Dr. Ke Li

Innovation Centre A1-D
University of Exeter
North Park Road, Exeter, EX4 4QF, UK

Email: k.li@exeter.ac.uk
Homepage: https://coda-group.github.io/
Phone: +(44) 0139-272-4557

Research Interests

Computational Intelligence

Large-Scale Optimization

Optimization in Dynamic and Uncertain Environments

Search-Based Software Engineering

Data Mining and Big Data Analytics

Education

Doctor of Philosophy, Department of Computer Science, City University of Hong Kong, 2014

Masters of Engineering, College of Information and Engineering, Xiangtan University, 2010

Bachelor of Engineering, College of Information and Engineering, Xiangtan University, 2007

Work Experiences

Lecturer (Assistant Professor) in Data Analytics, College of Engineering, Mathematics and Physical Sciences, University of Exeter, Dec. 2016∼present

Research Fellow, School of Computer Science, University of Birmingham, Oct. 2015∼Nov. 2016

Postdoctoral Research Associate, Department of Electrical and Computer Engineering, Michigan State University, Sep. 2014∼Aug. 2015

Research Associate, Department of Computer Science, City University of Hong Kong, Aug. 2013∼Jul. 2014

Visiting Scholar, Department of Electrical and Computer Engineering, Michigan State University, Dec. 2013∼Apr. 2014

Publications

5 Most Significant Papers

1. **Ke Li**, Qingfu Zhang, Sam Kwong, Miqing Li, Ran Wang, Stable Matching Based Selection in Evolutionary Multiobjective Optimization, IEEE Transactions on Evolutionary Computation (TEVC), 18(6): 909-923, 2014. (SCI IF=5.908) (**Top 50 popular article in IEEE TEVC**)

2. **Ke Li**, Álvaro Fialho, Sam Kwong and Qingfu Zhang, Adaptive Operator Selection with Bandits for Multi-objective Evolutionary Algorithm Based on Decomposition, IEEE Transactions on Evolutionary Computation (TEVC), 18(1): 114-130, 2014. (SCI IF=5.908) (**Top 50 popular article in IEEE TEVC**)

3. **Ke Li**, Kalyanmoy Deb, Qingfu Zhang, Sam Kwong, An Evolutionary Many-Objective Optimization Algorithm Based on Dominance and Decomposition, IEEE Transactions on Evolutionary Computation (TEVC), 19(5): 694–716, 2015. (SCI IF=5.908) (**Top 50 popular article in IEEE TEVC**)
4. **Ke Li**, Sam Kwong, Qingfu Zhang, Kalyanmoy Deb, Interrelationship-based Selection for Decomposition Multiobjective Optimization, IEEE Transactions on Cybernetics (TCYB), 45(10): 2076–2088, 2015. (SCI IF=4.943) (**Top 50 popular article in IEEE TCYB**)
5. **Ke Li**, Kalyanmoy Deb, Qingfu Zhang, Qiang Zhang, Efficient Non-domination Level Update Approach for Steady-State Evolutionary Multiobjective Optimization. IEEE Transactions on Cybernetics, accepted for publication, 2016. (SCI IF=4.943)

