

# Dr. Ke Li

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Sciences  
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## 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 in Data Analytics**, School of Engineering, Mathematics and Physical Sciences, University of Exeter, Dec. 2016~present

**EPSRC 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 20 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 30 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 10 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 5 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. 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)
2. **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)
3. 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)
4. **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 10 popular article in IEEE TEVC**)
5. **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 5 popular article in IEEE TCYB**)
6. **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)
7. **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 20 popular article in IEEE TEVC**)
8. 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)
9. **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)
10. 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)
11. **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 30 popular article in IEEE TEVC**)

12. **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)
13. **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)
14. **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)
15. **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. **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, accepted for publication.
2. **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.
3. 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.
4. **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.
5. **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.
6. 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.
7. 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.
8. **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.
9. **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.

10. 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.
11. 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.
12. **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.
13. 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.
14. 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.
15. 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.
16. **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. **Ke Li**, Kalyanmoy Deb and Xin Yao, [Integration of Preferences in Decomposition-Based Evolutionary Multi-Objective Optimization](#), November, 2016.
2. Tao Chen, **Ke Li**, Rami Bahsoon and Xin Yao, [FEMOSAA: Feature Guided and Knee Driven Multi-Objective Optimization for Self-Adaptive Software at Runtime](#), August, 2016.
3. **Ke Li**, Renzhi Chen and Xin Yao, [Dynamic Multi-Objective Optimization with a Changing Number of Objectives](#), May, 2016.
4. **Ke Li** and Kalyanmoy Deb, [Performance Assessment for Preference-Based Evolutionary Multi-Objective Optimization Using Reference Points](#), January, 2016.

## Teaching Experiences

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

Introduction to Internet and Programming (CS1303), Semester B, 2012/2013

Computer Networks and Internets (CS5222), Semester A, 2012/2013

Object-Oriented Programming (CS2332), Semester B, 2011/2012

Computer Networks and Internets (CS5222), Semester A, 2011/2012

Software Engineering (CS5351), Semester B, 2010/2011

Software Quality Engineering (CS5348), Semester A, 2010/2011

## Research Grants

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

EPSRC (Grant No. EP/K001523/1) "Evolutionary Computation for Dynamic Optimisation in Network Environments", Key Member, £ 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

"[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

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

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

Joseph Billingsley (Undergraduate) at the School of Computer Science, University of Birmingham (Co-supervising with Prof. Xin Yao), Oct. 2015~Jun. 2016.

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

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

### Membership

IEEE student member, 2010~2014.

ACM professional member, 2013~present.

### Reviewer of Journals

IEEE Transactions on Evolutionary Computation

IEEE Transactions on Cybernetics

IEEE Transactions on Fuzzy Systems

IEEE Transactions on Industrial Electronics

IEEE Transactions on Knowledge and Data Engineering

IEEE Transactions on Vehicular Technology

European Journal of Operational research

Swarm and Evolutionary Computation

Frontiers of Computer Science

Information Sciences  
Expert Systems with Applications  
Computers & Operations Research  
Neurocomputing  
Memetic Computing  
Soft Computing

## Conference Program Committee/Reviewer

The 2016 IEEE Symposium Series on Computational Intelligence (SSCI'16)  
The 2014 to 2016 IEEE Congress of Evolutionary Computation (CEC'14 to CEC'16)  
The 2014 to 2016 Genetic and Evolutionary Computation Conference (GECCO'14 and GECCO'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:** L<sup>A</sup>T<sub>E</sub>X, 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 Senior Member  
Department of Computer Science, City University of Hong Kong  
School of Computer Science & Electronic Engineering, University of Essex  
Phone: (+852) 3442-8632 | E-mail: qingfu.zhang@cityu.edu.hk

### **Xin Yao**

Chair Professor, IEEE Fellow  
School of Computer Science, University of Birmingham  
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