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
Sep 08' - Jun 12'	**Bachelor of Science in Nankai University, Tianjin, China** Major.....: Mathematics

Working Experience

Participant Aug 15' - Present	*Intel Corporation, Santa Clara, CA, USA* **Large-scale Distributed Optimization in Deep Neural Networks** ▶ Implemented various of standard approached to training deep learning model. ▶ Applied distributed high performance computing technique to accelerate training rate.
Research Assistant Nov 15 - Feb 16'	*Department of Industrial and Systems Engineering, Lehigh University* **Dual Free Mini-batch SDCA with adaptive probabilities** ▶ Derived optimal probability distribution for dual free SDCA by exploring sub-optimality. ▶ Developed unbiased non-uniform mini-batch sampling techniques to improve performance. ▶ Guaranteed better complexity bound and convergence rate for the adaptive algorithm.
Internship June 15' - Sep 15'	*Predictive Anytics and Monitoring, Siemens Corporation, Princeton, NJ, USA* **Deep Learning via Hessian-Free Approach** ▶ Proposed new algorithm which made use of its approximated local Hessian Matrix information. ▶ Guaranteed to reach local optimality instead of sticking at critical point. **Estimating Large-Loss Probability in Credit Portfolio Risk** ▶ Derived optimal risk loading coefficients by fully using dependency information among obligors. ▶ Estimated 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* **Asynchronous CoCoA** ▶ Proposed asynchronous distributed algorithms for empirical minimization problem. ▶ Analyzed communication efficient protocol to achieve better speed-up.
Teaching Assistant Sep 14' - May 15'	*Department of Industrial and Systems Engineering, Lehigh University* **Applied Engineering Statistics**

Publications

Conference	**[1] Dual Free Adaptive Mini-Batch SDCA for Empirical Risk Minimization**, with Martin Takáč. Under Reviewed by ICML 2016. **[2] Dual Free SDCA for Empirical Risk Minimization with Adaptive Probabilities**, with Martin Takáč. Accepted by NIPS 2015. **[3] Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligors,** 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.

Journal	**[6] Coordinate Descent Methods for Linearly Constrained Optimization,** with Martin Takáč. **[7] A Method with Parameter for Solving the Spectral Radius of Non-negative Tensor,** with Yiyong Li, Qingzhi Yang. Under Review.

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

Spring 16'	**Optimization in Machine Learning,** Lehigh University.
Fall 15'	**Massive Data Mining,** Lehigh University. ► ***Question & Answer System:*** Designed competitive Q&A system to attain up to 39.5% accuracy by detecting Apache Lucene and Natural Language Toolkit, etc..
Fall 15'	**Computational Method,** Lehigh University. ► ***Compressed Sensing:*** Used of 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 classifiers (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 (Stanford University), Coursera.
In progress	**High Performance Scientific Computing,** Randall J. LeVeque, Coursera. **Machine Learning,** Andrew Ng, Coursera.

Presentation

Nov 15'	**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 Seminar, Lehigh University.

Honors and Grants

Jan 16' - May 16'	Dean's Doctoral Fellowship, Lehigh University.
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

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