Journal Papers

1. Renzhi Chen[1], **Ke Li**[1], Xin Yao, Dynamic Multi-Objectives Optimization with a Changing Number of Objectives. IEEE Transactions on Evolutionary Computation (TEVC), accepted for publication, 2017. (SCI IF=5.908)
2. Mengyuan Wu, **Ke Li**, Sam Kwong, Yu Zhou, Qingfu Zhang, Matching-Based Selection with Incomplete Lists for Decomposition Multi-Objective Optimization. IEEE Transactions on Evolutionary Computation (TEVC), accepted for publication, 2017. (SCI IF=5.908)
3. **Ke Li**, Kalyanmoy Deb, Qingfu Zhang, Qiang Zhang, Efficient Non-domination Level Update Approach for Steady-State Evolutionary Multiobjective Optimization. IEEE Transactions on Cybernetics (TCYB), accepted for publication, 2016. (SCI IF=4.943)
4. Haoran Xie, Xiaodong Li, Tao Wang, Li Chen, **Ke Li**, Fu-Lee Wang, Yi Cai, Qing Li, Huaqing Min, Personalized Search for Social Media via Dominating Verbal Context, Neurocomputing (NEUCOM), 172: 27–37, 2016. (SCI IF=2.392)
5. **Ke Li**, Kalyanmoy Deb, Qingfu Zhang, Sam Kwong, An Evolutionary Many-Objective Optimization Algorithm Based on Dominance and Decomposition, IEEE Transactions on Evolutionary Computation (TEVC), 19(5): 694–716, 2015. (SCI IF=5.908)
6. **Ke Li**, Sam Kwong, Qingfu Zhang, Kalyanmoy Deb, Interrelationship-based Selection for Decomposition Multiobjective Optimization, IEEE Transactions on Cybernetics (TCYB), 45(10): 2076–2088, 2015. (SCI IF=4.943)
7. **Ke Li**, Sam Kwong, Kalyanmoy Deb, A Dual Population Paradigm for Evolutionary Multiobjective Optimization, Information Sciences (INS), 309: 50–72, 2015. (SCI IF=3.364)
8. **Ke Li**, Qingfu Zhang, Sam Kwong, Miqing Li, Ran Wang, Stable Matching Based Selection in Evolutionary Multiobjective Optimization, IEEE Transactions on Evolutionary Computation (TEVC), 18(6): 909-923, 2014. (SCI IF=5.908)
9. Jingjing Cao, Sam Kwong, Ran Wang, Xiaodong Li, **Ke Li** and Xiangfei Kong, Class-Specific Soft Voting based Multiple Extreme Learning Machines Ensemble, Neurocomputing (NEUCOM), 149: 275-284, 2015. (SCI IF=2.392)
10. **Ke Li** and Sam Kwong, A General Framework for Evolutionary Multiobjective Optimization via Manifold Learning, Neurocomputing (NEUCOM), 146: 65-74, 2014. (SCI IF=2.392)
11. Miqing Li, Shengxiang Yang, **Ke Li** and Xiaohui Liu, Evolutionary algorithms with segment-based search for multiobjective optimization problems, IEEE Transactions on Cybernetics (TCYB), 44(8): 1295-1313, 2014. (SCI IF=4.943)

[1]The First two authors make equal contributions to this work and are sorted alphabetically.

12. **Ke Li**, Álvaro Fialho, Sam Kwong and Qingfu Zhang, Adaptive Operator Selection with Bandits for Multi-objective Evolutionary Algorithm Based on Decomposition, IEEE Transactions on Evolutionary Computation (TEVC), 18(1): 114-130, 2014. (SCI IF=5.908)

13. **Ke Li**, Ran Wang, Sam Kwong and Jingjing Cao, Evolving Extreme Learning Machine Paradigm with Adaptive Operator Selection and Parameter Control, International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems (IJUFKS), 21(supp02): 143-154, 2013. (SCI IF=1.000)

14. **Ke Li**, Sam Kwong, Ran Wang, Kit-Sang Tang and Kim-Fung Man, Learning Paradigm Based on Jumping Genes: A General Framework for Enhancing Exploration in Evolutionary Multiobjective Optimization, Information Sciences (INS), 226(1): 1-22, 2013. (SCI IF=3.364)

15. **Ke Li**, Sam Kwong, Jingjing Cao, Miqing Li, Jinhua Zheng and Ruimin Shen, Achieving Balance Between Proximity and Diversity in Multi-objective Evolutionary Algorithm, Information Sciences (INS), 182(1): 220-242, 2012. (SCI IF=3.364)

16. **Ke Li**, Jinhua Zheng, Miqing Li, Cong Zhou and Hui Lv, A Novel Slicing Based Algorithm to Calculate Hypervolume for Multi-Objective Optimization Problems, ICIC Express Letters: An International Journal of Research and Surveys, 4(4): 1113-1120, 2010.

Refereed Conference Papers

1. Mengyuan Wu, Sam Kwong, Yuliang Jia, **Ke Li** and Qingfu Zhang, Adaptive Weights Generation for Decomposition-Based Multi-Objective Optimization Using Gaussian Process Regression, In "GECCO'17: Proc. of the 18th Annual Conference on Genetic and Evolutionary Computation, accepted for publication, 2017.

2. **Ke Li**, Kalyanmoy Deb, Tolga Altinoz and Xin Yao, Empirical Investigations of Reference Point Based Methods When Facing a Massively Large Number of Objectives: First Results, In "EMO'17: Proc. of the 9th International Conference on Evolutionary Multi-Criterion Optimization, Springer, LNCS, Volume 10173: p. 390-405, March 2017.

3. **Ke Li**, Mohammad Nabi Omidvar, Kalyanmoy Deb and Xin Yao, Variable Interaction in Multi-Objective Optimization, In "PPSN'16: Proc. of the 14th International Conference on Parallel Problem Solving from Nature", Springer, LNCS, Vol. 9921: p. 399-409, 2016.

