CURRICULUM VITAE – Defeng Sun

Chair Professor of Applied Optimization and Operations Research & Head of Department
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Education

- Ph.D. in Operations Research, Chinese Academy of Sciences, P.R. China, March 1995
- M.S. in Optimization, Nanjing University, P.R. China, July 1992
- B.S. in Computational Mathematics, Nanjing University, P.R. China, July 1989

Employment History

- July 1, 2019 –, Head of Department, Department of Applied Mathematics, The Hong Kong Polytechnic University, Hong Kong, China.
- August 1, 2017 –, Chair Professor of Applied Optimization and Operations Research, Department of Applied Mathematics, The Hong Kong Polytechnic University, Hong Kong, China.
- July 2009 – July 2018, Professor, Department of Mathematics, National University of Singapore, Republic of Singapore (on leave during the 2017/18 academic year).
- August 2009 – August 2014, Deputy Director (Research), Risk Management Institute, National University of Singapore, Republic of Singapore.
- January 2008 – July 2008, Acting Deputy Director (Research), Risk Management Institute, National University of Singapore, Republic of Singapore.
- January 2006 – June 2009, Associate Professor with tenure, Department of Mathematics, National University of Singapore, Republic of Singapore.
- December 2000 – December 2005, Assistant Professor, Department of Mathematics, National University of Singapore, Republic of Singapore.
- July 1995 – December 2000, Visiting Fellow/Postdoctoral Research Associate/Australian Postdoctoral Fellow at School of Mathematics, the University of New South Wales, Australia.
- September 1990 – January 1991, Tutor at Department of Mathematics, Nanjing University, P.R. China.

Current Research Interests

- Convex Optimization: Theory, Algorithms, and GPU Acceleration
- Machine Learning & AI
- Variational Convexity and Local Monotonicity Analysis
- Statistical Optimization and Learning

Honours

- Elected as an AMS Fellow in the 2026 class by American Mathematical Society.
- Elected as an ORSC Fellow in 2024 by Operations Research Society of China.
- Awarded the RGC Senior Research Fellow 2022/23 by RGC.
- Elected as an inaugural CSIAM Fellow in 2020 by China Society for Industrial and Applied Mathematics.
- Elected as a SIAM Fellow in 2020 by Society for Industrial and Applied Mathematics.
- Awarded the triennial Beale–Orchard-Hays Prize for Excellence in Computational Mathematical Programming 2018 by the Mathematical Optimization Society, jointly with Professor Kim-Chuan Toh and Dr Liuqin Yang, for our work on SDPNAL+, a solver for large-scale semidefinite programming, at Bordeaux, France, July 2-6, 2018. The first Asian team to win it since the establishment of the award in 1985.
- Received the "Distinguished Collaborator Award" from both the Hong Kong Research Center and Huawei Noah's Ark Lab, Huawei Technologies Co. Ltd. in 2021.

- The Inaugural Distinguished Alumnus, Academy of Mathematical and System Science, Chinese Academy of Sciences, December 2024.
- Awarded the The 2022 Operations Research (OR) Application Award (Ranked No. 3 after Drs Xinyuan Zhao (BJUT) and Chao Ding (CAS)) by the OR Society of China.
- Plenary speaker for "The Seventh International Conference on Continuous Optimization (ICCOPT 2022)", Lehigh University in Bethlehem, Pennsylvania, USA, July 25–28, 2022.
- Plenary speaker at SIAM Conference on Computational Science and Engineering (CSE21), Fort Worth, Texas, USA, March 1-5, 2021.
- Co-author of the paper that won Xudong Li the Best Paper Prize for Young Researchers in Continuous Optimization 2019 in the Sixth International Conference on Continuous Optimization (ICCOPT 2019).
- Plenary speaker at SIAM Conference on Optimization (OP11), Darmstadtium Conference Center, Darmstadt, Germany, May 16–19, 2011. (One of eight plenary speakers)
- The inaugural Outstanding Scientist Award, by Faculty of Science, National University of Singapore, 2007.
- Awarded the Australian Postdoctoral Fellowship (1999–2002) by the Australian Research Council.
- Finalist in "1998 Hong Kong Young Researcher Prize for the best paper presented at the International Conference on Nonlinear Programming and Variational Inequalities", Hong Kong, 1998.
- Yilida Prize of the Chinese Academy of Sciences, 1995.
- Excellent Prize of the President of the Graduate School at the Chinese Academy of Sciences, 1994.

