

Curriculum Vitae
Shiqian Ma

ADDRESS

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EDUCATION

- **Ph.D. 2011**
Department of Industrial Engineering and Operations Research,
Columbia University, New York, NY, USA
Advisor: Donald Goldfarb
- **M.S. 2006**
Institute of Computational Mathematics and Scientific/Engineering Computing,
Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China
Advisor: Ya-xiang Yuan
- **B.S. 2003**
School of Mathematical Sciences, Peking University, Beijing, China.

WORKING EXPERIENCES

- September 2011 —
NSF Postdoctoral Fellow. Institute for Mathematics and its Applications (IMA), University of Minnesota.
- August — December 2010
Part-time Technical Employee. Siemens Corporate Research, Princeton, NJ, USA.
- June — September, 2007
Part-time Technical Employee. Siemens Corporate Research, Princeton, NJ, USA.
- June — August, 2006
Part-time Technical Employee. Accelicon Technologies Inc. R & D Center, Beijing, China.

HONORS AND AWARDS

- *Finalist of the INFORMS George Nicholson Student Paper Competition, 2011 (winner yet to be announced)*
- *Finalist of the 2011-2012 IBM Herman Goldstine Fellowship.*
- *INFORMS Optimization Society Best Student Paper Prize, 2010.*
- *The Class of 1988 Doctoral Fellowship (2009-2010).* This fellowship was awarded to two outstanding doctoral students with exceptional academic promise in the Department of IEOR, Columbia University.

RESEARCH INTERESTS

- Large-Scale Computational Optimization, Convex Optimization, Nonlinear Optimization
- Compressed Sensing, Medical Imaging, Image Processing
- Matrix Rank Minimization, Matrix Completion, Machine Learning
- Computational Complexity, Scientific Computing

PUBLICATIONS

(THE CITATION NUMBERS WERE OBTAINED FROM [HTTP://SCHOLAR.GOOGLE.COM](http://scholar.google.com) ON SEPT 6TH, 2011)

- Refereed Journal Papers

1. Zhiwei (Tony) Qin, Donald Goldfarb and **Shiqian Ma**. An Alternating Direction Method for Total Variation Denoising. *Under review in SIAM Journal on Imaging Sciences*. 2011.
2. Bo Huang, **Shiqian Ma** and Donald Goldfarb. Accelerated Linearized Bregman Method. *Under review in SIAM Journal on Imaging Sciences*. 2011.
3. Donald Goldfarb and **Shiqian Ma**. Fast Multiple Splitting Algorithms for Convex Optimization. *Conditionally accepted in SIAM Journal on Optimization pending minor revisions*. (INFORMS Optimization Society Best Student Paper Prize). 2010. (Citation: 10)
4. Donald Goldfarb, **Shiqian Ma** and Katya Scheinberg. Fast Alternating Linearization Methods for Minimizing the Sum of Two Convex Functions. *Under the 2nd round review in Mathematical Programming Series A*. 2010. (Citation: 17)
5. **Shiqian Ma**, Donald Goldfarb and Lifeng Chen. Fixed Point and Bregman Iterative Methods for Matrix Rank Minimization. *Mathematical Programming Series A*. 128 (1): 321-353, 2011. (Citation: 117)
6. Donald Goldfarb and **Shiqian Ma**. Convergence of Fixed-Point Continuation Algorithms for Matrix Rank Minimization. *Foundations of Computational Mathematics*. 11 (2): 183-210, 2011. (Citation: 17)
7. **Shiqian Ma** and Donald Goldfarb. Fast Alternating Linearization Methods for Robust Principal Component Analysis. To be submitted to *SIAM Journal on Imaging Sciences*, 2010
8. Yanfei Wang and **Shiqian Ma**, A Fast Subspace Method for Image Deblurring. *Applied Mathematics and Computation*. 215 (6): 2359-2377, 2009.
9. Yanfei Wang, **Shiqian Ma**, Hua Yang, Jindi Wang and Xiaowen Li. On The Effective Inversion by Imposing a priori Information for Retrieval of Land Surface Parameters. *Science in China Series D*. 52 (4):540-549, 2009. (Citation: 4)
10. Yanfei Wang and **Shiqian Ma**, Projected Barzilai-Borwein Methods for Large Scale Nonnegative Image Restorations. *Inverse Problems in Science and Engineering*. 15 (6) : 559-583, 2007. (Citation: 21)

