

# Xi He

837 Cedar Hill Drive, Allentown, PA, 18109  
(484)633-8040 xih314@lehigh.edu <http://xihey.com>

## EDUCATION

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

## WORKING EXPERIENCE

<b>Participant</b> Aug 15' - Present	<i>Intel Corporation, Santa Clara, CA, USA</i> <b>Large-scale distributed optimization in deep neural networks</b> <ul style="list-style-type: none"><li>► Implement various of standard approached to training deep learning model.</li><li>► Apply distributed high performance computing technique to accelerate training rate.</li></ul>
<b>Internship</b> June 15' - Sep 15'	<i>Predictive Anytics and Monitoring, Siemens Corporation, Princeton, NJ, USA</i> <b>Deep Learning via Hessian-Free Approach</b> <ul style="list-style-type: none"><li>► Propose new algorithm which make use of its approximated local Hessian Matrix information.</li><li>► Guarantees to reach local optimality instead of sticking at critical point.</li><li>► Share better and more stable performance.</li></ul> <b>Estimating Large-Loss Probability in Credit Portfolio Risk</b> <ul style="list-style-type: none"><li>► Derive optimal risk loading coefficients by fully using dependency information among obligors.</li><li>► Estimate large-loss probability of a portfolio by normal copula model and important sampling.</li></ul>
<b>Research Assistant</b> Sep 14' - May 15'	<i>Department of Industrial and Systems Engineering, Lehigh University</i> <b>Dual Free SDCA method with adaptive probabilities</b> <ul style="list-style-type: none"><li>► Derive optimal probability distribution for dual free SDCA by exploring sub-optimality.</li><li>► Better performance is shown by taking consideration of sub-optimality of each coordinate.</li></ul> <b>Asynchronous CoCoA</b> <ul style="list-style-type: none"><li>► Propose asynchronous distributed algorithms for empirical minimization problem.</li></ul>
<b>Teaching Assistant</b> Sep 14' - May 15'	<i>Department of Industrial and Systems Engineering, Lehigh University</i> <b>Applied Engineering Statistics</b>

## WORKING PAPERS

Conference	<p>[1] <b>Dual Free SDCA for Empirical Risk Minimization with Adaptive Probabilities</b>, with Martin Takáč. Accepted by NIPS 2015.</p> <p>[2] <b>Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligor</b>s, with Amit Chakraborty, Ioannis Akrotirianakis.</p> <p>[3] <b>Exploiting negative curvature in deep learning optimization problems</b>, with Ioannis Akrotirianakis, Amit Chakraborty.</p> <p>[4] <b>Asynchronous Distributed Stochastic dual (Block) Coordinate Descent Methods</b>, with Martin Takáč.</p>
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Journal	[5] <b>Coordinate Descent Methods for Linearly Constrained Optimization</b> , with Martin Takáč.
	[6] <b>A Method with Parameter for Solving the Spectral Radius of Non-negative Tensor</b> , with Yiyong Li, Qingzhi Yang. Submitted.

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## COMPUTING SKILLS

Programming	C++ (MPI, OPENMP), MATLAB, R, PYTHON (SPARK), MATHEMATICA
Optimization	AMPL, CPLEX, MOSEK, Gurobi
Others	SHELL SCRIPT, L <sup>A</sup> T <sub>E</sub> X, Mac OS, Linus, Windows

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## SELECTED COURSES AND PROJECTS

Spring 16'	<b>Optimization in Machine Learning</b> , Lehigh University.
Fall 15'	<b>Massive Data Mining</b> , Lehigh University.
Fall 15'	<b>Computational Method</b> , Lehigh University. ▶ <i>Compressed Sensing</i> : Using $\ell_1$ -regularized lasso model to recovery pictures with missing pixels. Multiple algorithms (ISTA, FISTA, GRPS) are implemented " in C++ and compared.
Spring 15'	<b>Pattern Recognition</b> , Lehigh University. ▶ <i>Digit Recognizer</i> : 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'	<b>Integer Programming</b> , Lehigh University. ▶ <i>Mixed binary problem solver</i> : Implemented a Python software package to address mixed binary programming problem with branch and cut method..
Spring 14'	<b>Machine Learning</b> , Andrew Ng (Stanford University), Coursera.
In progress	<b>High Performance Scientific Computing</b> , Randall J. LeVeque, Coursera. <b>Machine Learning</b> , Andrew Ng, Coursera.

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## TALKS

Nov 15'	<b>Dual Free SDCA for Empirical Risk Minimization with Adaptive Probabilities</b> , NIPS 2015, Montréal, Canada.
Aug 13'	<b>Estimating Portfolio Loss Probabilities with Optimal Risk Loading Coefficients and Fixed Dependency among Obligors</b> , Siemens Corporation, Corporate Technology, Princeton, US.
Nov 14'	<b>Random Coordinate Descent Method on Large-scale Optimization Problems</b> , Coral Semina, Lehigh University.

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## 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.

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## REFERENCE

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