Services

- Services at the Hong Kong Polytechnic University
  - Head of Department (July 2019–).
  - Director, PolyU-Huawei Mathematical Optimization Innovation Laboratory (September 2025 –).
  - Director, Research Center for Intelligent Operations Research (May 2024 –).
  - Director, The PolyU-SDU Joint Research Center on Financial Mathematics (July 2018–).
  - Vice President, Operations Research Society of China (October 2024 –).
  - President, The Hong Kong Mathematical Society (May 2020 – May 2024).
  - Member of Department Staffing Committee (DSC, July 2017–), Department Management Committee (DMC, July 2017–), Department Research Committee (July 2017–); and Department Learning and Teaching Committee (July 2018–).

- Services at the National University of Singapore
  - Member (one of four) of the task force for the proposal of the new Data Science and Analytics Bachelor Program to be launched in August 2016 (successfully approved by the University in April 2016); and Program Director for proposing the Master of Data Science Program to be launched in 2017 (estimated) at National University of Singapore.
  - Acting program director to Masters of Financial Engineering, Risk Management Institute, National University of Singapore, (March–June, 2014).
  - Deputy Director (Research), Risk Management Institute, National University of Singapore, August 2009–August 2014.
  - Acting Deputy Director (Research), Risk Management Institute, National University of Singapore, January 2008–July 2008.
  - Department Research Committee (Member July 2002–July 2007 and Deputy Chair July 2004–July 2006); Department Curriculum Committee (member July 2005–July 2006); Department Teaching and Evaluation Committee (member July 2006–July 2007); Department Colloquium Committee (member January 2007–July 2008); Department Graduate Committee (member January 2007–January 2008); Department Search Committee (member July 2007–July 2008); National University of Singapore.
  - The Optimization Research Bridge (ORB), member, July 2003–present.

Professional Activities

- The 2025 ICCOPT Steering Committee of the Mathematical Optimization Society (MOS)
- Immediate Past President, The Hong Kong Mathematical Society (May 2024–)
- Organizing Committee Co-Chair and Local Organizing Committee Co-Chair, "SIAM Conference on Optimization (OP20)", The Hong Kong Polytechnic University, Hong Kong, May 2020. Rescheduled and held in July 2021 in USA due to Covid-19
- Program Committee Member, "Sixth International Conference on Continuous Optimization", Berlin, August 2019 and "Fifth International Conference on Continuous Optimization", Tokyo, August 2016
- Program Committee, "Fifth International Conference on Continuous Optimization", Tokyo, Japan, 2016
- Editorial Board (as Associate Editor): Mathematical Programming, Series A, August 2007 –
- Editorial Board (as Associate Editor): SIAM Journal on Optimization, January 2012 –
- Editorial Board (as Associate Editor): Journal of the Operations Research Society of China, 2012–
- Editorial Board (as Associate Editor): Journal of Computational Mathematics, July 2017–
- Editorial Board (as Associate Editor): Science China: Mathematics, January 2018 –
- Member of the Advisory Committee: Asia-Pacific Journal of Operational Research, January 2014–; Editor-in-Chief, October 2010 – December 2013.
- Editorial Board (as Associate Editor): Mathematical Programming, Series B, January 2014 – December 2017.
- Editorial Board (as Associate Editor): Journal of Optimization Theory and Applications, July 2021 –
- Refereeing for Journals: Mathematical Programming, Mathematics of Operations Research, SIAM Journal on Optimization, Operations Research, etc.

Memberships

- SIAM
- INFORMS
- Mathematical Optimization Society
- Singapore Mathematical Society (life member)
- Singapore Operational Research Society (life member)
- China Operations Research Society (life member)
- CSIAM (life member)
- American Mathematical Society

Research Grants as PI or Co-PI

- Director, PolyU-Huawei Mathematical Optimization Innovation Laboratory. Source: Huawei Technologies Co. Ltd. Duration: September 2025– September 2028. Amount: HK$10,500,000.00++
- Principal Investigator, "Stability analysis of the KKT solution mapping for a class of nonlinear optimization problems", Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: September 2025–August 2028. Amount: HK$890,587
- Principal Investigator, "Solving Linear Relaxation Problems of Mixed Integer Programming". Source: Huawei Technologies Co. Ltd. Duration: January 2025– January 2026. Amount: HK$1,809,650.00++
- Co-Principal Investigator, "Mechanisms and Key Technologies of Multi-Sensory Emulation Wearable Devices (MSEWD)", Source: Theme-based Research Scheme 2024/25 from the Research Grants Council, Hong Kong. Duration: 2025 – 2029. PC: Professor TAO Xiao-Ming (SFT, PolyU). Total amount: HK$ 62,378,000. (My share as the PI of a child project: HK$ 2,890,000)
- Principal Investigator, "On the strong semismoothness of the projection onto the intersection of closed convex sets and its applications", Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2025–2027. Amount: HK$910,742
- Principal Investigator, "Nonsmooth equations: Sparsity, singularity, and smoothing Newton methods", Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2024–2026. Amount: HK$877,079
- Principal Investigator, "Nonlinear Conic Programming: Theory, Algorithms and Software", Source: RGC Senior Research Fellow Scheme (2022/23). Duration: 2023–2027. Amount: HK$7,798,380