- Refereed Conference Papers

1. Katya Scheinberg, **Shiqian Ma** and Donald Goldfarb. Sparse Inverse Covariance Selection via Alternating Linearization Methods. *Twenty-Fourth Annual Conference on Neural Information Processing Systems (NIPS)*. 2010. (Acceptance rate: 293/1219=24%) (Citation: 5)
2. Wei Liu, **Shiqian Ma**, Dacheng Tao, Jianzhuang Liu and Peng Liu. Semi-Supervised Sparse Metric Learning using Alternating Linearization Optimization. *The Sixteenth ACM SIGKDD International Conference On Knowledge Discovery and Data Mining (SIGKDD)*. 2010. (Acceptance rate: 101/578=17%)
3. **Shiqian Ma**, Wotao Yin, Yin Zhang and Amit Chakraborty. An Efficient Algorithm for Compressed MR Imaging Using Total Variation and Wavelets, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. 2008. (Acceptance rate: 508/1593=32%) (Citation: 35)

- Book Chapters, Non-Refereed Conference Papers and Technical Reports

1. Katya Scheinberg and **Shiqian Ma**. Optimization Methods for Sparse Inverse Covariance Selection. in *Suvrit Sra, Sebastian Nowozin, and Stephen J. Wright. editors: Optimization for Machine Learning, MIT Press, 2010*
2. Donald Goldfarb, **Shiqian Ma** and Zaiwen Wen. Solving Low-Rank Matrix Completion Problems Efficiently. *Invited paper at the 47th Allerton Conference on Communication, Control and Computing, Illinois, 2009* (Citation: 4)
3. Zaiwen Wen, Donald Goldfarb, **Shiqian Ma** and Katya Scheinberg. Row by Row Methods for Semidefinite Programming. *Technical Report, Columbia University*. 2009. (Citation: 10)

4. Yanfei Wang, **Shiqian Ma** and Qinghua Ma. Full Space and Subspace Methods for Large Scale Image Restoration. *in Y. F. Wang, A. G. Yagola and C. C. Yang editors: Optimization and Regularization for Computational Inverse Problems and Applications, Beijing/Berlin: Higher Education Press and Springer, 2010*
 5. Yanfei Wang, Xiaowen Li, **Shiqian Ma**, Hua Yang, Zuhair Nashed and Yanning Guan. BRDF Model Inversion of Multiangular Remote Sensing: Ill-posedness and the Interior Point Solution Method. *Proceedings of the 9th International Symposium on Physical Measurements and Signatures in Remote Sensing (ISPMSRS)*, Vol. XXXVI : 328-330, 2005.
- Other Publications
 1. **Shiqian Ma**. Fast Multiple Splitting Algorithms for Convex Optimization. *INFORMS OS Today. The Newsletter of the INFORMS Optimization Society*. 2011.

SOFTWARE PUBLICATIONS

1. Shiqian Ma. FPCA (Fixed Point Continuation with Approximate SVD): A Matlab code for matrix rank minimization and matrix completion problems. 2009
<http://www.columbia.edu/~sm2756/FPCA.htm>
2. Shiqian Ma and Wotao Yin. TVCMRI (Total Variation based Compressed MRI): A Matlab code for compressed MR imaging using total variation and wavelets. 2008
<http://www.columbia.edu/~sm2756/TVCMRI.htm>

PATENTS

- Amit Chakraborty, Wotao Yin and Shiqian Ma. US 20090141995: System and Method for Fixed Point Continuation for Total Variation Based Compressed Sensing Imaging, 06-04-2009.

