Cong Han Lim

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Academic Appointments

Georgia Institute of Technology — **Atlanta, GA**
Postdoctoral Fellow (Data Science), Industrial and Systems Engineering — Summer 2018–Present
Host: Shabbir Ahmed

University of Wisconsin-Madison — **Madison, WI**
Postdoctoral Research Associate, Wisconsin Institute for Discovery — Fall 2016–Summer 2018
Hosts: Jeffrey Linderoth, James Luedtke, and Stephen Wright

Simons Institute for the Theory of Computing — **Berkeley, CA**
Research Fellow — Fall 2017
Semester on Bridging Continuous and Discrete Optimization

Research Interests

Main Area: Large-scale mathematical optimization problems in *machine learning* and *operations research*
Topics: Regularization for learning, distributed optimization, mixed-integer (nonlinear) programming, stochastic programming, permutation and ranking problems

Education

University of Wisconsin-Madison — **Madison, WI**
Ph.D., Computer Sciences — 2010–2016
Advisor: Stephen Wright
Dissertation: Relaxations for Some Discrete Optimization Problems

University of Wisconsin-Madison — **Madison, WI**
M.S., Computer Sciences — 2010–2012

Univeristy of Chicago — **Chicago, IL**
B.S. (honors), Mathematics; B.S. (honors), Computer Science — 2006–2010

Publications

8. C.H. Lim. An Efficient Pruning Approach for Robust Isotonic Regression, *Conference on Neural Information Processing Systems (NeurIPS)*, 2018.
7. C. Lee, C.H. Lim, S.J. Wright. A Distributed Quasi-Newton Algorithm for Empirical Risk Minimization with Nonsmooth Regularization, *Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2018.
6. C.H. Lim, S.J. Wright. *k*-Support and Ordered Weighted Sparsity for Overlapping Groups: Hardness and Algorithms, *Conference on Neural Information Processing Systems (NeurIPS)*, 2017.
5. C.H. Lim, J. Linderoth, J. Luedtke. Valid Inequalities for Separable Concave Constraints with Indicator Variables, *Mathematical Programming*, 2017.

4. C.H. Lim, S.J. Wright. A Box-Constrained Approach for Hard Permutation Problems, *International Conference on Machine Learning (ICML)*, 2016.
3. C.H. Lim, S.J. Wright. Efficient Bregman Projection onto the Permutahedron and Related Polytopes, *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2016.
2. C.H. Lim, J. Linderoth, J. Luedtke. Valid Inequalities for Separable Concave Constraints with Indicator Variables, *Integer Programming and Combinatorial Optimization (IPCO)*, 2016.
1. C.H. Lim, S.J. Wright. Beyond the Birkhoff Polytope: Convex Relaxations for Vector Permutation Problems, *Conference on Neural Information Processing Systems (NeurIPS)*, 2014.

Refereed Workshop Papers

1. C.H. Lim. A Note on Extended Formulations for Cardinality-based Sparsity, *NeurIPS Optimization for Machine Learning Workshop*, 2017.

Submitted and Working Papers

5. C.H. Lim, D. Pecin, S. Ahmed, M.-S. Cheon, M. Savelsbergh. Similarity Learning for Column Generation with Applications to Maritime Inventory Routing Problems, *Working Paper*.
4. I. Mahmutogullari, C.H. Lim, S. Ahmed. Approximations via Neural Networks for Stochastic Dual Dynamic Programming, *Working Paper*.
3. C.H. Lim. Faster Smoothed Isotonic Regression via Dynamic Programming, *Working Paper*.
2. C.H. Lim, J. Linderoth, J. Luedtke, S.J. Wright. Subgradient Sampling Methods for the Lagrangian Dual in Stochastic Mixed-Integer Programming, *In submission*.
1. J. Chen, C.H. Lim, P. Qian, J. Linderoth, S.J. Wright. Validating Sample Average Approximation Solutions with Negatively Dependent Batches, *In Submission*.

Invited Talks

Similarity Learning for Column Generation with Applications to Maritime Inventory Routing Problems,
INFORMS Computing Society Conference January 2019

Towards Large-Scale Nonconvex/Stochastic Discrete Optimization,
Cornell University, ORIE Seminar March 2018
Georgia Tech, ARC-TRIAD Seminar January 2018
University of Waterloo, Combinatorics & Optimization Seminar January 2018

Subgradient Methods for Stochastic Mixed-Integer Programs,
International Symposium on Mathematical Programming (ISMP) July 2018
INFORMS Annual Meeting October 2017

Optimization Problems Involving Permutations,
National University of Singapore, Mathematics Seminar October 2016

Valid Inequalities for Separable Concave Constraints,
International Symposium on Mathematical Programming (ISMP) July 2015

Honors and Awards

Simons Research Fellowship, Fall 2017, Simons Institute for the Theory of Computing

Computer Sciences Department Summer Fellowship 2011, University of Wisconsin-Madison

Teaching Experience

University of Wisconsin-Madison **Madison, WI**
Computer Sciences Department

Teaching Assistant – Database Management Systems	Fall 2012
Volunteer – Scratch programming language for elementary school students	Fall 2012
Teaching Assistant – Numerical Methods	Spring 2012
Teaching Assistant – Algorithms	Fall 2011
Teaching Assistant – Algorithms (Honors), Algorithms	Spring 2011
Teaching Assistant – Theory of Computation	Fall 2010

University of Chicago **Chicago, IL**
Mathematics Department and Computer Science Department

Grader – Linear Algebra, Introduction to Computer Systems	Academic Year 2009-2010
Course Assistant – Computer Science with Applications I	Fall 2009
Teaching Assistant – Calculus I-II	Summer 2009

Academic Service

Reviewer:
Journals – Machine Learning, Mathematical Programming, Optimization Methods and Software, SIAM Journal on Optimization.
Conferences – ALT, ICML, IPCO, SDM

Industry Experience

Technicolor SA **Los Altos, CA**
Research Intern, Technicolor Research Bay Area Summer 2015
- Developed coding theory techniques for robust DNA storage.

Facebook **Menlo Park, CA**
Software Engineering Intern, Ads Optimization Group Summer 2012
- Augmented machine learning framework for click-through-rate prediction to support a new class of features.

Other Work Experience

Ministry of Manpower (Singapore) **Singapore**
Intern, Income Security Policy Department Summer 2007
- Analyzed effects of personal pension fund withdrawal for tertiary education.

Military Service: 6SIR Support Company, Singapore Armed Forces **Singapore**
Personal Assistant to Officer-in-Commanding August 2004 - June 2006
- Awarded 'Outstanding' grade for overall performance during service.

Skills

Programming Languages: Python, C/C++, Julia, MATLAB, Java

Mathematical Modeling Frameworks: Gurobi, CPLEX, CVX, JuMP, Pyomo, GAMS, YALMIP

Languages: English (native), Chinese (fluent – speaking Mandarin, writing)

References

Stephen Wright
Professor
Department of Computer Sciences
University of Wisconsin-Madison
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Jeffrey Linderoth
Professor and Department Chair
Department of Industrial and Systems Engineering
University of Wisconsin-Madison
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