- Principal Investigator, "Solving Large Scale Degenerate Optimization Problems: From the Perspectives of the Augmented Lagrangian Method". Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2023–2025. Amount: HK$1,032,000
- Principal Investigator, "Large scale linear programming solver". Source: Huawei Technologies Co. Ltd. Duration: March 2022– June 2025. Amount: HK$2,593,324++
- Principal Investigator, "Adaptive sieving techniques for nonconvex optimization problems with applications to model compression". Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2022–2024. Amount: HK$706,015
- Principal Investigator, "Efficient sparse smoothing Newton methods with low complexities for optimal transport problems". Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2021–2023. Amount: HK$599,861
- Principal Investigator, "Fast Optimal Transport Algorithms for Communications and Networking". Source: Huawei Technologies Co. Ltd. Duration: May 2020–May 2024. Amount: HK$1,500,000++
- Principal Investigator, "Solving large scale linear programming models for production planning". Source: Huawei Technologies Co. Ltd. Duration: January 2020–June 2025. Amount: HK$3,860,217
- Principal Investigator, "Stochastic Optimal Control Theory under Model Uncertainty and Their Applications in Financial Risk Management". Source: The NSFC/RGC JRS. Duration: 2020-2023. Amount: HK$970,398
- Principal Investigator, "Efficient multi-majorization-minimization methods for multi-difference-of-convex programming". Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2020–June 2023. Amount: HK$502,444
- Principal Investigator, "Explicit finite element general contact algorithm and software development based on GPU parallel computing". Source: Research Institute of Tsinghua, Pearl River Delta, Guangzhou, China. Duration: August 2020–December 2023. Amount: HK$568,600
- Principal Investigator, "Optimization Models and Fast Algorithms for Large Scale Data Clustering Problems". Source: the Open Research Fund from Shenzhen Research Institute of Big Data, Shenzhen, China. Duration: 2019–2022. Amount: CNY1,300,000
- Principal Investigator, "Efficient Methods for Large Scale Convex Composite Optimization Problems with Double Regularizers". Source: General Research Fund (GRF) from the Research Grants Council, Hong Kong. Duration: 2019–2021. Amount: HK$304,301
- Principal Investigator, "Optimization models and algorithms for feature extractions of financial big data". Source: The Hong Kong Polytechnic University Postdoctoral Fellowships Scheme 2017 [for Xiaoliang Song]. Duration: 2018–2020. Amount: HK$695,400
- Principal Investigator, "Exploiting the Second Order Nonsmoothness to Design Efficient Methods for Large Scale Composite Optimization Problems". Source: Start-up fund from the Hong Kong Polytechnic University. Duration: 2017-2020
- Principal Investigator, "Research on Correlation Matrices in Financial Risk Management". Source: Institute of Risk Management, National University of Singapore. Duration: 2015 – 2018. Amount: SG$60,000
- Principal Investigator, "Practical Augmented Lagrangian Methods with Indefinite Proximal Terms". Source: Academic Research Fund, National University of Singapore. Duration: December 2014–December 2017. Amount: SG$141,400
- Principal Investigator (co-PI from 2015 to July 2016), "Future Resilient System Module 1.1.2 Hidden Interdependencies". Source: the Singapore-ETH Centre (SEC) funded by MOE and NRF. Duration: 2015–2019. Amount: SG$642,000
- Co-Principal Investigator, "Large Scale Convex Matrix Optimization: Theory, Algorithms, and Applications". Source: Academic Research Fund, Ministry of Education, Republic of Singapore. Duration: April 2014–March 2017. Amount: SG$592,129
- Co-Principal Investigator, "Algorithm for Design of Compliant Mechanisms". Source: SUTD-MIT International Design Center (IDC), Singapore University of Technology and Design. Duration: August 2013– July 2014. Amount: SG$99,940
- Principal Investigator, "Structured Matrix Rank Optimization Problems". Source: Academic Research Fund,