TEACHING EXPERIENCES

- Guest lecture in the class “Optimization Methods in Machine Learning” by Dr. Katya Scheinberg, Fall 2009. I gave one lecture on the topic “Matrix Rank Minimization and Matrix Completion Problems”.
- Teaching Assistant for the following classes at Columbia University
 - Introduction to Mathematical Programming, Fall 2006 (94 students)
 - Applied Integer Programming, Spring 2007 (25 students), Spring 2009 (47 students)
 - Introduction to OR: Deterministic Models (Core course of Master of OR), Fall 2007 (99 students), Spring 2008 (30 students), Fall 2008 (143 students)
 - Optimization I (PhD core course), Fall 2009 (37 students)

PROFESSIONAL ACTIVITIES AND PRESENTATIONS

1. Attendee of the *Sparse Statistics, Optimization and Machine Learning Workshop*, Banff, Calgary, Canada. January 16-21, 2011.
2. Fast Splitting and Alternating Linearization Methods for Convex Optimization. *Invited talk at INFORMS Computing Society Conference, Monterey, CA, January 9-11, 2011*
3. Core participant of the *Modern Trends in Optimization and Its Application* workshop. IPAM, UCLA. September 12 – December 17, 2010.
4. Sparse Inverse Covariance Selection via Alternating Linearization Methods. *Poster presentation in NIPS 2010*. Vancouver, B.C., Canada. Dec. 6-9, 2010.
5. Fast Alternating Linearization Method for Sparse Inverse Covariance Selection. *Invited talk at INFORMS Annual Meeting, Austin, TX, November, 2010*
6. Fast Multiple Splitting Algorithms for Convex Optimization. *Invited talk at INFORMS Annual Meeting, Austin, TX, November, 2010*

7. Fast Splitting and Alternating Linearization Methods for Convex Optimization. *Invited talk at INFORMS Annual Meeting, Austin, TX, November, 2010*
8. First Order Methods for Matrix Rank Minimization. *Invited talk at the 10th MOPTA conference, Lehigh University, August, 2010*
9. Attendee of the ONR Compressed Sensing Workshop. Georgia Institute of Technology, Atlanta, GA. May 10-11, 2010.
10. Fixed Point and Bregman Iterative Methods for Matrix Rank Minimization. *Invited talk at the 20th International Symposium of Mathematical Programming (ISMP), Chicago, August, 2009*
11. Solving Low-Rank Matrix Completion Problems Efficiently. *Invited talk at the 47th Allerton Conference on Communication, Control and Computing. Allerton Park and Retreat Center, Illinois, October, 2009*
12. Fixed Point and Bregman Iterative Methods for Matrix Rank Minimization. *Invited talk at INFORMS Annual Meeting, San Diego, CA, October, 2009*
13. Alternating Direction Methods for Convex Semidefinite Programming and Nuclear Norm Minimization Problems. *Invited talk at INFORMS Annual Meeting, San Diego, CA, October, 2009*
14. An Efficient Algorithm for Compressed MR Imaging Using Total Variation and Wavelets. *Poster presentation in AFRL-Duke Compressive-Sensing Workshop. Duke University, Feb. 25-26, 2009.*
15. An Efficient Algorithm for Compressed MR Imaging Using Total Variation and Wavelets. *Poster presentation in CVPR 2008. Anchorage, Alaska. June 24-26, 2008.*
16. Attendee of the *SIAM Conference on Optimization*. Boston, MA. May 10-13, 2008.

PROFESSIONAL SERVICES

- Session Chair. INFORMS Annual Meeting, 2011.
- Referee for *Mathematical Programming (3)*, *SIAM Journal on Optimization (2)*, *IEEE Transactions on Medical Imaging (2)*, *Journal of Machine Learning Research*, *IEEE Transactions on Image Processing*, *Computational Optimization and Applications*, *Journal of Scientific Computing*, *Numerical Algorithms*, *IEEE Signal Processing Letters (4)*, *Optimization Methods and Software (2)*, *Computational Statistics and Data Analysis*, *Inverse Problems in Science and Engineering*, *Information Sciences*, *Frontiers of Mathematics in China*, *Acta Mathematica Scientia*
(Note: no number given if refereed only once.)