

Curriculum Vitae of Dr Shuzhong Zhang

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Academic & Professional Qualifications:

July 1991

Ph.D. Degree in Operations Research, Tinbergen Institute, Erasmus University, Rotterdam, The Netherlands.

July 1989 – June 1991

Ph.D. Program, Tinbergen Institute, Erasmus University, Rotterdam, The Netherlands.

July 1984 – July 1989

M.Phil. and Ph.D. Program, Fudan University, Shanghai, China.

July 1984

B.Sc. Degree in Mathematics, Fudan University, Shanghai, China.

September 1980 – July 1984

B.Sc. Program, Department of Mathematics, Fudan University, Shanghai.

Job History:

January 2002 –

Professor, Department of Systems Engineering and Engineering Management, The Chinese University of Hong Kong.

August 1999 – December 2001

Associate Professor, Department of Systems Engineering and Engineering Management, The Chinese University of Hong Kong.

September 1993 – July 1999

Lecturer, the Econometric Institute, Erasmus University, Rotterdam, The Netherlands.

July 1991 – August 1993

Lecturer, the Department of Econometrics, University of Groningen, The Netherlands.

July 1989 – June 1991

Research Assistant, Tinbergen Institute, Erasmus University, Rotterdam, The Netherlands.

November 1988 – June 1989

Visiting Scholar, Operations Research Group, Econometric Institute, Erasmus University, Rotterdam, The Netherlands.

Prizes and Awards:

The paper “Stochastic LQ Control via Semidefinite Programming” (co-authored with D.D. Yao and X.Y. Zhou), published in *SIAM Journal on Control and Optimization*, won the SIAM Outstanding Paper Prize 2003. The SIAM Outstanding Paper Prizes were introduced in 1999, and are awarded annually. Three winners were selected each year among all the papers published in the 13 SIAM journals in the three years prior to the year of the award.

The Young Researcher Award, The Chinese University of Hong Kong, 2003 (HK\$100,000).

The Vice-Chancellor’s Exemplary Teaching Award, The Chinese University of Hong Kong, 2001. (Each faculty one awardee a year).

Ranked number 6 of 40 top Dutch economists (December 1999). See:

<http://center.kub.nl/top40/1999.html>

Erasmus University Research Prize 1999 (fl. 15,000 \approx US\$ 7,500). This prize is on the whole university level (7 faculties); one awardee in the whole university each year.

Ph.D. dissertation won runner-up prize for *the 1991 TIMS College On Location Analysis best dissertation award*.

Honorary Affiliations:

Affiliated Member, Center for Optimization and Applications, Chinese Academy of Sciences, Beijing, China (2009 –).

Distinguished Honorary Professor, School of Management, Fudan University, Shanghai, China (2008 – 2010).

Honorary Dean, School of Management, China University of Mining and Technology, Xuzhou, China (2003 – 2006).

Member of the Chair Professor Team, Tsinghua University (2009 – 2010).

Adjunct Professor, Shanghai University of Finance and Economics (2009 – 2012).

Adjunct Professor at School of Science, Beijing University of Posts and Telecommunications, Beijing, China (2007 –).

Adjunct Professor at School of Management Sciences, Fudan University, Shanghai, China (2002 – 2008).

Adjunct Professor at School of Sciences, Shanghai University, China (1997 –).

Research Fellow of the Thomas Stieltjes Institute for Mathematics, The Netherlands (1999 – 2000).

Research Fellow of the TRAIL Research School, The Netherlands (1994 – 2000).

Research Fellow of the Tinbergen Institute, The Netherlands (1994 – 2000).

Research Interests:

Methodologies: Optimization; Operations Research.

Applications: Financial Engineering; Engineering Management; Signal Processing.

Courses Taught:

- *Summer Course on Optimization*, Harbin, 2009; The Chinese Math Prog Society.
- *Dynamic Optimization and Applications* (SEG3470); CUHK
- *Conic Optimization and Applications* (SEG5660); CUHK
- *Engineering Economics in E-Commerce Technologies* (ECT7230); CUHK
- *Computational Finance* (SEG7570); CUHK
- *Optimization I* (SEG5520); CUHK
- *Engineering Economics* (SEG2440); CUHK
- *Asset Pricing Models* (SEG5120); CUHK

- *Special Topics in Systems Engineering & Engineering Management* (SEG4580); CUHK
- *Semidefinite Programming* (Ectrie Capita Selecta B); Erasmus University
- *Linear and Nonlinear Programming* (MaBes 1); Erasmus University
- *Quantitative Techniques in Finance* (A7325); Erasmus University
- *Advanced Linear Programming*; Erasmus University
- *Linear Programming*; University of Groningen
- *Mathematical Modeling* (with C. Schweigman *et al.*); University of Groningen
- *Introduction to Primal-Dual Interior Point Methods*; University of Groningen

Postgraduate Students Supervision:

SUPERVISION OF DOCTORAL STUDENTS:

- *At the Chinese University of Hong Kong:*

HE Simai.

Title of the dissertation: Aspects of the bridge between optimization and game theory.

Date of the Ph.D. thesis defence: June 19, 2009.

CHEN Li.

Title of the dissertation: Risk measures, robust portfolios, and other minimax models.

Date of the Ph.D. thesis defence: June 27, 2008.

XIE Jiang.

Title of the dissertation: Constrained portfolio selection via high performance optimization techniques.

Date of the Ph.D. thesis defence: June 15, 2006.

HUANG Yongwei.

Title of the dissertation: Complex quadratic optimization via semidefinite programming: models and applications.

Date of the Ph.D. thesis defence: August 18, 2005.

WANG Xiao Qing; (co-supervision with David D. Yao).

Title of the dissertation: Theory and algorithms for separated continuous linear programming and its extensions.

Date of the Ph.D. thesis defence: July 22, 2005.

LIANG Jian Feng; completed in 2004 (co-supervision with Duan Li).

Title of the dissertation: Optioned portfolio selection: models, analysis, & solution methods.

Date of the Ph.D. thesis defence: July 15, 2004.