National University of Singapore. Duration: November 2011–November 2014. Amount: SG$75,126
- Principal Investigator, "Nonlinear Conic Optimization" Source: Academic Research Fund, National University of Singapore. Duration: July 2007–June 2010. Amount: SG$105,509
- Principal Investigator, "Constrained Linear Quadratic Optimal Control". Source: Academic Research Fund, National University of Singapore. Duration: July 2004–August 2007. Amount: SG$25,538
- Principal Investigator, "Newton's Method for Solving Semismooth Optimization Problems". Source: Seed Funding for Faculty of Science Research Projects, National University of Singapore. Duration: November 2001–October 2003. Amount: SG$82,484
- Principal Investigator, "Computational Methods for Constrained Nonsmooth Equations". Source: Australian Research Council (Australian Postdoctoral Fellowship Category). Duration: 3 years from 1999 to 2002. Amount: AU$150,000. A supplementary grant to the fellowship: AU$18,000. (I resigned later due to my move to NUS)

Selected Invited Conference and Workshop Presentations (Partial)

- "The International Symposium on Mathematical Programming (ISMP)", to be held at Amsterdam, Netherlands. July 25-30, 2027. Plenary.
- "The 2025 Annual Meeting of the China Society for Industrial and Applied Mathematics (CSIAM)", Changsha, China. October 23-26, 2025. Plenary.
- "The 2024 International Workshop on Modern Optimization and Applications (MOA 2024)", AMSS, Chinese Academy of Sciences, Beijing, China. June 23-25, 2024. Plenary.
- "Nonsmooth Analysis and Sparse Optimization", The 12th International Workshop on Mathematical Issues in Information Sciences (MIIS'2023), The Chinese University of Hong Kong, Shenzhen, China. December 16–17, 2023. Keynote.
- "Nonsmooth Analysis and Sparse Optimization", The Third Pacific Optimisation Conference 2023, Sunway University, Malaysia. December 9–11, 2023. Plenary.
- "Nonsmooth Analysis and Sparse Optimization", The 14th Bi-annual National Conference of Mathematical Optimization Society in China, Chengdu, China. May 12–15, 2023. Plenary.
- "Exploring the Sparsity of Large-scale Statistical Optimization Problems", The Seventh International Conference on Continuous Optimization (ICCOPT 2022), Lehigh University in Bethlehem, Pennsylvania, USA. July 25–28, 2022. Plenary.
- "Exploring the Second-order Sparsity in Sparse Statistical Optimization Problems", at the "SIAM Conference on Computational Science and Engineering (CSE21)", Fort Worth, Texas, USA, March 1-5, 2021. Plenary (held online).
- "Adaptive Sieving with PPDNA for Solving Sparse Statistical Optimization Problems", at the Annual Conference organized by RAMP (Research Association of Mathematical Programming) from The Operations Research Society of Japan, October 26-27, 2020. Plenary (held online).
- "Convex Composite Quadratic Programming: A Restricted Wolfe Dual and a Symmetric Gauss-Seidel Decomposition Theorem", at the 15th National Conference of the Operations Research Society of China, Hefei, China, October 11–18, 2020. Plenary (held online).
- "Matrix Cones and Spectral Operators of Matrices", Advances in the Geometric and Analytic Theory of Convex Cones, Sungkyunkwan University, Korea, May 27–31, 2019. Plenary.
- "Sparse Newton Methods for Large Scale Optimization Problems", Huawei Strategy and Tech workshop in Shenzhen, China, May 14th–15th 2019. Invited Machine Learning Stream Talk.
- "Sparse Semismooth Newton Methods and Big Data Composite Optimization", at the International Workshop "Variational Analysis and Related Topics", Hanoi Pedagogical University 2, Vietnam, December 13–15, 2018. Plenary.
- "New Computing-Driven Opportunities for Optimization", Wuyishan, August 17, 2018.
- "DIMACS Workshop on ADMM and Proximal Splitting Methods in Optimization", Rutgers University, June 11–13, 2018
- "A block symmetric Gauss-Seidel decomposition theorem and its applications in big data nonsmooth optimization", invited plenary talk at The Hong Kong Mathematical Society Annual General meeting 2018, May