4. Mengyuan Wu, Sam Kwong, Qingfu Zhang, **Ke Li**, Ran Wang and Bo Liu, Two-Level Stable Matching-Based Selection in MOEA/D, In "SMC'15: Proc. of 2015 IEEE Conference on Systems, Mans and Cybernetics", IEEE Press: p. 1720-1725, October, 2015.

5. **Ke Li**, Kalyanmoy Deb and Qingfu Zhang, Evolutionary Multiobjective Optimization with Hybrid Selection Principles, In "CEC'15: Proc. of 2015 IEEE Congress on Evolutionary Computation", IEEE Press: p. 900-907, May 2015.

6. **Ke Li**, Sam Kwong, Ran Wang, Jingjing Cao and Imre J. Rudas, Multi-Objective Differential Evolution with Self-Navigation, In "SMC'12: Proc. of 2012 IEEE International Conference on Systems, Mans and Cybernetics", IEEE Press: p. 508-513, October 2012.

7. Jingjing Cao, Sam Kwong, Ran Wang and **Ke Li**, A Weighted Voting Method Using Minimum Square Error Based on Extreme Learning Machine, In "ICMLC'12: Proc. of 2012 IEEE International Conference on machine learning and cybernetics", IEEE Press: p. 411-414, July 2012.

8. Jingjing Cao, Hanli Wang, Sam Kwong and **Ke Li**, Combining Interpretable Fuzzy Rule-Based Classifiers via Multi-objective Hierarchical Evolutionary Algorithm, In "SMC'11: Proc. of 2011 IEEE International Conference on Systems, Mans and Cybernetics", IEEE Press: p. 1771-1776, October 2011.

9. **Ke Li**, Sam Kwong and Kim-Fung Man, JGBL Paradigm: A Novel Strategy to Enhance the Exploration Ability of NSGA-II, In "GECCO'11: Proc. of the 12th Annual Conference on Genetic and Evolutionary Computation", ACM Press: p. 99-100. July 2011.

10. **Ke Li**, Álvaro Fialho and Sam Kwong, Multi-Objective Differential Evolution with Adaptive Control of Parameters and Operators, In "LION'11: Proc. of the 5th International Conference on Learning and Intelligent OptimizatioN", Springer Verlag, LNCS, p. 473-487, January 2011.

11. Miqing Li, Jinhua Zheng, **Ke Li**, Qizhao Yuan and Ruimin Shen, Enhancing Diversity for Average Ranking Method in Evolutionary Many-Objective Optimization, In "PPSN'10: Proc. of the 11th International Conference on Parallel Problem Solving from Nature", Springer, LNCS, Vol. 6238: p. 647-656, September 2010.

12. Miqing Li, Jinhua Zheng, Ruimin Zhen, **Ke Li** and Qizhao Yuan, A Grid-based Fitness Strategy for Evolutionary Many-Objective Optimization, In "GECCO'10: Proc. of the 11th Annual Conference on Genetic and Evolutionary Computation", ACM Press: p. 463-470, July 2010.

13. **Ke Li**, Jinhua Zheng, Miqing Li, Cong Zhou, Hui Lv. A Novel Algorithm for Non-dominated Hypervolume-based Multiobjective Optimization. In "SMC'09: Proc. of 2009 IEEE International Conference on Systems, Mans and Cybernetics", IEEE Press: p. 5220-5226. December 2009.

14. Miqing Li, Jinhua Zheng, **Ke Li**, Jun Wu and Guixia Xiao, An Spanning Tree Based Method For Pruning Non-Dominated Solutions in Multi-Objective Optimization Problems, In "SMC'09: Proc. of 2009 IEEE International Conference on Systems, Mans and Cybernetics", IEEE Press: p. 4882-4887, December 2009.

15. Cong Zhou, Jinhua Zheng, **Ke Li** and Hui Lv, Objective Reduction based on the Least Square Method for Large-Dimensional Multiobjective Optimization Problem, In "ICNC'09: Proc. of the 5th International Conference on Natural Computation", IEEE Press: p. 350-354, August 2009.

16. Hui Lv, Jinhua Zheng, Jun Wu, Cong Zhou and **Ke Li**, The Convergence Analysis of Genetic Algorithm based on Space Mating, In "ICNC'09: Proc. of the 5th International Conference on Natural Computation", IEEE Press: p. 557-562, August 2009.

17. **Ke Li** and Jinhua Zheng, An Improved Multi-objective Evolutionary Algorithm based on Differential Evolution, In "CSIE'09 Proc. of 2009 WRI World Congress on Computer Science and Information Engineering", IEEE Press: p. 825-830, April 2009.

