Caleb Ju

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EDUCATION

Georgia Institute of Technology

Ph.D., Operations Research (Minor: Mathematics)   2021 –
Advisor: Professor Guanghui (George) Lan
Computational Science and Engineering (PhD admit in 2020. Transferred after 1 year)

University of Illinois Urbana-Champaign   2016 – 2020
B.S., Computer Science and Mathematics
Graduated with High Distinction

PUBLICATIONS AND CONFERENCES (W/ PROCEEDINGS)

$^\alpha$ denotes alphabetical ordering. Asterisk denotes equal contribution.

1. **Caleb Ju**, Georgios Kotsalis, Guanghui Lan. *A model-free first-order method for linear quadratic regulator with $\tilde{O}(1/\varepsilon)$ sampling complexity*. Accepted in SIAM Journal of Control and Optimization, Feb 2025.

2. **Caleb Ju** and Constance Crozier. *Learning a Local Trading Strategy: Deep Reinforcement Learning for Grid-scale Renewable Energy Integration*. Hawaii International Conference on System Sciences (HICSS-58), Aug 2024.

3. 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.

4. **Caleb Ju***, Yifan Zhang*, and Edgar Solomonik. *Communication lower bounds for nested bilinear algorithms*. Foundations of Computational Mathematics, Nov 2023.

5. **Caleb Ju** and Edgar Solomonik. *Derivation and analysis of fast bilinear algorithms for convolution*. SIAM Review, Nov 2020.

SUBMITTED PAPERS AND PRE-PRINTS

1. **Caleb Ju**$^\alpha$ and Guanghui Lan. *Strongly-Polynomial Time and Validation Analysis of Policy Gradient Methods*. Submitted to Mathematical Programming, Nov 2024.

2. **Caleb Ju**$^\alpha$ and Guanghui Lan. *Policy Optimization over General State and Action Spaces*. Under second-round review at SIAM Journal on Optimization, Sep 2024.

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*. Pre-print, Jul 2023.

4. **Caleb Ju** and Guanghui Lan. *Dual dynamic programming for stochastic programs over an infinite horizon*. To be submitted to Computational Optimization and Applications, Mar 2023.

5. Yan Li, **Caleb Ju**, Ethan X. Fang, Tuo Zhao. *Implicit regularization of Bregman proximal point algorithm and mirror descent on separable data*. Pre-print, Aug 2021.

AWARDS AND ACHIEVEMENTS

2025 Grid Science Winter School and Conference Travel Grant   2025

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

EXTRACURRICULAR 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

TEACHING EXPERIENCE

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

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

PRESENTATIONS

1. Caleb Ju and Guanghui Lan. *Strongly-Polynomial Time and Validation Analysis of Policy Gradient Methods*. ISyE PhD Student Seminar. 2025.
2. Caleb Ju and Constance Crozier *Learning a Local Trading Strategy: Deep Reinforcement Learning for Grid-scale Renewable Energy Integration*. 2025 Grid Science Winter School and Conference. 2025.
3. Caleb Ju and Guanghui Lan *Strongly-Polynomial Time and Validation Analysis of Policy Gradient Methods*. INFORMS Annual Review. 2024.

4. Caleb Ju, Serif Yesil, Mengyuan Sun, Chandra Chekuri, Edgar Solomnoik *Efficient parallel implementation of the multiplicative weight update method for graph-based linear programs*. SIAM Applied Linear Algebra. 2024.

5. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *A First-Order Method for Solving Linear Quadratic Regulator*. INFORMS Annual Review. 2023.

6. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *A First-Order Method for Solving Linear Quadratic Regulator*. ICSP23. 2023.

7. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *A First-Order Method for Solving Linear Quadratic Regulator*. SIAM OP23. 2023.

8. Caleb Ju. *Dual dynamic programming for solving infinite-horizon stochastic multi-stage programs*. ISyE Student Seminar. 2023.

9. Caleb Ju, Georgios Kotsalis, Guanghui Lan. *Improved Convergence Rates for Linear Quadratic Regulator*. INFORMS Annual Review. 2022.

10. Caleb Ju and Sourabh Dalvi. *Decomposition Methods for Long-Duration Energy Storage*. NREL GPAC Seminar. 2022.

11. Caleb Ju. *Decentralized Distributed Optimization for Sum of Convex Functions*. Summer Argonne Students Symposium (SASSy). 2021.

12. Caleb Ju and Navjot Singh. *Solving Positive LPs in Parallel using the Multiplicative Weights Update (MWU)*. UIUC Parallel Graph Algorithms Reading Group. 2020.

13. Caleb Ju. *Parallel approximate undirected shortest paths via low hop emulators*. UIUC Theory Seminar. 2020.

14. Caleb Ju and Edgar Solomonik. *Bilinear algorithms for convolution*. University of Illinois Summer Presentation Poster Symposium. 2019.

SKILLS

Programming: Python, Julia, C++, C, MATLAB, Java
Libraries/Software: CUDA, NumPy, JuMP, petsc4py, OpenMP, Gurobi, CPLEX, AWS, PyTorch

Last updated: February 2025