

Junhyung Lyle Kim

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Education

Rice University

Ph.D. in Computer Science

Houston, TX

Aug 2019 - Present

- Advisor: Prof. Anastasios Kyrillidis [website]
- Research interests: optimization; distributed optimization; quantum computing; machine learning

University of Chicago

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

Chicago, IL

Jun 2017

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

Research Experience

Rice University, Computer Science Department

Ph.D. student working with Prof. Anastasios Kyrillidis

Houston, TX

Aug 2019 - Present

- Efficient quantum state tomography with non-convex and distributed optimization methods
- Accelerating implicit methods for robust and fast optimization

University of Chicago, Booth School of Business

Research Assistant to Profs. Panos Toulis and Sanjog Misra

Chicago, IL

Jun 2017 - Jul 2019

- Stochastic approximation for large-scale inverse reinforcement learning

University of Chicago, Statistics Department

Research Assistant to Prof. Mikael Kuusela; Supervisor: Prof. Michael L. Stein

Chicago, IL

Oct 2016 - Jun 2017

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

Publications

- [1] **J. L. Kim**, P. Toulis, A. Kyrillidis, "Acceleration and stability of the stochastic proximal point algorithm"
Workshop on Optimization for Machine Learning, NeurIPS 2021 (Spotlight)

Papers Under Review

- [1] **J. L. Kim**, G. Kollias, A. Kalev, K. X. Wei, A. Kyrillidis, "Fast quantum state reconstruction via accelerated non-convex programming"
- [2] **J. L. Kim**, P. Toulis, A. Kyrillidis, "Convergence and stability of the stochastic proximal point algorithm with momentum"
- [3] **J. L. Kim**, J. A. Lara Benitez, M. T. Toghani, C. Wolfe, Z. Zhang, A. Kyrillidis "Momentum-inspired low-rank coordinate descent for diagonally constrained SDPs"
- [4] C. Wolfe, Q. Wang, **J. L. Kim**, A. Kyrillidis "Provably efficient lottery ticket discovery"

Working Papers

- [1] **J. L. Kim**, M. T. Toghani, C. A. Uribe, A. Kyrillidis, "Large-scale quantum state tomography via distributed optimization"
- [2] **J. L. Kim**, S. Misra, P. Toulis, "Exact inference of large-scale inverse reinforcement learning with stochastic gradient descent"
- [3] **J. L. Kim**, M. Kuusela, "Debiased uncertainty quantification in unfolding elementary particle spectra at the Large Hadron Collider"

Invited Talks

Acceleration and stability of the stochastic proximal point algorithm

Workshop on Optimization for Machine Learning, NeurIPS

Virtual

Dec 2021

Fast quantum state reconstruction via accelerated non-convex programming

Optimization in Quantum Computing, INFORMS

Anaheim, CA

Oct 2021

Honors & Awards

2021 Rice Engineering Alumni Graduate Student Travel Grant (\$1,900)

Others

Software MiFGD (Python) [link], sgd (R package) [link], UndersmoothedUnfolding (C++) [link]
Programming Python, R, C++, Matlab, ROOT (CERN)
Language Korean (native), English (bilingual proficiency)

Services

Workshop ICML (2021): co-organizer for “Beyond first order methods in machine learning systems” [link]

Review AISTATS (2022): reviewer

Mentorships

Undergraduate students

Co-advised with Prof. Anastasios Kyrillidis

- Rithik Jain (Rice University): sparse learning with hadamard product Mar 2021 - Present
- 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

Professional Experience

Dimensional Fund Advisors

Research Intern, Investment Analytics & Data Group

Austin, TX

Jun 2016 - Sep 2016

- Automated checking system for security database; prototyping VBA tool for data comparison

Cook M&A Advisory Services

Investment Banking Summer Analyst

Chicago, IL

Jun 2015 - Aug 2015

- Data analysis for several buy-side projects; client document drafting

Freenters, Inc.

Operations Intern

Chicago, IL

Aug 2014 - Jan 2015

- VBA tool for automatically personalized email dispatching; logo/poster design (Adobe Illustrator)

Republic of Korea Special Warfare Training Group (SWTG)

Special Forces Sergeant / Aide-de-Camp to Commander of SWTG

Gyeonggi, South Korea

Jan 2012 - Oct 2013

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