LI Zhening; started in August 2007.
 WANG Xiaoguo; started in August 2007.
 JIANG Bo; started in August 2008.
 WANG Kuncheng (co-supervision with Anthony SO); started in August 2008.
 CHEN Bilian; started in September 2009.
 LI Xin; started in September 2009.
 WONG Manhang; started in September 2009.
 HE Hongzhi (co-supervision with Frank Chen); started July 2009.

- At Erasmus University:

J.F. Sturm

Title of the dissertation: Primal-dual interior point approach to semidefinite programming.

Date of the Ph.D. defence: September 11, 1997.

Jos Sturm was the father of the famous general SDP solver known as SeDuMi. Jos' Ph.D. dissertation received the "Gijs de Leve Prize" (Best Ph.D. Thesis in OR & Management Science in The Netherlands) in January 2000 for 1997-1999. The prize is awarded to one recipient in the whole country every three years.

SUPERVISION OF MASTER STUDENTS:

- At the Chinese University of Hong Kong:

WONG Manhong; completed in 2006.

Subject: Investment models based on clustered scenario trees.

SHEN Ruijun; completed in 2005.

Subject: Robust portfolio selection based on a multi-stage scenario tree.

CHEN Li; completed in 2004.

Subject: Portfolio selection under downside risk measure and distributional uncertainties.

CHENG Tak Wai; completed in 2003.

Subject: On implementation of a self-dual embedding method for convex programming.

YU Lian; completed in 2003 (co-supervision with Xunyu Zhou).

Subject: A downside risk analysis based on financial index tracking models.

LAM Sze Wan; completed in 2002 (co-supervision with Duan Li).

Subject: Value estimation in the Iri-Imai method for convex programming.

LEE Sung Tak; completed in 2001.

Subject: Sensitivity analysis for linear programming based on interior point methods.

- At Erasmus University:
 - Spencer Stots; completed in 2002.
Subject: Decomposition methods in stochastic programming.
 - Q.J.M. van Bijsterveldt; completed in 1997.
Subject: Combining transport flows: a case analysis of Unilever in France.
 - M. van Erkel; completed in 1996.
Subject: A network flow approach to a hard combinatorial problem.
 - M. Leenders; completed in 1996.
Subject: Affine scaling subgradient method for the min-max problems.
 - Y. Lont; completed in 1995 (co-supervision with R. Dekker).
Subject: A container allocation problem in the harbor of Rotterdam.
 - S.A. Bouwhuis; completed in 1995 (co-supervision with B. Manderick).
Subject: Heuristics for the quadratic assignment problem.
 - W.J. Jansen; completed in 1994 (co-supervision with N. Piersma).
Subject: Vehicle routing problem.
- At University of Groningen:
 - J.F. Sturm; completed in 1993.
Subject: Interior point methods.
 - S. Goverse; completed in 1993.
Subject: Fractional programming.
 - J. Doornbos; completed in 1992.
Subject: On train scheduling problems (a project at the Dutch railway company).
 - A. ten Have; completed in 1992.
Subject: An airplane landing problem.

Research Projects and Grants since 2000:

- Principal Investigator, *Multivariate Quartic Polynomial Optimization: Approximation Algorithms and Applications*, RGC Earmarked Grant (CUHK419409). Duration: 01-01-2010 to 31-12-2012. Grant amount: HK\$ 633,600.
- Co-Investigator, (with Wenbao Ai), *Theory and Global Numerical Solution Methods for Nonconvex Quadratic Optimization with Quadratic Constraints*, National Science Foundation of China (10971017). Duration: 01-01-2010 to 31-12-2012. Grant amount: RMB 260,000.

- Principal Investigator, *Optimization Models and Algorithms for Dynamic Spectrum Management*, RGC Earmarked Grant (CUHK419208). Duration: 01-01-2009 to 31-12-2010. Grant amount: HK\$ 358,660.
- Co-Investigator, (with K. Ma and P.C. Ching), *Multi-Channel Detection and Estimation Using Conic Optimization*, RGC Earmarked Grant (CUHK415908). Duration: 01-08-2008 to 31-07-2010. Grant amount: HK\$ 357,279.
- Co-Investigator, (with Y.Q. Bai *et al.*), *Symmetric Cone Programming and Its Applications in the Coding Theory*, National Science Foundation of China (10771133). Duration: 01-01-2008 to 31-12-2010. Grant amount: RMB 230,000.
- Principal Investigator, *Applications of Randomization Methods in Engineering Management*, RGC Direct Allocation (ID: 2050419). Duration: 01-01-2008 to 31-12-2009. Grant amount: HK\$ 91,166.
- Principal Investigator, *Convex Matrix Programming: Models and Solution Methods*, RGC Earmarked Grant (CUHK418406). Duration: 01-01-2007 to 31-12-2009. Grant amount: HK\$ 534,000.
- Principal Investigator, *Applications of Complex Semidefinite Programming*, RGC Earmarked Grant (CUHK418505). Duration: 01-01-2006 to 31-12-2008. Grant amount: HK\$ 538,836.
- Principal Investigator, *Continuous Linear Programming – Computational and Control Perspectives*, (with D.D. Yao and X.Y. Zhou), RGC Earmarked Grant (CUHK4242/04E). Duration: 01-01-2005 to 31-12-2007. Grant amount: HK\$ 506,447.
- Principal Investigator, *Nonnegative Mappings and Its Applications in Robust Optimization*, RGC Earmarked Grant (CUHK4174/03E). Duration: 01-10-2003 to 30-09-2006. Grant amount: HK\$ 827,632.
- Principal Investigator, *Primal-Dual Interior Point Approach to Multiple Stage Stochastic Programming*, RGC Earmarked Grant (CUHK4233/01E). Duration: 01-10-2001 to 30-09-2004. Grant amount: HK\$ 580,873.
- Principal Investigator, *Conic Optimization: Theory and Methods*, RGC Earmarked Grant (CUHK4181/00E). Duration: 01-10-2000 to 30-09-2003. Grant amount: HK\$ 437,817.
- Co-Investigator, *Linear Quadratic Control via Semidefinite Programming, with Applications*, (with D.D. Yao and X.Y. Zhou), RGC Earmarked Grant (CUHK4175/00E). Duration: 01-10-2000 to 30-09-2003. Grant amount: HK\$ 635,817.
- Principal Investigator, Summer Research Project (97000.08/00.1125/phvd), Trustfonds, Erasmus University Rotterdam. Duration: 2001 to 2003. Grant amount: NLG 30,000 (\approx US\$ 15,000).

