology, p. 209-216 8 p.

Evolutionary training of artificial neural networks for radiotherapy treatment of cancers

Knowles, J., Corne, D. & Bishop, M., 1998, *Proceedings of the IEEE Conference on Evolutionary Computation, ICEC|Proc IEEE Conf Evol Comput Proc ICEC*. Anon (ed.). Piscataway, NJ, United States: IEEE, p. 398-403 5 p.

Projects

Extend the functionality of an existing product platform by incorporating an algorithm to enable customers to develop optimised bioprocesses and reduce product costs.

Allmendinger, R. (PI) & Knowles, J. (Col)

1/01/17 → 31/12/18

Prizes

ACM GECCO Impact Award

Knowles, J. (Recipient), 1 Jun 2017

David Phillips Fellowship

Knowles, J. (Recipient), 1 Oct 2003

IEEE Transactions on Evolutionary Computation Outstanding Paper Award

Knowles, J. (Recipient), 1 Jun 2006

IEEE Transactions on Evolutionary Computation Outstanding Paper Award

Knowles, J. (Recipient), 1 Jun 2008

Marie Skłodowska-Curie Fellowship

Knowles, J. (Recipient), 1 Oct 2001