26, 2018.
- "The Second International Conference on Optimization and Control (ICOCO2015) and the Seventh Australia-China Workshop on Optimization: Theory, Methods and Applications (ACWO2015)", Chongqing, China, December 7–10, 2015. (Keynote address).
- "International Workshop on Optimization, Sparsity, and Adaptive Data Analysis", the Morningside Mathematical Center at Chinese Academy of Sciences, Beijing, China, March 18–22, 2015.
- "The 2014 Workshop on Optimization for Modern Computation", Beijing International Center for Mathematical Research, Beijing, China, September 2–4, 2014.
- "The Second International Conference on Engineering and Computational Mathematics (ECM2013)", The Hong Kong Polytechnic University, Hong Kong, December 16–18, 2013.
- "The international conference on Jordan Theory, Analysis and Optimization", Daejeon, South Korea, May 13–17, 2013.
- "The 9th Conference of Mathematical Programming Society of China", Hangzhou, China, April 20-24, 2012. (One of nine invited plenary talks).
- "SIAM Conference on Optimization (OP11)", Darmstadtium Conference Center, Darmstadt, Germany, May 16-19, 2011. (One of eight invited plenary talks).
- "Optimization Workshop II: Numerical Methods for Continuous Optimization", IPAM, UCLA, USA, October 11 - 15, 2010.
- "2008 Workshop on Variational Inequalities and complementarity Problems", July 26, 2008, Zhongshan Hotel, Nanjing, China.
- "International School of Mathematics 'Guido Stampacchia' 46th Workshop: New Problems and Innovative Methods in Nonlinear Optimization", 31 July–9 August 2007, Erice-Sicily, Italy.
- "Workshop on Optimization", December 8–10, 2006, National Taiwan Normal University, Taipei, Taiwan.
- "Workshop on Optimization and Applications", July 9–11, 2006, Tsinghua University and Beijing Jiaotong University, China.
- "The 3rd Sino-Japanese Optimization Meeting (SJOM 2005)", October 31–November 2, 2005, Orchard Hotel, Singapore.
- "The Fourth International Conference on Complementarity Problems", August 9–12, 2005, Stanford University, USA.
- "2005 Nanjing International Conference on Scientific Computing", June 4–June 8, 2005, Nanjing Normal University, China.
- "Workshop of Optimization Theory and Its Applications (WOTA)", Chinese Academy of Sciences, Beijing, China, January 8–9, 2005.

Supervision

- Research Graduate Students at the Hong Kong Polytechnic University
  - Yijia Liang (PhD Program) January 2026 –
  - Wensen Ma (PhD Program) August 2025 – (co-supervising with Houduo Qi at DSAI)
  - Peiqi Yu (PhD Program) August 2025 –
  - Jun Xiang (joint PhD Program with USTC) September 2024 –August 2025
  - Jundan Ji (PhD Program) August/September 2024 –
  - Jiawei Lu (PhD Program) August/September 2024 –
  - Zhengyang Huang (PhD Program) August/September 2024 –
  - Qilin Lai (PhD Program) August/September 2023 –
  - Xinyu Fan (PhD Program) August/September 2022 –
  - Xiangyu Zhang (PhD Program) August/September 2022 –
  - Jiaming Ma (PhD Program) August/September 2022 –
  - Feisheng Li (PhD Program) August/September 2021 –
  - Xinman Cheng (PhD Program) August/September 2021 –
  - Wangyongquan Zhang (PhD Program) August/September 2021 –
  - Ziqi Yang (joint PhD Program with Harbin Institute of Technology, Shenzhen) August/September 2021 –

