Jaewook J. Suh

CONTACT INFORMATION

6100 Main St MS 364, Houston, TX 77005,
Department of Computational Applied Math
and Operations Research,
Rice University

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RESEARCH INTERESTS

Convex Optimization, Computer-Assisted Algorithm Analysis, Adaptive Accelerated Algorithms, Optimization for Machine Learning

RESEARCH EXPERIENCE

Rice University 2024 – Present
Postdoctoral Associate
- Advisor: Professor Shiqian Ma `[website]`

EDUCATION

Seoul National University 2024
Ph.D in Mathematical Sciences
- Advisor: Professor Ernest K. Ryu `[website]`

Seoul National University 2017
B.S. in Mathematics and Physics
Teacher Certification Regulations of Mathematics and Physics

PUBLICATIONS

Published

1. S. P. Boyd, T. Parshakova[*], E. K. Ryu, and **J. J. Suh**[*]. *Optimization Algorithm Design via Electric Circuits.* NeurIPS (spotlight), 2024. [*]Lead authors (author list ordered alphabetically)
   - Top 326/15671=2.1% of papers
2. T. Yoon, J. Kim, **J. J. Suh**, and E. K. Ryu. *Optimal Acceleration for Minimax and Fixed-Point Problems is Not Unique.* ICML (spotlight), 2024.
   - Top 335/9483=3.5% of papers.
3. **J. J. Suh**, J. Park, and E. K. Ryu. *Continuous-time Analysis of Anchor Acceleration.* NeurIPS, 2023.
4. **J. J. Suh**, G. Roh, and E. K. Ryu. *Continuous-time Analysis of Accelerated Gradient Methods via Conservation Laws in Dilated Coordinate Systems.* ICML (long presentation), 2022.
   - Top 118/5630=2% of papers

Preprints

1. **J. J. Suh**, S. Ma. *An Adaptive and Parameter-Free Nesterov's Accelerated Gradient Method for Convex Optimization.* (under review in Mathematical Programming), 2025.
2. J. Park, **J. J. Suh**, B. Wang, A. Bhattacharya, S. Ma. *Adaptive Gradient Descent on Riemannian Manifolds and Its Applications to Gaussian Variational Inference.* (submitted to ICLR), 2025.
3. E. D. H. Nguyen, B. Ying, **J. J. Suh**, X. Jiang. *PEPFlow: A Python Library for the Workflow of Performance Estimation of Optimization Algorithms.* NeurIPS Workshop on GPU-accelerated and Scalable Optimization (to appear), 2025.
4. E. D. H. Nguyen, **J. J. Suh**, X. Jiang, S. Ma. *Exact worst-case convergence rates for Douglas–Rachford and Davis–Yin splitting methods.* (submitted), 2025.
5. R. Park, **J. J. Suh**, Y. Hong, E. K. Ryu. *Numerical Analysis of HiPPO-LegS ODE for Deep State Space Models.* (submitted), 2024.

WORK EXPERIENCE

Intern & App Developer (Android) 2016–2017
AILab, AIBrain

Awards & Honors

Postdoctoral Fellowship Program (Nurturing Next-Generation Researchers), granted by the National Research Foundation of Korea (NRF) — 2024

Google Travel Grant Award to attend ICML — 2022

Excellent Teaching Assistant Award — 2019

National Scholarship for Science and Engineering — 2013

Presentations

PEPFlow: A Python Library for the Workflow of Performance Estimation of Optimization Algorithms.

- Cornell ORIE Young Researchers Workshop (poster) — 2025/10

An Adaptive and Parameter-Free Nesterov's Accelerated Gradient Method for Convex Optimization

- INFORMS Annual Meeting — 2025/10
- International Conference on Continuous Optimization (ICCOPT) — 2025/07

Optimization Algorithm Design via Electric Circuits

- AI-Owls meeting (Rice University) — 2025/03
- Quantitative Methods Seminar (Purdue University) — 2025/03
- KIAS Center for AI and Natural Sciences Seminar — 2025/01
- Neural Information Processing Systems (poster) — 2024/12

Optimization Algorithm Design by Continuous-time Analysis

- KMS Spring Meeting — 2024/04
- UNIST Workshop Optimization & Machine learning — 2023/08

Continuous-time Analysis of Anchor Acceleration

- Neural Information Processing Systems (poster) — 2023/12
- CJ CheilJedang Tech Talk — 2023/07
- AIIS Fall Retreat (poster) — 2022/11

Continuous-time Analysis of AGM via Conservation Laws in Dilated Coordinate Systems

- SIAM Conference on Optimization — 2023/05
- Samsung AI Forum (poster) — 2022/11
- INFORMS Annual Meeting — 2022/10
- International Conference on Machine Learning — 2022/07
- AIIS Spring Retreat (poster) — 2022/04

Teaching

Instructor, Seoul National University

- Exercises in Introduction to Mathematical Analysis I — Spring 2020
- Exercises in Introduction to Mathematical Analysis II — Fall 2020
- Exercises in Calculus I — Spring 2019, Spring 2021
- Exercises in Calculus II — Fall 2018, Fall 2019, Spring 2022
  - Average student course evaluation score: 9.96/10

Teaching Assistant, Seoul National University

- Mathematical Foundations of Deep Neural Networks — Spring 2024
- Calculus for Life Science I — Fall 2023
- Differential Equations — Spring 2023
- Mathematical and Numerical Optimization — Fall 2021, Fall 2022
- Linear Algebra — Spring 2021
- Mathematics for Economics and Business — Spring 2020, Fall 2020
- Introduction to Mathematical Analysis I, II — Spring 2020, Fall 2020
- Engineering Mathematics I, II — Summer 2019, Fall 2019
- Calculus I, II — Fall 2018–Fall 2019, Spring 2021, Spring 2022

Teaching Practicum, Seoul National University Middle School (Physics) 2016/05

- Completed a one-month student teaching experience at a middle school
- Gained hands-on experience in classroom instruction and student engagement

Mentorship

Collaborated with undergraduate interns on research (published at ICML 2022, 2024)

Seoul National University College of Natural Science Camp (TA, Mathematics) 2019/08

Intercollegiate Education Outreach Club Acivity 2012–2014

- Visited various middle and high schools across the region to mentor students
- Provided studying tips on an online website through columns and Q&A
- Served as Club Officer (Fall 2013) and President (Spring 2014)

Professional Services

Reviewer

- Neural Information Processing Systems (NeurIPS)
- International Conference on Learning Representations (ICLR)
- Journal of Optimization Theory and Applications
- Journal of Scientific Computing
- NeurIPS Workshop on GPU-accelerated and Scalable Optimization (ScaleOPT)

Skills

Python, Java, C++, MATLAB, LaTeX, XML