Xi He

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Education

Aug 2014 - Present	**Ph.D. Candidate in Industrial and System Engineering** Lehigh University, Bethlehem, PA, USA. Current advisor: Martin Takáč.
Aug 2012 - May 2014	**Master of Science in Computational Mathematics** Nankai University, Tianjin, P.R.China. Courses in: Numerical linear algebra, Optimization, PDE.
Sep 2008 - Jun 2012	**Bachelor of Science in Mathematics** Nankai University, Tianjin, P.R.China.

Research Interests

My research focuses on large-scale optimization algorithms and its applications in machine learning, more specifically, large-scale nonlinear optimization, stochastic gradient methods, statistical learning and high performance computing.

Working Papers

[1] Dual Free SDCA for Empirical Risk Minimization with Adaptive Probabilities, with Martin Takáč.
[2] Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligors, with Amit Chakraborty, Ioannis Akrotirianakis.
[3] Modeling Probability of Rare Catastrophic Failure in Complex Systems Using a Copula-based Approach, with Amit Chakraborty, Ioannis Akrotirianakis.
[4] Exploiting negative curvature in deep learning optimization problems, with Ioannis Akrotirianakis, Amit Chakraborty.
[5] Asynchronous Distributed Stochastic dual (Block) Coordinate Descent Methods, with Martin Takáč.
[6] Coordinate Descent Methods for Linearly Constrained Optimization, with Martin Takáč.
[7] A Method with Parameter for Solving the Spectral Radius of Nonnegative Tensor, with Yiyong Li, Qingzhi Yang. Submitted.

Research Experience

June 15' - Sep 15' Supervisor	**Large-loss Probability in Credit Portfolio Risk** *Amit Chakraborty, Head, Predictive Analytics Business Analytics and Monitoring, Siemens Corporation, Corporate Technology.* - Derive optimal risk loading coefficients. - Estimating large-loss probability of a portfolio.
Aug 14' - Jun 15' Supervisor	**Distributed Algorithm for Large-scale Optimization Problems** *Martin Takáč, Professor, Department of Industrial and Systems Engineering, Lehigh University.* - Develop distributed algorithm for solving large-scale optimization in machine learning. - Theoretic results on convergence and computational complexity.
Jul 13' - Jun 14' Supervisor	**Nonnegative Square (Rectangular) Tensor** *Qingzhi Yang, Professor, Department of Mathematics, Nankai University.* - Classify nonnegative tensors under different properties. - Develop fast algorithm to find spectral radius of nonnegative square tensor and implement it by Matlab and Mathematica. - Apply tensor theory to hypergraph and polynomial optimization problems.

Working and Volunteer Experience

Jun 15' - Sep 15'	**Research Assistant,** *Predictive Analytics Business Analytics and Monitoring,* Siemens Corporation, Corporate Technology, Princeton, NJ. - Portfolio Credit Risk and Deep Learning.
Sep 14' - Jun 15'	**Teaching Assistant,** *Department of Industrial and Systems Engineering,* Lehigh University, Bethlehem, PA. - Applied Engineering Statistics (Fall 2014 & Spring 2015).
Sep 13' - Jan 14'	**Teaching Assistant,** *Department of Mathematics,* Nankai University, P.R.China. - Theory of Optimization (Spring 2014) & Linear algebra (Fall 2013).

Talks

Aug 13'	**Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligors,** Siemens Corporation, Corporate Technology.
Nov 14'	**Random Coordinate Descent Method on Large-scale Optimization Problems,** Coral Semina, Lehigh University.

PhD courses and other training

Spring 15'	**Nonlinear Optimization,** Lehigh University.
Spring 15'	**Pattern Recognition,** Lehigh University.
Spring 15'	**Stochastic Modeling and Applications,** Lehigh University.
Fall 14'	**Linear Optimization,** Lehigh University.
Fall 14'	**Convex Analysis,** Lehigh University.
Fall 14'	**Integer Programming,** Lehigh University.
Spring 14'	**Machine Learning,** Andrew Ng (Stanford University), Coursera.
In progress	**High Performance Scientific Computing,** Randall J. LeVeque, Coursera.
	Machine Learning, Andrew Ng. (Standford University), Coursera.

Honors and Grants

Sep 14'	Dean's Doctoral Assistantship, Lehigh University.
Sep 13'	First Prize of Excellent Master Scholarship, Nankai University.
Sep 12'	Fellowship award, Nankai University.
Jun 12'	Excellent B.Sci Thesis, Nankai University.
Nov 11'	National Encouragement Scholarship, Nankai University.
Sep 08'	Second Prize Winner of National Olympics Contest of Math.

Conferences & Workshop Attended

Nov 15'	INFORMS Annual Meeting, Philadelphia
Aug 14'	MOPTA - Modeling and Optimization: Theory and Applications, Lehigh University.
Jun 14'	International Workshop of Spectral Graph and Hypergraph Theory, Fuzhou University.
Nov 13'	The 2nd Sino-German Workshop on Optimization, Chinese Academy of Sciences.
Jun 12'	International Conference on the Spectral Theory of the Tensor, Nankai University.
Jun 12'	Senior Workshop on the Spectral Theory of the tensor, Tianjin University.

Computing Skills

Programming	C++, Matlab, R, Python, Mathematica, Shell Script
Optimization	AMPL, CPLEX, MOSEK, Gurobi
Parallel Computing	MPI, OpenMP, Spark
Others	LaTeX, Mac OS, Linus, Windows

Reference

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