- Principal Investigator, *Sensitivity Analysis and High Performance Optimization Methods*, Direct Grant (ID 2050238), Engineering Faculty, The Chinese University of Hong Kong. Duration: 01-12-1999 to 30-11-2001. Grant amount: HK\$ 150,000.
- Co-Investigator, *High Performance Optimization Techniques*. NWO (Netherlands Organization of Sciences) Grand Research Project (in cooperation with TU Delft, TU Eindhoven and University of Utrecht). Duration: 1997 to 2000. Total grant amount: NLG 800,000 (\approx EURO 400,000).

OR Consulting:

One of the founding members/chief advisors for OptChina — an Operations Research consulting company based in Beijing, China.

Publications:

Refereed Journal Papers

1. Y.W. Huang and S. Zhang, *Approximation Algorithms for Indefinite Complex Quadratic Maximization Problems*, Technical Report SEEM2005-03, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2005. To appear in *Science in China Series A*.
2. Z.Q. Luo, W.K. Ma, A.M.C. So, Y. Ye, and S. Zhang, *Nonconvex Quadratic Optimization, Semidefinite Relaxation, and Applications*. To appear in *IEEE Signal Processing Magazine*.
3. Z.Q. Luo and S. Zhang, *A Semidefinite Relaxation Scheme for Multivariate Quartic Polynomial Optimization With Quadratic Constraints*, Technical Report SEEM2008-06, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2008. To appear in *SIAM Journal on Optimization*.
4. A. De Maio, S. De Nicola, Y. Huang, D.P. Palomar, S. Zhang and A. Farina, *Code Design for Radar STAP via Optimization Theory*, Technical Report SEEM2009-04, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2009. To appear in *IEEE Transactions on Signal Processing*.
5. W. Ai, Y.W. Huang, and S. Zhang, *New Results on Hermitian Matrix Rank-One Decomposition*, Technical Report SEEM2008-04, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2008. To appear in *Mathematical Programming*.

6. S. He, J. Zhang, S. Zhang, *Bounding Probability of Small Deviation: A Fourth Moment Approach*, Technical Report SEEM2007-09, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2007. To appear in *Mathematics of Operations Research*.
7. L. Chen, S. He, and S. Zhang, *When all risk-adjusted performance measures are the same: In praise of the Sharpe ratio*, Technical Report SEEM2008-05, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2008. To appear in *Quantitative Finance*.
8. Z.Q. Luo and S. Zhang, *Duality Gap Estimation and Polynomial Time Approximation for Optimal Spectrum Management*, *IEEE Transactions on Signal Processing*, 57 (7), 2675 – 2689, 2009.
9. X.Q. Wang, S. Zhang, and D.D. Yao, *Separated Continuous Conic Programming: Strong Duality and an Approximation Algorithm*, *SIAM Journal on Control and Optimization*, 48 (4), 2118 – 2138, 2009.
10. W. Ai and S. Zhang, *Strong Duality for the CDT Subproblem: A Necessary and Sufficient Condition*, *SIAM Journal on Optimization*, 19 (4), 1735 – 1756, 2009.
11. A. De Maio, S. De Nicola, Y.W. Huang, Z.Q. Luo, and S. Zhang, *Design of Phase Codes for Radar Performance Optimization With a Similarity Constraint*, *IEEE Transactions on Signal Processing*, 57 (2), 610 – 621, 2009.
12. A. De Maio, S. De Nicola, Y.W. Huang, S. Zhang, and A. Farina, *Adaptive Detection and Estimation in the Presence of Useful Signal and Interference Mismatches*, *IEEE Transactions on Signal Processing*, 57 (2), 436 – 450, 2009.
13. S.I. Birbil, J.B.G. Frenk, J. Gromicho, and S. Zhang, *An Integrated Approach to Single-Leg Airline Revenue Management: The Role of Robust Optimization*, *Management Science*, 55 (1), 148 – 163, 2009.
14. W. Ai, Y.W. Huang, and S. Zhang, *On the Low Rank Solutions for Linear Matrix Inequalities*, *Mathematics of Operations Research*, 33 (4), 965 – 975, 2008.
15. A. De Maio, S. De Nicola, Y.W. Huang, S. Zhang, and A. Farina, *Code Design to Optimize Radar Detection Performance Under Accuracy and Similarity Constraints*, *IEEE Transactions on Signal Processing*, 56 (11), 5618 – 5629, 2008.
16. J.F. Liang, S. Zhang and D. Li, *Optioned Portfolio Selection: Models and Analysis*, *Mathematical Finance*, 18 (4), 569 – 593, 2008.

17. Z.Q. Luo and S. Zhang, *Dynamic Spectrum Management: Complexity and Duality*, IEEE Journal of Selected Topics in Signal Processing (Special Issue on: Signal Processing and Networking for Dynamic Spectrum Access), 2 (1), 57 – 73, 2008.
18. S. He, Z.Q. Luo, J. Nie, S. Zhang, *Semidefnite Relaxation Bounds for Indefinite Homogeneous Quadratic Optimization*, SIAM Journal on Optimization, 19, 503 – 523, 2008.
19. R.J. Shen and S. Zhang, *Robust Portfolio Selection Based on a Multi-stage Scenario Tree*, European Journal of Operational Research, 191, 864 – 887, 2008.
20. J. Brinkhuis and S. Zhang, *A D-Induced Duality and Its Applications*, Mathematical Programming, 114, 149 – 182, 2008.
21. J. Xie, S. He, S. Zhang, *Randomized Portfolio Selection, with Constraints*, Pacific Journal of Optimization, 4, 89 – 112, 2008.
22. D. Xu and S. Zhang, *An Improved Approximation Algorithm for the Uncapacitated Facility Location Problem with Service Installation Costs*, Operations Research Letters, 36, 46 – 50, 2008.
23. D. Xu and S. Zhang, *Approximation Bounds for Quadratic Maximization with Semidefnite Programming Relaxation*, Science in China Series A, 50, 1583 – 1596, 2007.
24. Z.Q. Luo, N.D. Sidiropoulos, P. Tseng, and S. Zhang, *Approximation Bounds for Quadratic Optimization with Homogeneous Quadratic Constraints*, SIAM Journal on Optimization, 18, 1 – 28, 2007.
25. Y.W. Huang and S. Zhang, *Complex Matrix Decomposition and Quadratic Programming*, Mathematics of Operations Research, 32, 758 – 768, 2007.
26. D.D. Yao, S. Zhang and X.Y. Zhou, *Tracking a Financial Benchmark Using a Few Assets*, Operations Research, 54, 232 – 246, 2006.
27. S. Zhang and Y.W. Huang, *Complex Quadratic Optimization and Semidefnite Programming*, SIAM Journal on Optimization, 16, 871 – 890, 2006.
28. T.W. Cheng and S. Zhang, *On Implementation of a Self-Dual Embedding Method for Convex Programming*, Optimization Methods and Software, 21, 75 – 103, 2006.
29. W. Ai and S. Zhang, *An $O(\sqrt{n}L)$ Iteration Primal-Dual Path-Following Method, Based on Wide Neighborhoods and Large Updates, for Monotone LCP*, SIAM Journal on Optimization, 16, 400 – 417, 2005.

