Yunbum Kook

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Research Interest

Algorithms, Optimization, Machine Learning, and Data Mining

Education

09/2021 – **Georgia Institute of Technology**, GA, United States
- Ph.D. in Computer Science

03/2015 – 08/2021 **Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, Korea
- B.S. in Mathematical Sciences (Advanced program) & Graduation with Honor (Summa Cum Laude)
- Left for mandatory military service (Jan 2017–Oct 2018)

03/2012 – 02/2015 **Korea Science Academy of KAIST (KSA)**, Busan, Korea
- Graduated as salutatorian in mathematics; Graduated with distinction in GPA

Publications

Preprint

[1] Sampling with Riemannian Hamiltonian Monte Carlo in a Constrained Space
with Yin Tat Lee, Ruoqi Shen, Santosh S. Vempala
Available at arXiv

Conferences

[1] Vertex Sparsification for Edge Connectivity
with Parinya Chalermsook, Syamantak Das, Bundit Laekhanukit, Yang P. Liu, Richard Peng, Mark Sellke, Daniel Vaz
SODA 2021, available at DOI:10.1137/1.9781611976465.74

[2] Evolution of Real-world Hypergraphs: Patterns and Models without Oracles (full)
Yunbum Kook, Jihoon Ko, Kijung Shin
IEEE ICDM 2020, available at DOI:10.1109/ICDM50108.2020.00036 (*Selected as one of the best papers for possible publication in the Knowledge and Information Systems (KAIS) Journal, Springer*)

[3] Incremental Lossless Graph Summarization
Yunbum Kook*, Jihoon Ko*, Kijung Shin
KDD 2020, available at DOI:10.1145/3394486.3403074

Talks

01/2021 Vertex Sparsification for Edge Connectivity, SODA 2021, Virtual
11/2020 Evolution of Real-world Hypergraphs: Patterns and Models without Oracles, IEEE ICDM 2020, Virtual
08/2020 Incremental Lossless Graph Summarization, KDD 2020, Virtual
08/2020 Vertex Sparsification for Edge Connectivity, *Discrete Math Seminar*, IBS Discrete Mathematics Group, Daejeon, Korea

Honors & Awards

Scholarships/Fellowships

08/2020 **KFAS Graduate Scholarship**, Korea Foundation for Advanced Studies
- For graduate study abroad (4 students selected in CS nationwide) ($20,000/year)

06/2020 – 08/2021 **General Alumni Scholarship**, KAIST Alumni Association
- For undergraduate study ($16,000 + mentorship by prominent alumni of KAIST)

03/2020 **Department Senior Scholarship**, Dept. of Mathematical Science, KAIST

- Awarded to the top student in a previous semester

03/2019 – 08/2021 **KFAS Undergraduate Scholarship**, Korea Foundation for Advanced Studies
- For undergraduate study (4 students selected in Mathematics nationwide) ($8,500)

03/2015 – 08/2021 **KAIST Presidential Fellowship (KPF)**, KAIST
- Granted to top 3% students. Grantees choose a mentor professor for academic consultation, join KPF honor society, and receive financial support for research and academic travels ($30,000)
- KPF Mentor: Prof. Sang-il Oum

03/2015 – 12/2016 **National Science & Technology Scholarship**, Korea Student Aid Foundation

Others

11/2020 **Best Paper Candidate for KAIS Publication**, IEEE ICDM 2020

10/2020 **Patent**, Korean Patent Application 10-2020-0087574
- With Jihoon Ko and Kijung Shin, "Electronic Device for Incremental Lossless Summarization of Massive Graphs and Operation Method Thereof"

06/2019 **Undergraduate Research Program**, KAIST
- Research grant for project "Graph summarization for dynamic graphs" ($5,000)

2019, 2015 **Dean's List**, KAIST
- Dept. of Mathematical Sciences, KAIST (Spring 2019)
- School of Freshmen, KAIST (Spring 2015)

12/2018 **Silver**, The College Students Mathematics Competition, Korean Mathematical Society

08/2016 **1st Prize**, KAIST Math Problem of the Week
- Weekly math problem challenges run by Dept. of Mathematical Sciences during each semester

Teaching & Work Experience

Spring 2019 **Teaching Assistant**, Linear Algebra (MAS212), KAIST

12/2018 – 02/2019 **Machine Learning Engineer Intern**, Kakao Corporation, Seongnam, Korea
- Enhance a large-scale recommendation system for *Brunch* service via solving contextual multi-armed bandit (MAB) problems; offered a full-time position

01/2017 – 10/2018 **Korean Augmentation to the U.S. Army**, Republic of Korea Army

Fall 2016 **Undergraduate T.A.**, Calculus II (MAS102), KAIST

Last Updated: 02/2022