Xi He

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Education

Aug 14' - Present	**Ph.D. Candidate in Lehigh University, Bethlehem, PA, USA**
	Major...............: Industrial and System Engineering
	Current advisor: Prof. Martin Takáč
Aug 12' - May 14'	**Master of Science in Nankai University, Tianjin, China**
	Major...............: Computational Mathematics
	Advisor............: Prof. Qingzhi Yang
Sep 08' - Jun 12'	**Bachelor of Science in Nankai University, Tianjin, China**
	Major...............: Mathematics

Working Experience

Internship
June 15' - Sep 15'

Predictive Analytics and Monitoring, Siemens Corporation, Princeton, NJ, USA

Deep Learning via Hessian-Free Approach

- Propose new algorithm which make use of its approximated local Hessian Matrix information.
- Guarantees to reach local optimality instead of sticking at critical point.
- Share better and more stable performance.

Estimating Large-Loss Probability in Credit Portfolio Risk

- Derive optimal risk loading coefficients by fully using dependency information among obligors.
- Estimate large-loss probability of a portfolio by normal copula model and important sampling.

Research Assistant
Sep 14' - May 15'

Department of Industrial and Systems Engineering, Lehigh University

Dual Free SDCA method with adaptive probabilities

- Derive optimal probability distribution for dual free SDCA by exploring sub-optimality.
- Better performance is shown by taking consideration of sub-optimality of each coordinate.

Asynchronous CoCoA

- Propose asynchronous distributed algorithms for empirical minimization problem.

Teaching Assistant
Sep 14' - May 15'

Department of Industrial and Systems Engineering, Lehigh University

Applied Engineering Statistics

Working Papers

Conference

[1] **Dual Free SDCA for Empirical Risk Minimization with Adaptive Probabilities**, with Martin Takáč. Accepted by NIPS 2015.

[2] **Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligors,** with Amit Chakraborty, Ioannis Akrotirianakis.

[3] **Exploiting negative curvature in deep learning optimization problems,** with Ioannis Akrotirianakis, Amit Chakraborty.

[4] **Asynchronous Distributed Stochastic dual (Block) Coordinate Descent Methods,** with Martin Takáč.

[5] **Coordinate Descent Methods for Linearly Constrained Optimization,** with Martin Takáč.

Journal

[6] **A Method with Parameter for Solving the Spectral Radius of Non-negative Tensor,** with Yiyong Li, Qingzhi Yang. Submitted.

Computing Skills

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

Selected courses and Projects

Fall 15’ — **Massive Data Mining,** Lehigh University.

Fall 15’ — **Computational Method,** Lehigh University.

► ***Compressed Sensing:*** Using ℓ_1-regularized lasso model to recovery pictures with missing pixels. Multiple algorithms (ISTA, FISTA, GRPS) are implemented ” in C++ and compared.

Spring 15’ — **Pattern Recognition,** Lehigh University.

► ***Digit Recognizer:*** Implemented a Matlab software package to compare various of classifier technologies (Support Vector Machine, Artificial Neural Network, Decision Tree, KKN) for character-image classification problem.

Fall 14’ — **Integer Programming,** Lehigh University.

► ***Mixed binary problem solver:*** Implemented a Python software package to address mixed binary programming problem with branch and cut method..

Spring 14’ — **Machine Learning,** Andrew Ng, Coursera.

In progress — **High Performance Scientific Computing,** Randall J. LeVeque, Coursera.

Talks

On going — **Dual Free SDCA for Empirical Risk Minimization with Adaptive Probabilities,** NIPS 2015, Montréal, Canada.

Aug 13’ — **Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligors,** Siemens Corporation, Corporate Technology, Princeton, US.

Nov 14’ — **Random Coordinate Descent Method on Large-scale Optimization Problems,** Coral Semina, Lehigh University.

Honors and Grants

Sep 15’ - Jan 16’	Dean’s Doctoral Fellowship, Lehigh University.
Sep 14’ - Sep 15’	Dean’s Doctoral Assistantship, Lehigh University.
Sep 13’ - Jun 14’	First Prize of Excellent Master Scholarship, Nankai University.
Sep 12’ - Jun 14’	Fellowship Award, Nankai University.

Reference

Martin Takáč, Department of Industrial and Systems Engineering, H.S. Mohler Laboratory, Lehigh University, Bethlehem, PA 18015, takac@lehigh.edu.