

Junhyung Lyle Kim

Legal name: Junhyung Kim

jlylekim.github.io | [google scholar](#) | [jlylekim](#) | [jlylekim](#) | [jlylekim](#)

Employment

JPMorganChase, Global Technology Applied Research

New York, NY

Quantum Computing Research Scientist — Sr. Associate

Oct 2024 - Present

- Research interests: optimization; quantum algorithms; randomized algorithms; machine learning

Education

Rice University

Houston, TX

Ph.D. in Computer Science

Aug 2019 - Aug 2024

- Advisors: Profs. Anastasios Kyrillidis (chair) [[website](#)]; César A. Uribe [[website](#)]; Nai-Hui Chia [[website](#)]

- Topics: algorithmic and structural acceleration techniques in machine learning and quantum computing [[thesis](#)]

University of Chicago

Chicago, IL

B.A. in Mathematics; B.A. in Statistics

Oct 2013 - Jun 2017

- Advisor: Prof. Panos Toulis [[website](#)]; General Honors; Dean's List 2013-2017

Professional Experience

JPMorganChase, Global Technology Applied Research

New York, NY

Quantum Computing Research Intern; Host: Dr. Marco Pistoia [[website](#)]

Jun 2024 - Aug 2024

- Design, analysis, and application of quantum / quantum-inspired classical algorithms

Mila – Quebec Artificial Intelligence Institute

Montréal, QC

Visiting Student Researcher; Hosts: Profs. Ioannis Mitliagkas and Gauthier Gidel

May 2023 - Aug 2023

- First-order methods for variational inequality in function space / curvature adaptive optimization algorithm

Meta, Fundamental AI Research (FAIR)

New York, NY

AI Research Intern; Host: Dr. Aaron Defazio [[website](#)]

May 2022 - Aug 2022

- Theory and application of adaptive stochastic gradient methods for deep learning

Republic of Korea Special Warfare Training Group (SWTG)

Gyeonggi, South Korea

Sergeant / Aide-de-Camp to the commander of SWTG

Jan 2012 - Oct 2013

- Airborne training (certified paratrooper license #748-416); maritime infiltration training

Academic Experience

Rice University, Computer Science Department

Houston, TX

Ph.D. Candidate; Advisors: Profs. Anastasios Kyrillidis, César A. Uribe, and Nai-Hui Chia

Aug 2019 - Aug 2024

- Active collaborations with Google (F. Pedregosa) and IBM (G. Kollias) on optimization and quantum computing
- Internships at Meta (FAIR), MILA – Quebec AI Institutue, and JPMorganChase (quantum computing)

University of Chicago, Booth School of Business

Chicago, IL

Research Assistant; Supervisors: Profs. Panos Toulis and Sanjog Misra

Jun 2017 - Jul 2019

- Stochastic approximation for large-scale inverse reinforcement learning

- Uncertainty quantification for high-energy physics unfolding problem; [code]; [documentation]

Publications

(* denotes equal contributions)

Journal Papers

- [J1] How Much Pre-training Is Enough to Discover a Good Subnetwork?
C. Wolfe*, F. Liao*, Q. Wang, **J. L. Kim**, A. Kyrillidis
Transactions on Machine Learning Research, TMLR 2024
- [J2] When is Momentum Extragradient Optimal? A Polynomial-Based Analysis
J. L. Kim, G. Gidel, A. Kyrillidis, F. Pedregosa
Transactions on Machine Learning Research, TMLR 2024
Workshop on Optimization for Machine Learning, NeurIPS 2022
- [J3] Fast Quantum State Reconstruction via Accelerated Non-Convex Programming
J. L. Kim, G. Kollias, A. Kalev, K.X. Wei, A. Kyrillidis
Photonics 2023
- [J4] Local Stochastic Factored Gradient Descent for Distributed Quantum State Tomography
J. L. Kim, M. T. Toghani, C. A. Uribe, A. Kyrillidis
Control Systems Letters, L-CSS 2022

Conference Papers (peer-reviewed)

- [C1] A Catalyst Framework for the Quantum Linear System Problem via the Proximal Point Algorithm
J. L. Kim, N. H. Chia, A. Kyrillidis
AAAI Conference on Artificial Intelligence, AAAI 2026 (Oral)
- [C2] Fast Zeroth-Order Convex Optimization with Quantum Gradient Methods
J. L. Kim*, B. Augustino*, D. Herman*, E. Fontana*, J. Watkins, M. Pistoia, S. Chakrabarti
Advances in Neural Information Processing Systems, NeurIPS 2025
- [C3] Solving Hidden Monotone Variational Inequalities with Surrogate Losses
R. D'Orazio, D. Vucetic, Z. Liu, **J. L. Kim**, I. Mitliagkas, G. Gidel
International Conference on Learning Representations, ICLR 2025
Workshop on Optimization for Machine Learning, NeurIPS 2024
- [C4] On the Error-Propagation of Inexact Hotelling's Deflation for Principal Component Analysis
F. Liao, **J. L. Kim**, C. Barnum, A. Kyrillidis
International Conference on Machine Learning, ICML 2024
- [C5] Adaptive Federated Learning with Auto-Tuned Clients
J. L. Kim, M. T. Toghani, C. A. Uribe, A. Kyrillidis
International Conference on Learning Representations, ICLR 2024
Workshop on Federated Learning and Analytics in Practice, ICML 2023
- [C6] Convergence and Stability of the Stochastic Proximal Point Algorithm with Momentum
J. L. Kim, P. Toulis, A. Kyrillidis
Conference on Learning for Dynamics and Control, L4DC 2022
Workshop on Optimization for Machine Learning, NeurIPS 2021 (Spotlight)

