

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	<i>Intel Corporation, Santa Clara, CA, USA</i> Large-scale Distributed Optimization in Deep Neural Networks <ul style="list-style-type: none">► 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'	<i>Department of Industrial and Systems Engineering, Lehigh University</i> Dual Free Mini-batch SDCA with adaptive probabilities <ul style="list-style-type: none">► 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'	<i>Predictive Anytics and Monitoring, Siemens Corporation, Princeton, NJ, USA</i> Deep Learning via Hessian-Free Approach <ul style="list-style-type: none">► 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 <ul style="list-style-type: none">► 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'	<i>Department of Industrial and Systems Engineering, Lehigh University</i> Asynchronous CoCoA <ul style="list-style-type: none">► Proposed asynchronous distributed algorithms for empirical minimization problem.► Analyzed communication efficient protocol to achieve better speed-up.
Teaching Assistant Sep 14' - May 15'	<i>Department of Industrial and Systems Engineering, Lehigh University</i> Applied Engineering Statistics

PUBLICATIONS

Conference	<ul style="list-style-type: none">[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.
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Journal

- [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 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, L ^A T _E X, Mac OS, Linus, Windows

SELECTED COURSES AND PROJECTS

Spring 16'	Optimization in Machine Learning , Lehigh University.
Fall 15'	Massive Data Mining , Lehigh University. <ul style="list-style-type: none"> ► <i>Question & Answer System</i>: 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. <ul style="list-style-type: none"> ► <i>Compressed Sensing</i>: 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. <ul style="list-style-type: none"> ► <i>Digit Recognizer</i>: 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. <ul style="list-style-type: none"> ► <i>Mixed binary problem solver</i>: 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

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