30. A. Berkelaar, J. Gromicho, R. Kouwenberg and S. Zhang, *A Primal-Dual Decomposition Algorithm for Multistage Stochastic Convex Programming*, *Mathematical Programming*, 104, 153 – 177, 2005.
31. X.D. Ji, S.S. Zhu, S.Y. Wang, S. Zhang, *A Stochastic Linear Goal Programming Approach to Multistage Portfolio Management based on Scenario Generation via Linear Programming*. *IIE Transactions*, 37, 957 – 969, 2005.
32. S.W. Lam, D. Li and S. Zhang, *A Value Estimation Approach to the Iri-Imai Method for Constrained Convex Optimization*, *Journal of Optimization Theory and Applications*, 125, 591 – 608, 2005.
33. S.I. Birbil, S.C. Fang, J.B.G. Frenk and S. Zhang, *Recursive Approximation of the max Function*, *Operations Research Letters*, 33, 450 – 458, 2005.
34. B. Chen, K. Madsen and S. Zhang, *On Characterization of Quadratic Splines*, *Journal of Optimization Theory and Applications*, 124, 93 – 111, 2005.
35. S. Zhang, *A New Self-Dual Embedding Method for Convex Programming*, *Journal of Global Optimization*, 29, 479 – 496, 2004.
36. Z.Q. Luo, J.F. Sturm and S. Zhang, *Multivariate Nonnegative Quadratic Mappings*, *SIAM Journal on Optimization*, 14, 1140 – 1162, 2004.
37. D.D. Yao, S. Zhang and X.Y. Zhou, *Stochastic Linear-Quadratic Control via Semidefinite Programming*, *SIAM Review*, 46, 87 – 111, 2004.
38. Y. Ye and S. Zhang, *New Results on Quadratic Minimization*, *SIAM Journal on Optimization*, 14, 245 – 267, 2003.
39. J.F. Sturm and S. Zhang, *On Cones of Nonnegative Quadratic Functions*, *Mathematics of Operations Research*, 28, 246 – 267, 2003.
40. A. Berkelaar, C. Dert, B. Oldenkamp, S. Zhang, *A Primal-Dual Decomposition-Based Interior Point Approach to Two-Stage Stochastic Linear Programming*, *Operations Research*, 50, 904 – 915, 2002.
41. A.G. Holder, J.F. Sturm, and S. Zhang, *Marginal and Parametric Analysis of the Central Optimal Solution*, *Information Systems and Operations Research*, 39, 394 – 415, 2001.
42. S. Zhang, *A Note on a Profit Maximizing Location Model*, *Annals of Operations Research*, 103, 251 – 260, 2001.

43. D.D. Yao, S. Zhang and X.Y. Zhou, *Stochastic LQ Control via Semidefinite Programming*, SIAM Journal on Control and Optimization, 40, 801 – 823, 2001.
44. D.D. Yao, S. Zhang and X.Y. Zhou, *A Primal-Dual Semidefinite Programming Approach to Linear Quadratic Control*, IEEE Transactions on Automatic Control, 46, 1442 – 1447, 2001.
45. J.F. Sturm and S. Zhang, *On Sensitivity of Central Solutions in Semidefinite Programming*, Mathematical Programming, 90, 205 – 227, 2001.
46. Z.Q. Luo, J.F. Sturm and S. Zhang, *Conic Convex Programming and Self-Dual Embedding*, Optimization Methods and Software, 14, 169 – 218, 2000.
47. J.F. Sturm and S. Zhang, *On Weighted Centers for Semidefinite Programming*, European Journal of Operational Research, 126, 391 – 407, 2000.
48. S. Zhang, *Quadratic Maximization and Semidefinite Relaxation*, Mathematical Programming, 87, 453 – 465, 2000.
49. S. Zhang, *Global Error Bounds for Convex Conic Problems*, SIAM Journal on Optimization, 10, 836 – 851, 2000.
50. Z.Q. Luo and S. Zhang, *On Extensions of the Frank-Wolfe Theorems*, Computational Optimization and Applications, 13, 87 – 110, 1999.
51. J. Csirik, J.B.G. Frenk, M. Labbé and S. Zhang, *Two Simple Algorithms for Bin Covering*, ACTA Cybernetica, 14, 13 – 25, 1999.
52. S. Zhang, *New Variants of Finite Criss-Cross Pivot Algorithms for Linear Programming*, European Journal of Operational Research, 116, 607 – 614, 1999.
53. A.B. Berkelaar, J.F. Sturm and S. Zhang, *Polynomial Primal-Dual Cone Affine Scaling for Semidefinite Programming*, Applied Numerical Mathematics, 29, 317 – 333, 1999.
54. J.F. Sturm and S. Zhang, *Symmetric Primal-Dual Path Following Algorithms for Semidefinite Programming*, Applied Numerical Mathematics, 29, 301 – 315, 1999.
55. J.B.G. Frenk, J.F. Sturm and S. Zhang, *An Interior-Point Based Subgradient Method for Non-differentiable Convex Programming*, Optimization Methods and Software, 10, 197 – 215, 1998.
56. J.F. Sturm and S. Zhang, *On the Long Step Path-Following Method for Semidefinite Programming*, Operations Research Letters, 22, 145 – 150, 1998.
57. J.A.A. van der Veen, G.J. Woeginger and S. Zhang, *Sequencing Jobs that Require Common Resources on a Single Machine: A Solvable Case of the TSP*, Mathematical Programming, 82, 235 – 254, 1998.