  - Hui Yan (PhD Program) January /February 2020 – December 2025.
  - Chiyu Ma (PhD Program) August/September 2020 – December 2025. Thesis Title: "A Proximal Generation based Level Set Method with Secant Iterations for the Least-Squares Constrained Nuclear Norm Minimization".
  - Kaihuang Chen (PhD Program) August/September 2020 – December 2025. Thesis Title: "Accelerated First Order Methods for Convex Composite Quadratic Programming: Theory, Algorithms, and GPU Implementation".
  - Guojun Zhang (PhD Program) August/September 2020 – December 2025. Thesis Title: "Fast Algorithms for Optimal Transport Problems: Theory, Acceleration, and Extensions".
  - Qian Li (PhD Program) January /February 2020 – March 2025. Thesis Title: "Efficient level set methods for sparse optimization problems with least-squares constraints".
- Research Fellows/Associates/Assistants (6 months or above) at the Hong Kong Polytechnic University
  - Kaihuang Chen (Postdoctoral Research Fellow; 12 months), March 2026–
  - Hao Zhang (Postdoctoral Research Fellow; 12 months), February 2026–
  - Guojun Zhang (Postdoctoral Research Fellow; 12 months), January 2026–
  - Yanming Lai (Postdoctoral Research Fellow; 12 months), August 2025–
  - Hailing Wang (Postdoctoral Research Fellow; 12 months), August 2025–
  - Shichen Liao (Postdoctoral Research Fellow; 12 months), July 2025–
  - Qian Li (Postdoctoral Research Fellow; 12 months), June 2025–
  - Bo Yang (Postdoctoral Research Fellow; 6 months), March 2025–September 2025
  - Ruoning Chen (Research Assistant; 12 months), February 2025– February 2026
  - Wei Zhao (Research Assistant; 24 months), February 2025–
  - Zhengjian Bai (Senior Research Fellow; 12 months), September 2024–August 2025
  - Weimi Zhou (Research Assistant; 12 months), August 2024–July 2025
  - Qi Wang (Postdoctoral Research Fellow; 24 months), July 2024–
  - Yan Liu (Research Fellow; 12 months), July 2024–June 2025
  - Jiahong Li (Postdoctoral Research Fellow; 24 months), July 2024–
  - Zhenting Luan (Postdoctoral Research Fellow; 24 months), August 2024–
  - Zheng Qu (Senior Research Fellow; 15 months), March 2024–June 2025
  - Jintao Xu (Postdoctoral Research Fellow; 20 months), February 2024–September 2025
  - Xixi Jia (Postdoctoral Research Fellow; 12 months), December 2023– December 2024
  - Zhechen Zhang (Research Associate; 6 months), December 2023–May 2024
  - Can Wu (Postdoctoral Research Fellow; 12 months), September 2023–September 2024
  - Shulan Zhu (Research Assistant; 6 months), August 2023–January, 2024
  - Ruoning Chen (Research Assistant; 12 months), August 2023–August 2024
  - Wei Zhao (Research Assistant; 12 months), August 2023–August 2024
  - Shuhui Liu (Postdoctoral Research Fellow; 36 months), June 2023–
  - Zhenting Luan (Research Assistant; 14 months), June 2023–July 2024
  - Yang Chen (Research Associate; 7 months), June 2023–December 2023
  - Xiaoyu Zhang (Postdoctoral Research Fellow; 12 months), April 2023–April 2024
  - Bo Yang (Research Associate; 24 months), March 2023–March 2025
  - Yan Li (Research Associate; 8 months), February 2023–September 2023
  - Zhen Zhang (Research Assistant; 6 months), April 2022–October 2022
  - Zhuoxuan Jiang (Postdoctoral Research Fellow; 30 months), November 2021–May 2024
  - Wenqiang Li (Postdoctoral Research Fellow; 12 months), September 2021–August 2022
  - Zhenzhi Qin (Research Assistant; 12 months), July 2021–July 2022
  - Yishuai Niu (Research Fellow; 12 months), December 2021–December 2022
  - Min Zhang (Postdoctoral Research Fellow; 24 months), July 2021–July 2023
  - Bo Yang (Research Assistant; 6 months), June 2021–December 2021
  - Yancheng Yuan (Postdoctoral Research Fellow; 12 months), October 2020–April 2021
  - Shengtao Cao (Postdoctoral Research Fellow; 12 months), October 2020–October 021