Preprints

(* denotes equal contributions)

- [P1] Smoothness-Adaptive Sharpness-Aware Minimization for Finding Flatter Minima
H. Naganuma*, **J. L. Kim***, A. Kyriolidis, I. Mitliagkas
Workshop on Practical Machine Learning for Low Resource Settings, ICLR 2024
- [P2] On Speedups for Convex Optimization via Quantum Dynamics
S. Chakrabarti*, D. Herman*, J. Watkins*, E. Fontana, B. Augustino, **J. L. Kim**, M. Pistoia
QSim 2025
- [P3] A Simple Analysis of a Quantum-Inspired Algorithm for Solving Low-Rank Linear Systems
T. Chen*, **J. L. Kim***, A. Ray*, S. Chakrabarti, D. Herman, N. Kumar
- [P4] Mechanisms for Quantum Advantage in Global Optimization of Nonconvex Functions
G. Ozgul*, D. Herman*, A. Apte, **J. L. Kim**, A. Prakash, J. Shen, S. Chakrabarti
QIP 2026
- [P5] Fault-Tolerant End-to-end Quantum Algorithms for Tensors
E. Fontana, S. Prasad, **J. L. Kim**, J. Sullivan, M. Perlin, R. Shadlyn, S. Chakrabarti

Honors & Awards

- 2025 NeurIPS 2025 Top Reviewer (complimentary registration)
2025 ICLR 2025 Notable Reviewer
2024 Rice Engineering Alumni Graduate Student Spring Travel Grant (\$540)
2023 Rice Engineering Alumni Graduate Student Fall Travel Grant (\$480)
2023 AISTATS 2023 Top Reviewer (Top 10 %, complimentary registration)
2022 Rice Engineering Alumni Graduate Student Fall Travel Grant (\$1,200)
2022 Rice Engineering Alumni Graduate Student Spring Travel Grant (\$960)
2021 Spotlight paper, Workshop on Optimization for Machine Learning (NeurIPS 2021)
2021 Rice Engineering Alumni Graduate Student Fall Travel Grant (\$1,900)

Service

- Workshops** QuantIPS 2023: Co-organizer for "Quantum Information Processing Systems" [[link](#)]
TL;DR 2023: Co-organizer for "Texas Colloquium on Distributed Learning" [[link](#)]
ICML 2021: Co-organizer for "Beyond First Order Methods in Machine Learning Systems" [[link](#)]
- Reviews** Quantum, TMLR, NeurIPS, ICML, ICLR, AISTATS, CDC (2022), NECSYS (2022), TCNS (2022)

Mentorship

Undergraduate students

Co-advised with Prof. Anastasios Kyriolidis

- Rithik Jain (Rice University): sparse learning with hadamard product Mar 2021 - May 2022
- Justin Lumpkin (U of Maryland): deep matrix factorization; Google/Rice REU 1st place May 2021 - Aug 2021
- Cruz Barnum (Reed College): scalable streaming PCA; Google/Rice REU 2nd place May 2021 - Aug 2021

Others

- Leadership** President, Rice University Computer Science Graduate Student Association (2022 - 2023)
President, UChicago Korean Undergraduate Maroon Association (2016 - 2017)
- Software** MiFGD (Python) [[link](#)], sgd (R package) [[link](#)], UndersmoothedUnfolding (C++) [[link](#)]
- Language** Korean (native), English (bilingual proficiency)

Invited Talks

Adaptive Federated Learning with Auto-Tuned Clients <i>Annual Meeting, INFORMS</i>	Phoenix, AZ Oct 2023
Adaptive Federated Learning with Auto-Tuned Clients <i>Montréal Machine Learning and Optimization (MTL MLOpt), MILA</i>	Montréal, Canada Jun 2023
Local Stochastic Factored Gradient Descent for Distributed Quantum State Tomography <i>IEEE Conference on Decision and Control (CDC)</i>	Cancún, Mexico Dec 2022
Convergence and Stability of the Stochastic Proximal Point Algorithm with Momentum <i>Optimization for Machine Learning, INFORMS</i>	Indianapolis, IN Oct 2022
Convergence and Stability of the Stochastic Proximal Point Algorithm with Momentum <i>International Conference on Continuous Optimization (ICCOPT)</i>	Bethlehem, PA Jul 2022
Fast Quantum State Reconstruction via Accelerated Non-Convex Programming <i>Quantum Group Meeting Seminar, Rice University</i>	Houston, TX Jan 2022
Acceleration and Stability of the Stochastic Proximal Point Algorithm <i>Workshop on Optimization for Machine Learning, NeurIPS</i>	Virtual Dec 2021
Fast Quantum State Reconstruction via Accelerated Non-Convex Programming <i>Optimization in Quantum Computing, INFORMS</i>	Anaheim, CA Oct 2021

Other Experience

Dimensional Fund Advisors	Austin, TX
Research Intern, Investment Analytics & Data Group	Jun 2016 - Sep 2016
• Automated checking system development for security database; VBA tool for data comparison and visualization	
Cook M&A Advisory Services	Chicago, IL
Investment Banking Summer Analyst	Jun 2015 - Aug 2015
• Data analysis for several buy-side projects; client document drafting	
Freenters, Inc.	Chicago, IL
Operations Intern	Aug 2014 - Jan 2015
• VBA tool for automatically personalized email dispatching; logo/poster design (Adobe Illustrator)	