

# Junhyung Lyle Kim

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## Education

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### 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

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### 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

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- [1] **J. L. Kim**, P. Toulis, A. Kyrillidis, "Convergence and stability of the stochastic proximal point algorithm with momentum" *Proceedings of the 4th Conference on Learning for Dynamics and Control, PMLR 2022 (forthcoming)*
- [2] **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

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- [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**, J. A. Lara Benitez, M. T. Toghani, C. Wolfe, Z. Zhang, A. Kyrillidis "Momentum-inspired low-rank coordinate descent for diagonally constrained SDPs"
- [3] C. Wolfe, Q. Wang, **J. L. Kim**, A. Kyrillidis "Provably efficient lottery ticket discovery"

## Working Papers

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- [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"

## Invited Talks

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Fast quantum state reconstruction via accelerated non-convex programming <i>Quantum Group Meeting Seminar, Rice University</i>	<i>Houston, TX Jan 2022</i>
Acceleration and stability of the stochastic proximal point algorithm <i>Workshop on Optimization for Machine Learning, NeurIPS</i>	<i>Virtual Dec 2021</i>
Fast quantum state reconstruction via accelerated non-convex programming <i>Optimization in Quantum Computing, INFORMS</i>	<i>Anaheim, CA Oct 2021</i>

## Honors & Awards

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

## Others

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

## Service

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**Workshop** ICML (2021): co-organizer for “Beyond first order methods in machine learning systems” [link]  
**Review** AISTATS (2022): reviewer

## Mentorship

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### 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

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### 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