

Caleb Ju

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EDUCATION

Georgia Institute of Technology

Ph.D., Operations Research (Minor: Mathematics) 2021 –

Computational Science and Engineering (Transferred after 1 year) 2020 – 2021

Advisor: Professor Guanghui (George) Lan

University of Illinois Urbana-Champaign

2016 – 2020

B.S., Computer Science and Mathematics

Graduated with High Distinction

PUBLICATIONS

1. Ji Gao, Abigael Wahlen, **Caleb Ju**, Yongsheng Chen, Guanghui Lan, Zhaohui Tong. *Reinforcement Learning-Based Control for Waste Biorefining Processes Under Uncertainty*. Communications Engineering, Feb 2024.
2. **Caleb Ju**^{*}, Yifan Zhang^{*}, and Edgar Solomonik. *Communication lower bounds for nested bilinear algorithms*. Foundations of Computational Mathematics, Nov 2023.
3. **Caleb Ju**, Serif Yesil, Mengyuan Sun, Chandra Chekuri, Edgar Solomonik. *Efficient parallel implementation of the multiplicative weight update method for graph-based linear programs*. arXiv, Jul 2023.
4. **Caleb Ju** and Guanghui Lan. *Dual dynamic programming for stochastic programs over an infinite horizon*. arXiv, Mar 2023.
5. **Caleb Ju**, Georgios Kotsalis, Guanghui Lan. *A model-free first-order method for linear quadratic regulator with $\tilde{O}(1/\varepsilon)$ sampling complexity*. arXiv, Dec 2022.
6. Yan Li, **Caleb Ju**, Ethan X. Fang, Tuo Zhao. *Implicit regularization of Bregman proximal point algorithm and mirror descent on separable data*. Submitted, Aug 2021.
7. **Caleb Ju** and Edgar Solomonik. *Derivation and analysis of fast bilinear algorithms for convolution*. SIAM Review, Nov 2020.

Asterisk denotes equal contribution.

PRESENTATIONS

1. Caleb Ju, Serif Yesil, Mengyuan Sun, Chandra Chekuri, Edgar Solomonik *Efficient parallel implementation of the multiplicative weight update method for graph-based linear programs*. SIAM Applied Linear Algebra. 2024.
2. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *A First-Order Method for Solving Linear Quadratic Regulator*. INFORMS Annual Review. 2023.
3. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *A First-Order Method for Solving Linear Quadratic Regulator*. ICSP23. 2023.
4. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *A First-Order Method for Solving Linear Quadratic Regulator*. SIAM OP23. 2023.
5. Caleb Ju. *Dual dynamic programming for solving infinite-horizon stochastic multi-stage programs*. ISyE Student Seminar. 2023.

6. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *Improved Convergence Rates for Linear Quadratic Regulator*. INFORMS Annual Review. 2022.
7. Caleb Ju and Sourabh Dalvi. *Decomposition Methods for Long-Duration Energy Storage*. NREL GPAC Seminar. 2022.
8. Caleb Ju. *Decentralized Distributed Optimization for Sum of Convex Functions*. Summer Argonne Students Symposium (SASSy). 2021.
9. Caleb Ju and Navjot Singh. *Solving Positive LPs in Parallel using the Multiplicative Weights Update (MWU)*. UIUC Parallel Graph Algorithms Reading Group. 2020.
10. Caleb Ju. *Parallel approximate undirected shortest paths via low hop emulators*. UIUC Theory Seminar. 2020.
11. Caleb Ju and Edgar Solomonik. *Bilinear algorithms for convolution*. University of Illinois Summer Presentation Poster Symposium. 2019.

AWARDS AND ACHIEVEMENTS

SIAM LA24 Travel Award	2024
SIAM PP24 Travel Award	2024
Finalist for INFORMS 2023 Annual Meeting Poster Competition	2023
MOPTA 2023 Best Poster Award	2023
Department of Energy Computational Science Graduate Fellowship	2021 – 2025
SIAM OP21 Travel Award	2021

RESEARCH EXPERIENCE

Lawrence Berkeley National Laboratory, Machine Learning and Analytics	2024
Visiting summer researcher	
Advisor: Prof. Michael Mahoney	
Topic: Recycling randomized preconditioners for saddle point problems	
National Renewable Energy Laboratory, GPAC	2022
Visiting researcher (“Summer practicum”)	
Advisors: Dr. Bethany Frew and Sourabh Dalvi	
Topic: Decomposition methods for long duration energy storage	
Argonne National Laboratory, MCS Division	2021
Givens Associate	
Advisors: Dr. Jeffrey Larson and Dr. Stefan Wild	
Topic: Distributed numerical optimization routines for libEnsemble	
University of Illinois, Department of Computer Science	2020
Summer Research Assistant	
Advisors: Professors Chandra Chekuri and Edgar Solomonik	
Topic: Parallel algorithms for mixed positive LPs	
Laboratory for Parallel Numerical Algorithms	2018 – 2020
Undergraduate Research Assistant	
Advisor: Professor Edgar Solomonik	
Topic: Bilinear algorithms	

SERVICE

MOPTA session chair	2023
Test writer for Georgia Tech ISyE high school statistics competition	2022
Reviewer for Georgia Tech SURE program	2022

WORK EXPERIENCE

Fivetran	2018
Software Engineering Intern, Backend	
AbbVie	2017
Lab Intern, Formulations Group	

TEACHING EXPERIENCE

Course Assistant: Algorithms	2020
Course Assistant: Intro to Algorithms and Models of Computation	2019

SKILLS

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

Libraries/Software: CUDA, NumPy, JuMP, petsc4py, OpenMP, Gurobi, CPLEX, AWS, PyTorch

Last updated: August 2024