  - Xiaoliang Song (Postdoctoral Research Fellow; 24 months), September 2018–September 2020.
  - Ning Zhang (Postdoctoral Research Fellow), November 2018–July 2019.
  - Liang Chen (Postdoctoral Research Fellow), September 2017–September 2019
- Research Graduate Students at National University of Singapore
  - Meixia Lin (PhD program) August 2016–July 2018
  - Yancheng Yuan (PhD program) August 2015–July 2018
  - Xin Yee Lam (PhD program) August 2014–July 2018 (co-supervising with K.-C. Toh).
  - Yangjing Zhang (PhD program) August 2014–July 2018
  - Bo Chen (PhD program) August 2013–July 2018.
  - Han Guo (PhD program) August 2012– July 2017. Thesis Title: "The metric subregularity of KKT solution mappings of composite conic programming".
  - Ying Cui (PhD program) August 2011 – January 2016. Thesis Title: "Large scale composite optimization problems with coupled objective functions: theory, algorithms and applications". Her thesis is awarded the Louis Chen Hsiao Yun Best Dissertation Prize in July 2018 at the National University of Singapore.
  - Mengyu Du (PhD program) August 2010 – August 2015. Thesis Title: "An inexact alternating direction method of multipliers for convex composite conic programming with nonlinear constraints".
  - Xudong Li (PhD program) August 2010–January 2015. Thesis Title: "A two-phase augmented Lagrangian method for convex composite quadratic programming".
  - Jing Yang (master program) August 2012–August 2014. Thesis Title: "A general framework for structure decomposition in high-dimensional problems".
  - Chenglong Bao (PhD program) July 2009–August 2014 (co-supervising with Hui Ji). Thesis Title: "Sparse coding based image restoration and recognition: algorithms and analysis".
  - Bin Wu (PhD program) August 2008–January 2014. Thesis Title: "High-dimensional analysis on matrix decomposition with application to correlation matrix estimation in factor models".
  - Weimin Miao (PhD program) August 2007–January 2013. Thesis Title: "Matrix completion models with fixed basis coefficients and rank regularized problems with hard constraints".
  - Chao Ding (PhD program) August 2007– January 2012. Thesis Title: "An introduction to a class of matrix optimization problems".
  - Xiaoquan Chen (graduate program) August 2009–August 2011. Thesis Title: "A penalty method for correlation matrix problems with prescribed constraints".
  - Zhe Yang (graduate program) August 2007–August 2009. Thesis Title: "A study on nonsymmetric matrix-valued functions".
  - Yanying Luo (master student) January 2007–January 2010. Thesis Title: "A smoothing Newton-Bicgstab method for least squares matrix nuclear norm problems".
  - Yan Gao (PhD program) July 2006–August 2010. Thesis Title: "Structured low rank matrix optimization problems: A penalized approach".
  - Xinyuan Zhao (PhD program) July 2006–August 2009 (co-supervising with K C Toh). Thesis Title: "A semismooth Newton-CG augmented Lagrangian method for large scale linear and convex quadratic SDPs".
  - Yidi Chen (master student) July 2005–July 2008. Thesis Title: "An inexact SQP Newton method for convex SC1 minimization problems".
  - Zheng Zheng (master student) July 2003– May 2005. Thesis Title: "A smoothing Newton method for the boundary-valued ODEs".
  - Qi Yu (master student) July 2003–August 2005. Thesis Title: "Smoothing approximations for two classes of convex eigenvalue optimization problems".
  - Shengyuan Shi (master student) July 2002–July 2004. Thesis Title: "Smooth convex approximation and its Applications".
  - Jinye Zhao (master student) July 2002–July 2004. Thesis title: "The smoothing function of the nonsmooth matrix valued function".
- Research Fellows/Associates/Assistants at National University of Singapore
  - Liang Chen (research fellow) February 2017–July 2017 (co-supervising with K C Toh).
  - Ning Zhang (Research Fellow) June 2015–June 2017 (co-supervising with K C Toh, Huan Xu (June 2015

– August 2016))
  - Ying Cui (research assistant/associate/fellow) August 2015–July 2017 (co-supervising with K C Toh).
  - Xudong Li (research assistant/associate/fellow) February 2015–July 2017 (co-supervising with K C Toh).
  - Shenglong Hu (research fellow) September 2014–August 2015 (co-supervising with K C Toh).
  - Jia Wu (research fellow) August 2014–July 2015 (co-supervising with K C Toh).
  - Min Li (research fellow) July 2014–November 2014 (co-supervising with K C Toh).
  - Bin Wu (research associate) April 2014– (co-supervising with K C Toh).
  - Bin Wu (research assistant) August 2012–June 2013.
  - Chengjing Wang (research fellow) October 2007–June 2010 (co-supervising with K C Toh).
  - Yongjin Liu (research fellow) June 2006–January 2010 (co-supervising with K C Toh).
  - Qiaoming Han (postdoctoral fellow) 1.5 months, 2003.
  - Zhenghai Huang (postdoctoral fellow) June 2002–June 2003.

Doctoral Thesis Committees (partial)

- Andre Manfred Milzarek, Technical University of Munich, 2016.
- LE THI KHANH HIEN, Nanyang Technological University, 2015.
- Zirui Zhou, The Chinese University of Hong Kong, 2015.
- Lei Wu, Hunan University, 2013.
- Internal thesis committees after 2005 are not recorded any more.
- Joo Siong Chai, HPCES, Singapore-MIT Alliance, November 2005.
- Chee Khian Sim, Department of Mathematics, National University of Singapore, December 2004.
- Zhi Cai, HPCES, Singapore-MIT Alliance, October 2004.
- Fanwen Meng, Department of Mathematics, National University of Singapore, 2003.