58. J.F. Sturm and S. Zhang, *An Interior Point Method, Based on Rank-one Updates, for Linear Programming*, *Mathematical Programming*, 81, 77 – 87, 1998.
59. Z.Q. Luo, J.F. Sturm and S. Zhang, *Superlinear Convergence of a Symmetric Primal-Dual Path Following Algorithm for Semidefinite Programming*, *SIAM Journal on Optimization*, 8, 59 – 81, 1998.
60. J.F. Sturm and S. Zhang, *On a Wide Region of Centers and Primal-Dual Interior Point Algorithms for Linear Programming*, *Mathematics of Operations Research*, 22, 408 – 431, 1997.
61. J.A.A. van der Veen and S. Zhang, *Low-Complexity Algorithms for Sequencing Jobs with a Fixed Number of Job-Classes*, *Computers and Operations Research*, 23, 1059 – 1067, 1996.
62. J.F. Sturm and S. Zhang, *New Complexity Results for the Iri-Imai Method*, *Annals of Operations Research*, 62 (Special Volume on Interior Point Methods), 539 – 564, 1996.
63. J.F. Sturm and S. Zhang, *An $\mathcal{O}(\sqrt{n}L)$ Iteration Bound Primal-Dual Cone Affine Scaling Algorithm for Linear Programming*, *Mathematical Programming*, 72, 177 – 194, 1996.
64. A.I. Barros, J.B.G. Frenk, S. Schaible and S. Zhang, *A New Algorithm for Generalized Fractional Programs*, *Mathematical Programming*, 72, 147 – 175, 1996.
65. J.B.G. Frenk, J. Gromicho and S. Zhang, *General Models in Min-Max Continuous Location: Checking Optimality Conditions*, *Journal of Optimization Theory and Applications*, 89, 39 – 63, 1996.
66. J.B.G. Frenk, J. Gromicho and S. Zhang, *General Models in Min-Max Continuous Location: Theory and Solution Techniques*, *Journal of Optimization Theory and Applications*, 89, 65 – 87, 1996.
67. A.I. Barros, J.B.G. Frenk, S. Schaible and S. Zhang, *Using Duality to Solve Generalized Fractional Programming Problems*, *Journal of Global Optimization*, 8, 139 – 170, 1996.
68. J.F. Sturm and S. Zhang, *A Potential Reduction Method for Harmonically Convex Programming*, *Journal of Optimization Theory and Applications*, 84, 181 – 205, 1995.
69. J.B.G. Frenk, M.T. Melo and S. Zhang, *A Weiszfeld Method for a Generalized L_p Distance Minisum Location Model in Continuous Space*, *Location Science*, 2, 111 – 127, 1994.
70. S. Zhang, *Convergence Property of the Iri-Imai Algorithm for Some Smooth Convex Programming Problems*, *Journal of Optimization Theory and Applications*, 82, 121 – 138, 1994.
71. J.B.G. Frenk, M. Labbé and M. van Vliet and S. Zhang, *Improved Algorithms for Machine Allocation in Manufacturing Systems*, *Operations Research*, 42, 523 – 530, 1994.

72. J.B.G. Frenk, M.T. Melo, S. Zhang, *The Weiszfeld Method in Single Facility Location*, Portuguese Journal on Operations Research, 14, 35 – 59, 1994.
73. C. Schweigman and S. Zhang, *The Teachings of Hua Loo-Keng: A Challenge Today? The Mathematical Intelligencer*, 16, 36 – 46, 1994.
74. J.B.G. Frenk, J. Gromicho and S. Zhang, *A Deep Cut Ellipsoid Algorithm for Convex Programming: Theory and Applications*, Mathematical Programming, 63, 83 – 108, 1994.
75. T. Terlaky and S. Zhang, *Pivot Rules for Linear Programming: A Survey on Recent Theoretical Developments*, Annals of Operations Research, 46, 203 – 233, 1993.
76. J.B.G. Frenk, M. Labbé and S. Zhang, *A Note on a Stochastic Location Problem*, Operations Research Letters, 13, 213 – 214, 1993.
77. J. Csirik, J.B.G. Frenk, M. Labbé, S. Zhang, *Heuristics for the 0-1 Min-Knapsack Problem*, ACTA Cybernetica, 10, 15 – 20, 1991.
78. S. Zhang, *On Anti-Cycling Pivoting Rules of the Simplex Method*, Operations Research Letters, 10, 189 – 192, June 1991.
79. J. Csirik, J.B.G. Frenk, M. Labbé and S. Zhang, *On the Multi-dimensional Bin Packing Problem*, ACTA Cybernetica, 9, 361 – 369, 1990.

Edit Books and Refereed Book Chapters

1. Y. Huang, A. De Maio, and S. Zhang, *Semidefinite Programming, Matrix Decomposition, and Radar Code Design*. In D.P. Palomar and Y.C. Eldar eds., *Convex Optimization in Signal Processing and Communications*, Cambridge University Press, to appear.
2. C. Papadimitriou and S. Zhang (eds.), *Internet and Network Economics*, Lecture Notes in Computer Science 5385, Springer, 2008.
3. L. Yu, S. Zhang and X.Y. Zhou, *A Downside Risk Analysis based on Financial Index Tracking Models*. In M.R. Grossinho, A.N. Shiryaev, M.L. Esquivel and P.E. Oliveira eds., *Stochastic Finance*, Springer, 213 – 236, 2006.
4. M.Y. Yue (editor), J.Y. Han, L. Zhang and S. Zhang (co-editors), *Proceedings of the International Conference on Mathematical Programming (December 19 – 22, 2002)*, Shanghai University Press, Shanghai, 2004.