Working Papers

1. M. Wu, **Ke Li**, S. Kwong, Q. Zhang, Evolutionary Many-Objective Optimization Based on Adversarial Decomposition, April, 2017.

2. **Ke Li**, Kalyanmoy Deb and Xin Yao, R-Metric: Evaluating the Performance of Preference-Based Evolutionary Multi-Objective Optimization Using Reference Points, February, 2017.

3. Tao Chen, **Ke Li**, Rami Bahsoon and Xin Yao, FEMOSAA: Feature Guided and Knee Driven Multi-Objective Optimization for Self-Adaptive Software at Runtime, February, 2017.

4. **Ke Li**, Kalyanmoy Deb and Xin Yao, Integration of Preferences in Decomposition-Based Evolutionary Multi-Objective Optimization, January, 2017.

Teaching Experiences

Network, Data and Information (ECMM420), University of Exeter, Term 2, 2016/2017

Evolutionary Multi-Criterion Optimization and Decision Making (ECE 802-605), Michigan State University, Semester B, 2014/2015

Introduction to Internet and Programming (CS1303), City University of Hong Kong, Semester B, 2012/2013

Computer Networks and Internets (CS5222), City University of Hong Kong, Semester A, 2012/2013

Object-Oriented Programming (CS2332), City University of Hong Kong, Semester B, 2011/2012

Computer Networks and Internets (CS5222), City University of Hong Kong, Semester A, 2011/2012

Software Engineering (CS5351), City University of Hong Kong, Semester B, 2010/2011

Software Quality Engineering (CS5348), City University of Hong Kong, Semester A, 2010/2011

Research Grants

EPSRC (Grant No. EP/J017515/1) "DAASE: Dynamic Adaptive Automated Software Engineering", Key Member (involved), £ 6,834,903, Jun. 2012∼ May. 2018

EPSRC (Grant No. EP/K001523/1) "Evolutionary Computation for Dynamic Optimisation in Network Environments", Key Member (involved), £ 512,325, Feb. 2013∼ Feb. 2017

Hong Kong Research Grants Council General Research Funding (Grant No. 11205314) "Stable Matching Theory in Multiobjective Evolutionary Algorithm based on Decomposition (MOEA/D)", Co-PI at large, HK$ 692,894, Aug. 2014∼Dec. 2017

National Natural Science Foundation of China (Grant No. 61502408): "Research on Key Problems in Dynamic Environment Multi-objective Evolutionary Optimization", Co-PI, RMB 250,000, Aug. 2015∼Jul. 2018

Awards

Research Tuition Scholarship of City University of Hong Kong, 2013 (HK$ 42,072)

College of Science and Engineering Student Research Excellence Awards (First Class), 2013 (HK$ 15,000)

College of Science and Engineering Student Research Excellence Awards (Second Class), 2012 (HK$ 10,000)

Research Tuition Scholarship of City University of Hong Kong, 2012 (HK$ 42,072)

Studentship of City University of Hong Kong, 2010∼2013 (HK$ 180,000 per year)

Outstanding Master Thesis of Xiangtan University, 2010

Outstanding Graduate of Hunan Province, 2010

Outstanding Graduate of Xiangtan University, 2010

President Scholarship of Xiangtan University, 2010

"Lian Xin Yong Yi" Computer Science Scholarship, 2009 (RMB 2,000)

"Three-good Student" of Xiangtan University, 2009

Prize of Excellent Team in Innovation of Science and Technology, 2009

Excellent Member of The Communist Youth League for Graduate Student, 2009

Excellent Undergraduate Dissertation of Xiangtan University, 2007

Outstanding Graduate of Xiangtan University, 2007

Invited Talks

"Evolutionary multi-objective optimisation: effectiveness, scalability and efficiency", Department of Computer Science, University of Exeter, February 2, 2017.

"Achieving Balance Between Convergence and Diversity in Evolutionary Multi-Objective Optimization", Department of Mathematical Sciences, University of Essex, September 29, 2016.

"Achieving Balance Between Convergence and Diversity in Evolutionary Multi-Objective Optimization", IEEE Computational Intelligence Society (CIS) Webinar for Early Career Researcher, April 25, 2016.

"Achieving Balance Between Convergence and Diversity in Evolutionary Multi-Objective Optimization", Nature Inspired Computing and Engineering (NICE) research group, University of Surrey, April 13, 2016.

