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

Participant Aug 15' - Present	*Intel Corporation, Santa Clara, CA, USA* **Large-scale distributed optimization in deep neural networks** ▶ Implement various of standard approached to training deep learning model. ▶ Apply distributed high performance computing technique to accelerate training rate.
Internship June 15' - Sep 15'	*Predictive Anytics 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 Nonnegative 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

Spring 16'	**Optimization in Machine Learning,** Lehigh University.
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 (Stanford University), Coursera.
In progress	**High Performance Scientific Computing,** Randall J. LeVeque, Coursera.
	Machine Learning, Andrew Ng, Coursera.

Talks

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 Semina, 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

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