5. J. Brinkhuis and S. Zhang, *A D-Induced Duality and Its Applications*, In M.Y. Yue (ed.), J.Y. Han, L. Zhang and S. Zhang (co-eds.), *Proceedings of the International Conference on Mathematical Programming*, Shanghai University Press, 112 – 123, 2004.
6. S. Zhang, *A Primal-Dual Interior Point and Decomposition Approach to Multi-stage Stochastic Programming*. In D.D. Yao, H. Zhang, and X.Y. Zhou eds, *Stochastic Models and Optimization*, Springer-Verlag, Chapter 5, 137 – 170, 2003.
7. D.D. Yao, S. Zhang and X.Y. Zhou, *Linear Quadratic Control Revisited: A View Through Semidefinite Programming*. In W. Gong and L. Shi eds, *Modeling, Control and Optimization of Complex Systems (in honor of Professor Yu-Chi Ho)*, Kluwer, Chapter 9, 195 – 235, 2002.
8. J.B.G. Frenk, K. Roos, T. Terlaky and S. Zhang (eds.), *High Performance Optimization Techniques*, Kluwer Academic Publishers, 1999.
9. J.F. Sturm and S. Zhang, *A Dual and Interior Point Approach to Solve Convex Min-Max Problems*. In D.-Z. Du and P.M. Pardalos eds. *Minimax and Its Applications*, Kluwer, 69 – 78, 1995.
10. S. Zhang, *On the Strictly Complementary Slackness Relation in Linear Programming*. In D.-Z. Du and J. Sun eds., *Advances in Optimization and Approximation*, Kluwer, 347 – 361, 1994.
11. J.B.G. Frenk, J. Gromicho, F. Plastria and S. Zhang, *A Deep Cut Ellipsoid Algorithm and Quasi-convex Programming*. In S. Komlósi, T. Rapcsák and S. Schaible eds., *Lecture Notes in Economics and Mathematical Systems 405*, (Proceedings of the Fourth International Workshop on Generalized Convexity), 62 – 76 , Springer-Verlag, 1994.
12. S. Zhang, *Stochastic Queue Location Problems*, Tinbergen Institute Research Series 14, Thesis Publishers, Amsterdam, 1991.

Refereed Conference Proceedings

1. S. De Nicola, Y. Huang, A. De Maio, S. Zhang and A. Farina, *Code Optimization with Similarity and Accuracy Constraints*, *Proceedings of IEEE Radar Conference*, Rome Italy, 414 – 419, 2008.
2. Z.Q. Luo, G.B. Giannakis, S. Zhang, *Optimal Linear Decentralized Estimation in a Bandwidth Constrained Sensor Network*, *Proceedings International Symposium on Information Theory*, 1441 – 1445, 2005.
3. D.D. Yao, S. Zhang and X.Y. Zhou, *Linear Quadratic Control via Semi-Definite Programming*, *Proceedings of IEEE 38th Conference on Decision and Control*, 1027 – 1033, 1999.

4. J.B.G. Frenk, M.T. Melo, S. Zhang, *Convergence of the Weiszfeld Method for Solving Single Facility Continuous Space Location Models*, Proceedings of VI Euro Working Group on Locational Analysis, 97 – 104, 1992.
5. J.B.G. Frenk, J. Gromicho and S. Zhang, *General Models in min-max Planar Location*, Proceedings of VI Euro Working Group on Locational Analysis, 87 – 95, 1992.

Papers Submitted for Publication

1. S. He, Z. Li, and S. Zhang, *Approximation Algorithms for Homogeneous Polynomial Optimization with Quadratic Constraints*, Technical Report SEEM2009-05, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2009.
2. L. Chen, S. He, and S. Zhang, *Tight Bounds for Some Risk Measures, with Applications to Robust Portfolio Selection*, Technical Report SEEM2009-02, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2009.
3. S. He, J. Zhang, S. Zhang, *Polymatroid Optimization, Submodularity, and Joint Replenishment Games*, Technical Report SEEM2008-07, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2008.

Unpublished Technical Reports

1. J. Brinkhuis, Z.Q. Luo, and S. Zhang, *Matrix Convex Functions With Applications to Weighted Centers for Semidefinite Programming*, Technical Report SEEM2005-06, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2005.
2. *Solving Generalized Fractional Programming with Applications*, Technical Report SEEM2004-2, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2004 (with S.I. Birbil, J.B.G. Frenk).
3. *On Conically Ordered Convex Programs*, Technical Report SEEM2003-09, Department of Systems Engineering & Engineering Management, The Chinese University of Hong Kong, 2003.
4. *Duality Results for Conic Convex Programming*, Report 9719/A, Econometric Institute, Erasmus University Rotterdam, 1997 (with Z.Q. Luo and J.F. Sturm).
5. *On Purchase Timing Models in Marketing*, Report 9720/A, Econometric Institute, Erasmus University Rotterdam, 1997 (with J.B.G. Frenk).

6. *Duality and Self-Duality for Conic Convex Programming*, Report 9620/A, Econometric Institute, Erasmus University Rotterdam, 1996 (with Z.Q. Luo and J.F. Sturm).
7. *Quasiconvex Functions: How to Separate, If You Must!* Report 9425/A, Econometric Institute, Erasmus University Rotterdam, 1994 (with J.B.G. Frenk and J. Gromicho).
8. *Convex Exact Penalty Functions, Space Dilation and Linear Programming*, Research Memorandum No. 524, Institute of Economic Research, University of Groningen, 1993 (with L. Zhang).
9. *The Simplex Method for Some Special Problems*, Research Memorandum No. 442, Institute of Economic Research, University of Groningen, 1991.
10. *Fast Algorithms for Dual Bin Packing*, Report 9022/A, Erasmus University Rotterdam, 1990 (with J. Csirik, J.B.G. Frenk and M. Labbé).
11. *On Some Dominance Results in Scheduling*, Report 9018/A, Erasmus University Rotterdam, 1990 (with J. Birge, J. Csirik, J.B.G. Frenk and A. Koolen).
12. *The Stochastic k -Priority Queue Location Problem*, Report 8951/A, Erasmus University Rotterdam, 1989 (with J.B.G. Frenk and M. Labbé).
13. *The Stochastic Queue Location Problem in the Plane*, Report 8948/A, Erasmus University Rotterdam, 1989 (with J.B.G. Frenk, M. Labbé and R. Visscher).
14. *On the Convergence Property of Iri-Imai's Method for Linear Programming*, Report 8917/A, Erasmus University Rotterdam, 1989.
15. *On Vertices Adjacency Characterization and Optimization of Polymatroids*, Report 8916/A, Erasmus University Rotterdam, 1989.