"Evolutionary Multi-Objective Optimization: Pushing the Boundaries", Job talk, University of Exeter, July 7, 2015.

"Evolutionary Multiobjective Optimization with Hybrid Selection Principles, 2015 IEEE Congress on Evolutionary Computation (CEC'15), Sendai, Japan, May 26, 2015."

"Performance Assessment for Preference-Based Evolutionary Multi-Objective Optimization", BEACON NSF STC Congress, Michigan State University, January 26, 2015.

"Multi-Objective Differential Evolution with Adaptive Control of Parameters and Operators", 2011 International Conference on Learning and Intelligent OptimizatioN, Rome, Italy, Jan. 18, 2011.

Academic Supervisions

Qi Xu (PhD) at the Department of Computer Science, University of Exeter, Sep. 2017∼present.

Joseph Billingsley (PhD) at the Department of Computer Science, University of Exeter (Co-supervising with Prof. Geyong Min), Apr. 2017∼present.

Renzhi Chen (PhD) at the School of Computer Science, University of Birmingham (Co-supervising with Prof. Xin Yao), Oct. 2015∼present.

Mengyuan Wu (PhD) at the Department of Computer Science, City University of Hong Kong (Co-supervising with Prof. Sam Kwong), Sep. 2014∼present.

Yan Xiong (Graduate) at the School of Computer Science, University of Birmingham (Co-supervising with Prof. Xin Yao), Jun. 2016∼Sep. 2016.

Zhichao Lu (PhD) at the Department of Electrical and Computer Engineering, Michigan State University (Co-supervising with Prof. Kalyanmoy Deb), Sep. 2014∼present.

Professional Services

Chair

Founding Chair of IEEE CIS Task Force on Decomposition-based Techniques in Evolutionary Computation, 2017∼present.

Membership

ACM professional member, 2013∼present.

IEEE member, 2017∼present.

IEEE student member, 2010∼2014.

Reviewer of Journals

IEEE Transactions on Evolutionary Computation

IEEE Transactions on Cybernetics

IEEE Transactions on Emerging Topics in Computation Intelligence

IEEE Transactions on Fuzzy Systems

IEEE Transactions on Industrial Electronics

IEEE Transactions on Knowledge and Data Engineering

IEEE Transactions on Vehicular Technology

Evolutionary Computation

European Journal of Operational research

Swarm and Evolutionary Computation

Frontiers of Computer Science

Information Sciences

Expert Systems with Applications

Applied Soft Computing

Computers & Operations Research

Neurocomputing

Memetic Computing

Soft Computing

International Journal of Systems Science

Pervasive and Mobile Computing

Future Generation Computer Systems

Conference Program Committee/Reviewer

The 2014 to 2016 Genetic and Evolutionary Computation Conference (GECCO'14 and GECCO'17)

The 2014 to 2016 IEEE Congress of Evolutionary Computation (CEC'14 to CEC'17)

The 17th UK Workshop on Computational Intelligence (UKCI'17)

The 2017 COMPSAC Symposia: Data Sciences, Analytics & Technologies (DSAT'17)

The 2016 IEEE Symposium Series on Computational Intelligence (SSCI'16)

The 2013 to 2015 IEEE International Conference on Machine Learning and Cybernetics (ICMLC'13 to ICMLC'15)

The 2nd International Conference on Soft Computing & Machine Intelligence (ISCMI'15)

The 4th International Conference on Swarm, Evolutionary and Memetic Computing (SEMCCO' 13)

Computer Skills

Programming: Java, MATLAB, C/C++, Python, HTML, CSS

Scientific: MATLAB, OriginLab

Typography: LaTeX, LibreOffice/OpenOffice, Microsoft Office

References

Sam Kwong
Professor and Department Head, IEEE Fellow
Department of Computer Science, City University of Hong Kong
Phone: (+852) 3442-2907 | E-mail: cssamk@cityu.edu.hk

Kalyanmoy Deb
Koenig Endowed Chair Professor, IEEE Fellow
Department of Electrical and Computer Engineering, Michigan State University
Phone: (+1) 517-432-2144 | E-mail: kdeb@egr.msu.edu

Qingfu Zhang
Professor, IEEE Fellow
Department of Computer Science, City University of Hong Kong
Phone: (+852) 3442-8632 | E-mail: qingfu.zhang@cityu.edu.hk

Xin Yao
Chair Professor and Department Head, IEEE Fellow
Department of Computer Science and Engineering, Southern University of Science and Technology
School of Computer Science, University of Birmingham
Phone: (+44) 121-414-3747 | E-mail: x.yao@cs.bham.ac.uk