Courses Taught

- Courses taught at the The Hong Kong Polytechnic University
  - AMA615 Nonlinear Optimization Methods, Semester 1, 2020/2021, at Department of Applied Mathematics, The Hong Kong Polytechnic University.
  - AMA542 Advanced Operations Research Methods (S2, 2018/2019; S2, 2019/2020), at Department of Applied Mathematics, The Hong Kong Polytechnic University.
  - AMA502 Operations Research Methods (S1, 2018/2019), at Department of Applied Mathematics, The Hong Kong Polytechnic University.
  - AMA542 Advanced Operations Research Methods (S2, 2017/2018), at Department of Applied Mathematics, The Hong Kong Polytechnic University.
- Courses taught at National University of Singapore
  - MA5243 Advanced Mathematical Programming (S1, 2016/2017), at Department of Mathematics, National University of Singapore.
  - MA4260 Stochastic Operations Research (S1, 2015/2016; S2, 2016/2017), at Department of Mathematics, National University of Singapore.
  - MA6253 Conic Programming (S2, 2014/2015; 2010), at Department of Mathematics, National University of Singapore.
  - MA4254 Discrete Optimization (S2, 2000/2001–2007/2008, 2011/2012), at Department of Mathematics, National University of Singapore.
  - MA4253 Mathematical Programming (S1, 2001/2002; S1, 2002/2003; S1, 2003/2004).
  - MA4260 Model Building in Operations Research (S2, 2001/2002; S1, 2004/2005–2006/2007), at Department of Mathematics, National University of Singapore.
  - MA5232 Modeling and Numerical Simulations (S2, 2007/2008; co-lecturer), at Department of Mathematics, National University of Singapore.

Optimization Software

- HPR-LP, HPR-QP, and HOT: open-source GPU Solvers for Linear Programming, Convex Composite Quadratic

Programming, and Optimal Transport.

- Matlab/C/R/Python codes, based on inexact semismooth Newton methods, for computing the nearest correlation matrix problems. The codes are widely used by the financial industry and have been incorporated into NAG's nearest correlation matrix library.
- SDPNAL/SDPNAL+: a MATLAB software package for large scale semidefinite programming with equality/inequality constraints and bound constraints (awarded the triennial Beale–-Orchard-Hays Prize by the Mathematical Optimization Society in 2018).
- SuiteLasso: a MATLAB suite for regression problems with generalized Lasso regularizers.
- QSDPNAL: a MATLAB software for convex quadratic semidefinite programming with inequality, equality and bound constraints.
- ConvexClustering: a MATLAB package for convex clustering.
- square-Root-PMM: A MATLAB software for square-root regression problems (GitHub).

Publications

A. Papers submitted

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[R19] Yanming Lai and Defeng Sun, "Standard transformers achieve the minimax rate in nonparametric regression with targets", arXiv:2602.20555 (February 2026).

[R18] Maojun Sun, Yifei Xie, Yue Wu, Ruijian Han, Binyan Jiang, Defeng Sun, Yancheng Yuan, and Jian Huang, "DSAEval: Evaluating Data Science Agents on a Wide Range of Real-World Data Science Problems", arXiv:2601.13591 (January 2026).

[R17] Shuhui Liu, Xintian Liu, Chenchen Mou, and Defeng Sun, "The global well-posedness for master equations of mean field games of controls", arXiv:2601.11588 (January 2026).

[R16] Zhangcheng Feng, Defeng Sun, Yancheng Yuan, and Guojun Zhang, "dHPR: A Distributed Halpern Peaceman–Rachford Method for Non-smooth Distributed Optimization Problems", arXiv:2511.10069 (November 2025).

[R15] Zheng Qu, Defeng Sun, and Jintao Xu, "Progressive bound strengthening via doubly nonnegative cutting planes for nonconvex quadratic programs", arXiv:2510.02948 (October 2025).

[R14] Ruoning Chen, Defeng Sun, and Liping Zhang, "On error bounds for rank-constrained affine matrix sets", arXiv:2510.01709 (October 2025).

[R13] Kaihuang Chen, Defeng Sun, Yancheng Yuan, Guojun Zhang, and Xinyuan Zhao, "On the relationships among GPU-accelerated first-order methods for solving linear programming", arXiv:2509.23903 (September 2025).

[R12] Jiaming Ma and Defeng Sun, "The Aubin property for generalized equations over C^2-cone reducible sets", arXiv:2509.14194 (September 2025).

[R11] Ruoning Chen, Jiaming Ma, and Defeng Sun, "On the p-order semismoothness of the metric projection onto slices of the positive semidefinite cone", arXiv:2509.03977 (September 2025).

[R10] Kaihuang Chen, Defeng Sun, Yancheng Yuan, Guojun Zhang, and Xinyuan Zhao, "HPR-QP: A dual Halpern Peaceman-Rachford method for solving large-scale convex composite quadratic programming", arXiv:2507.02470 (July 2025).

[R9] Chuan He, Zhaosong Lu, Defeng Sun, and Zhanwang Deng, "Complexity of normalized stochastic first-order methods with momentum under heavy-tailed noise", https://arxiv.org/abs/2506.11214 (June 2025).

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former Networks with Application to Regression", https://arxiv.org/abs/2504.12175 (April 2025).

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B. Papers in refereed journals

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