Services and Professional Activities:

- Professional Societal Services:

- Vice President of The Operations Research Society of China (ORSC) (2008 –).
- Mathematical Programming Society (MPS) Council Member at Large (2006 – 2009).

- Membership:

- Member of INFORMS (INstitute For Operations Research and Management Science); since 1990.

- Member of MPS (Mathematical Programming Society); since 1994.
 - Member of SIAM (Society for Industrial and Applied Mathematics); since 1993.
- Editorship:
 - Editorial board member of Operations Research (2006 –).
 - Editorial board member of SIAM Journal on Optimization (2003 –).
 - Guest editor for Mathematical Programming, Series B, Special Volume Dedicated to Jos F. Sturm.
 - Editorial board member of Mathematical Methods of Operations Research (2007 – 2008).
 - Editorial board member of TOP (the OR journal of the Spanish Society of Statistics and Operations Research) (2006 –).
 - Editorial board member of Pacific Journal of Optimization (2003 –).
 - Editorial board member of Optimization and Engineering (2001 –).
- Reviewer:
 - Reviewer for Mathematical Reviews (1997 –).
 - Reviewer for US NSF grant proposals, Hong Kong RGC grant proposals, Netherlands NWO Scientific Grants, and Israel Science Foundation (ISF) grant proposals.
- International Conference Organization:
 - Co-Organizer (with Z.-Q. Luo), A Special Workshop in Honor of Prof. Paul Tseng: Large Scale Optimization: Analysis, Algorithm and Applications, May 21, 2010, Shanghai, China.
 - Co-Chair, Program Committee, WINE 2008 (Workshop on Internet and Network Economics), December 17 – 19, 2008, Shanghai, China.
 - Co-Organizer (with Z.-Q. Luo), WOSP 2007 (Workshop on Optimization and Signal Processing), December 19 – 21, 2007, Hong Kong.
 - Co-Cluster Chair, INFORMS 2006 (INstitute For Operations Research and Management Science) International, June 25 – 28, 2006, Hong Kong.
 - Organizing Committee member, WINE 2005 (Workshop on Internet and Network Economics), December 15 – 17, 2005, Hong Kong.

- Program Committee member and co-cluster chair, IFORS 2005 (International Federation of Operations Research Societies Conference), Hawaii, USA, 2005.
- Program Committee member, ICMSA 2005 (International Conference on Management Science and Applications), June 20 – 22, 2005, Chengdu, China.
- Secretary of the Program Committee, ICMP 2002 (International Conference on Mathematical Programming), December 19 – 22, 2002, Shanghai, China.
- Program Committee member, ICOTA 2001 (The 5th International Conference on Optimization: Techniques and Applications), December 15 – 17, 2001, Hong Kong.
- Organizing Committee member, International Workshop on Operations Research: Stochastic Models and Optimization, Part II, May 28 – 29, 2001, Hong Kong.
- Organizing Committee member, OHTA 2000 (International Workshop on Optimization Techniques and High-Tech Applications), October 23 – 25, 2000, Hong Kong.
- Organizer (co-organizers: J. Brinkhuis and J.B.G. Frenk), HPOPT 1999 (High Performance Optimization Techniques), June 16 – 18, 1999, World Trade Center, Rotterdam, The Netherlands.
- Organizer (co-organizers: J.B.G. Frenk, K. Roos and T. Terlaky), HPOPT 1997 (High Performance Optimization Techniques), August 20 – 22, 1997, World Trade Center, Rotterdam, The Netherlands.

• *Invited Academic Visits since 2000 (longer than one month):*

- Visiting professor at Department of Electrical and Computer Engineering, University of Minnesota, August 21 – December 20, 2006.
- Visiting professor at Department of Management Science and Engineering, Stanford University, August 2004.
- Visiting professor at Econometric Institute, Erasmus University Rotterdam, The Netherlands, June – July 2002; supported by trustfonds, Erasmus University Rotterdam.
- Visiting professor at Department of Electrical and Computer Engineering, McMaster University, Canada, July – August 2001.
- Visiting professor at Econometric Institute, Erasmus University Rotterdam, The Netherlands, June – July 2001; supported by trustfonds, Erasmus University Rotterdam.
- Visiting professor at Econometric Institute, Erasmus University Rotterdam, The Netherlands, June – July 2000; supported by Econometric Institute, Erasmus University Rotterdam.

• Recent Invited Talks at International Conferences and Workshops (2001 –):

1. Semi-plenary talk at the 20th International Symposium on Mathematical Programming, August 23 – 28, 2009, Chicago, USA.
Title: Approximation Algorithms for Polynomial Optimization.
2. Invited talk at The 8th Congress of Operations Research Society of China, October 18 – 20, 2008, Nanjing, China.
Title: Approximation Algorithms for Quartic Optimization Problems.
3. Plenary talk at The 4th Sino-Japan Optimization Meeting (SJOM), August 27 – 30, 2008, Tainan, Taiwan.
Title: Approximation Algorithms for Quadratic Optimization based on SDP Relaxation.
4. Semi-plenary talk at Foundations of Computational Mathematics (FoCM), June 24 – 26, 2008, Hong Kong.
Title: Beyond Quadratics: Quartic Optimization.
5. SIAM Optimization Conference, May 10 – 13, 2008, Boston, USA.
Title: Matrix Convex Functions and Optimization.
Title: Matrix Rank One Decomposition and Applications.
6. The International Conference on Nonlinear Programming and Applications, April 7 – 10, 2008, Beijing, China.
Title: Matrix Rank-One Decomposition and Applications.
7. The Tsinghua and Chinese University of Hong Kong Theory Workshop, November 30 – December 1, 2007, Beijing, China.
Title: Randomized Algorithms for Quadratic Optimization, via Semidefinite Programming.
8. The 6th International Conference on Numerical Linear Algebra and Optimization, September 7 – 12, 2007, Urumqi, China.
Title: Spectrum Management and Optimization
9. ICCOPT 2, August 13 – 16, 2007, McMaster University, Canada.
Title: Matrix Decomposition, Non-Convex QP and the Strong Lagrangian Duality.
10. EURO XXII, July 8 – 11, 2007, Prague, Czech Republic.
Title: Nonconvex Quadratic Optimization, Randomization, and Approximation Ratios.
11. The 32nd Conference on the Mathematics of Operations Research, January 16 – 18, 2007, Lunteren, The Netherlands.
Title of Lecture 1: SDP, Randomization, and Combinatorial Optimization.
Title of Lecture 2: Ambiguity, Uncertainty, and Robust Optimization.

