DEYI LIU

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EDUCATION

University of North Carolina at Chapel Hill (UNC) Aug. 2017 - Present
Ph.D. in Operations Research (3rd year), Expected May 2022 *Advisor: Quoc Tran-Dinh*

Zhejiang University (ZJU) Sept. 2013 - Jun. 2017
B.S. in Mathematics and Applied Mathematics *Major GPA: 3.92/4*

PUBLICATIONS

[1] An Inexact Interior-Point Lagrangian Decomposition Algorithm with Inexact Oracles

Deyi Liu, Quoc Tran-Dinh.
Submitted to Journal of Optimization Theory and Applications(JOTA). https://arxiv.org/abs/1904.09016

[2] A Frank-Wolfe-based Projected Newton Algorithm for Constrained Self-concordant Minimization

Deyi Liu, Volkan Cevher, Quoc Tran-Dinh.
(under review). https://arxiv.org/abs/2002.07003

[3] Randomized Non-stationary Primal-Dual Algorithms for Nonsmooth Convex Optimization with Faster Convergence Rates

Quoc Tran-Dinh, **Deyi Liu**.
(under review).

EXPERIENCE

Augmented Self-concordant Barrier and Non-convex Optimization Feb. 2020 - Present
Research Assistant (advised by Quoc Tran-Dinh) *Chapel Hill, NC*

- Apply the augmented barrier method to solve constrained self-concordant minimization.
- Reformulate the fractional programming to DC (Difference of Convex functions) programming and use DCA (DC Algorithms) or Stochastic DCA to find a local minimum.
- Generalize primal-dual interior-point method to solve non-smooth composite problem.

Faster Stochastic Primal-Dual Method (*publication [3]*) May. 2019 - Feb. 2020
Research Assistant (advised by Quoc Tran-Dinh) *Chapel Hill, NC*

- Github : https://github.com/unc-optimization/AccSPD
- Proved the convergence rate of our stochastic primal-dual method is faster.
- Outperformed state-of-the-art algorithms in SVM and Least Absolute Derivation (LAD) examples.

Frank-Wolfe-based Method for Non-Lipschitz Function (*publication [2]*) May. 2019 - Oct. 2019
Research Assistant (advised by Quoc Tran-Dinh) *Chapel Hill, NC*

- Github : https://github.com/unc-optimization/FWPN
- Combined Frank-Wolfe method with Projected Newton method to solve constrained self-concordant minimization.
- Outperformed state-of-the-art algorithms in logistic regression, D-optimal design and portfolio optimization.

Inexact Algorithm for Constrained Composite Optimization (*publication [1]*) Aug. 2018 - Apr. 2019
Research Assistant (advised by Quoc Tran-Dinh) *Chapel Hill, NC*

- Developed an interior-point dual decomposition method for a non-smooth composite optimization problem.
- Analyzed the algorithm under inexact setting and gave the inexact accuracy needed for each iteration to guarantee convergence. Proved polynomial-time iteration-complexity of the algorithm.

- Applied our method to solve real network problem with more than 10,000 nodes.

Crank-Nicolson Method for PDE Jul. 2016 - Aug. 2016
Research Assistant (advised by Zhilin Li) *Raleigh, NC*

- Designed a numerical method to solve unbounded parabolic PDE in Financial Mathematics.
- Presented in the 15th NCSU's Annual Summer Undergraduate Research Symposium.

PROFESSIONAL SERVICE

Conference/Journal Reviewer: AISTATS (2019), ICML (2019), NIPS (2019), IEEE Conference on Decision and Control (2019), Computational Optimization and Applications (2019)

AWARDS

Outstanding Achievement Award (Top 1 in Ph.D. qualifying exam), UNC, USA 2017-2018

The Second-Prize of the National Talents Training, ZJU, China 2014-2015

The Second-class Scholarship for Outstanding Merits, ZJU, China 2013-2014

TEACHING ACTIVITIES

Teaching Assistant of STOR 641: Stochastic Models in Operations Research I (*graduate level*) 2018 Fall

Teaching Assistant of STOR 155: Introduction to Data Models (*fresh undergraduate level*) 2018 Spring

Teaching Assistant of STOR 445: Stochastic Modeling (*senior undergraduate level*) 2017 Fall

TECHNICAL & LANGUAGE STRENGTHS

Programming: Matlab, Python, R, C, SQL
Framework/Tools: Linux, Latex, SLURM, Sublime