12. The BIRS Workshop on Optimization and Engineering Applications, November 11 – 16, 2006, Banff, Canada.
Title: Optimization in Resource Management: Complexity, Lyapunov Theorem, and Approximation.
13. The Ninth Annual Kavli Chinese-American Frontiers of Science Symposium, October 26 – 28, 2006, Irvine, California.
Title: “To Be or Not To Be”: A Tale of Optimization and Randomization
14. Workshop on Optimization: Theory and Applications, July 9 – 11, 2006, Beijing, China.
Title: Complex QP, SDP, and Randomization: Approximation Ratios and Applications.
15. EURO XXI, July 2 – 5, 2006, Reykjavik, Iceland.
Title: Approximation Algorithms for Quadratic Optimization.
16. INFORMS International, June 25 – 28, 2006, Hong Kong.
Title: Extended Trust-Region Subproblem and Semidefinite Programming Relaxation.
17. International Workshop on Mathematical Finance and Insurance, May 27 – June 3, 2006, Lijiang, China.
Title: Randomized Decision Making: with Applications in Portfolio Selection.
18. Conference of the Mathematical Programming Society of China, April 23 – 25, 2006, Nanning, China.
Title: Complex Quadratic Optimization: Some Recent Developments.
19. International Conference on High Performance Scientific Computing, March 6 – 10, 2006, Hanoi, Vietnam.
Title: Approximation Algorithms for Quadratic Optimization.
20. Workshop on Semidefinite Programming, January 9 – 13, 2006, Singapore.
Title: Separated Continuous Conic Programming: Theory and Method.
21. The 3rd Sino-Japan Optimization Meeting, October 31 – November 2, 2005, Singapore.
Title: Complex Quadratic Optimization and Approximation Algorithms.
22. International Conference on Applied Mathematics, August 22 – 26, 2005, Bandung, Indonesia.
Title: Robust Investment Models.
23. Co-Cluster Chair, IFORS 2005, July 11 – 15, 2005, Hawaii, USA.
Title: Matrix Convex Functions.
24. International Conference of Management Science and Applications, June 20 – 22, 2005, Chengdu, China.
Title: Conic Optimization, Semidefinite Programming, and Applications.

25. International Conference on Scientific Computing 05, June 4 – 8, 2005, Nanjing Normal University, China.
Title: Complex Semidefinite Programming and Its Applications.
26. International Workshop on Optimization (IWOS2005), May 28 – 30, 2005, Tongji University Shanghai, China.
Title: Complex Semidefinite Programming and Its Applications.
27. Mini-symposium Organizer, SIAM Optimization Conference, May 15 – 19, 2005, Stockholm, Sweden.
Title: On Matrix Convex Functions.
28. Semi-plenary talk, 1st ICCOPT (International Conference on Continuous Optimization), August 2 – 4, 2004, Rensselaer Polytechnic Institute, USA.
Title: Complex Variables, Hermitian PSD Matrices, and Optimization.
29. Panel member, Forum on Management Science supported by the NSF of China, July 26, 2004, Chengdu, China.
30. The Third International Conference on Optimization and Control with Applications (OCA2004), July 25 – 31, 2004, Chongqing and Chengdu, China.
Title: On Conically Ordered Convex Programs.
31. The 8th International Workshop on High Performance Optimization Techniques: Optimization and Polynomials (HPOPT2004), dedicated to the memory of Jos Sturm, June 23 – 25, 2004, Amsterdam, The Netherlands.
Title: Ten Years Collaboration with Jos Sturm – A Tribute with Personal Memories.
32. Workshop on Mathematical Finance and Insurance, May 24 – 31, 2004, Tunxi, China.
Title: Asset Selection via SDP.
33. International Workshop on Large Scale Nonlinear Programming and Semidefinite Programming (in memory of Jos F. Sturm), May 12 – 15, 2004, University of Waterloo, Canada.
Title: Happy years in Groningen and Rotterdam.
34. International Symposium on Mathematical Programming, August 18 – 22, 2003, Copenhagen, Denmark.
Title: On the D-induced duality and its applications.
35. INFORMS Meeting, November 17 – 20, 2002, San Jose, USA.
Title: Nonnegative mappings and the D-duality.
36. Optimization and Control with Applications (OCA2002), August 18 – 22, 2002, Tunxi, China.
Title: A new self-dual embedding method for convex programming.

37. High Performance Optimization Techniques (HPOPT2002), June 27 – 28, 2002.
Title: On cones of nonnegative mappings.
38. International Conference on Recent Advances in Computational Mathematics (ICRACM2001), October 10 – 13, 2001, Matsuyama, Japan.
Title: SDP and quadratic optimization.
39. Workshop Smooth and Nonsmooth Optimization, July 2001, Erasmus University Rotterdam, The Netherlands.
Title: Stochastic optimization and interior point methods.
40. Seminar at TU Delft, July 2001, Delft, The Netherlands.
Title: Quadratic optimization and SDP relaxation.
41. Workshop on Stochastic Models & Operations Research, May 23 – 29, 2001, Beijing and Hong Kong.
Title: On stochastic programming.
42. International Conference on Numerical Optimization and Algebra, May 2001, Dun Huang.
Title: Cones of quadratic functions.
43. International Workshop on Mathematical Finance, May 2001, Shanghai.
Title: Stochastic programming and financial decision making.