

YUNYONG KO

Postdoctoral Research Fellow @ UIUC

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RESEARCH INTERESTS

Large-scale data mining and machine learning on various types of data (e.g., graph, text, image) for real-world applications to social networks analysis, recommender systems, and information retrieval.

EDUCATION

Hanyang University

Seoul, Republic of Korea

- *Ph.D. in Computer Science*

Sep. 2013 – Aug. 2021

- Thesis: Effective Approaches to Distributed Deep Learning: Methods, Analyses, and Evaluation

- Advisor: Prof. Sang-Wook Kim

- *B.S. in Computer Science*

Mar. 2009 – Aug. 2013

RESEARCH EXPERIENCES

University of Illinois at Urbana-Champaign

IL, USA

- *Postdoctoral Researcher, Department of Computer Science*

May. 2022 – Present

- Topic: Large-Scale Machine Learning on Real-World Hypergraphs

- Advisor: Prof. Hanghang Tong

Hanyang University

Seoul, Republic of Korea

- *Postdoctoral Researcher, Department of Computer Science*

Sep. 2021 – April. 2022

- Topic: Optimization Technique for Large-Batch DNN Training

- Advisor: Prof. Sang-Wook Kim

The Pennsylvania State University

University Park, PA, USA

- *Visiting Scholar, College of Information Sciences and Technology*

Oct. 2019 – Feb. 2020

- Topic: Data Parallelism Approach for Distributed Deep Learning

- Advisor: Prof. Dongwon Lee

PUBLICATIONS

Refereed Conference and Journal Papers (* indicates equal contributions)

- [12] KHAN: Knowledge-Aware Hierarchical Attention Networks for Accurate Political Stance Prediction
Yunyong Ko, Seongeun Ryu, Soeun Han, Youngseung Jeon, Jaehoon Kim, Sohyun Park, Kyungsik Han,
Hanghang Tong and Sang-Wook Kim
WWW 2023 (*The ACM Web Conference*)
Full Paper (Acceptance Rate $\approx 19.2\%$)
- [11] RealGraph^{GPU}: A High-Performance GPU-Based Graph Engine Toward Large-Scale Real-World
Network Analysis
Myung-Hwan Jang, Yunyong Ko, Dongkyu Jeong, Jeong-Min Park, and Sang-Wook Kim
ACM CIKM 2022 (*The ACM International Conference on Information and Knowledge Management*)
Short Paper (Acceptance Rate $\approx 28.3\%$)
- [10] Not All Layers Are Equal: A Layer-Wise Adaptive Approach Toward Large-Scale DNN Training
Yunyong Ko, Dongwon Lee, and Sang-Wook Kim
WWW 2022 (*The ACM Web Conference*)
Full Paper (Acceptance Rate $\approx 17.7\%$)

- [9] D-FEND: A Diffusion-Based Fake News Detection Framework for News Articles Related to COVID-19
Soeun Han, Yunyong Ko, Yusim Kim, Heejin Park, Seongsu Oh, and Sang-Wook Kim
ACM SAC 2022 (*The ACM Symposium on Applied Computing*)
Full Paper (Acceptance Rate $\approx 24\%$)
- [8] SHAT: A Novel Asynchronous Training Algorithm That Provides Fast Model Convergence in Distributed Deep Learning
Yunyong Ko, and Sang-Wook Kim
Applied Sciences 2022 (SCIE, IF: 2.679)
- [7] MASCOT: A Quantization Framework for Efficient Matrix Factorization in Recommender Systems
{Yunyong Ko*, Jae-Seo Yu*}, Hong-Kyun Bae, Yongjun Park, Dongwon Lee, and Sang-Wook Kim
IEEE ICDM 2021 (*The IEEE International Conference on Data Mining*)
Full Paper (Acceptance Rate $\approx 9.9\%$)
Selected as One of the Best-ranked Papers of ICDM 2021 for Fast-track Journal Invitation
- [6] ALADDIN: Asymmetric Centralized Training for Distributed Deep Learning
Yunyong Ko, Kibong Choi, Hyunseung Jei, Dongwon Lee, and Sang-Wook Kim
ACM CIKM 2021 (*The ACM International Conference on Information and Knowledge Management*)
Full Paper (Acceptance Rate $\approx 21.7\%$)
Selected as One of the Spotlight Presentations of CIKM 2021
- [5] An In-Depth Analysis of Distributed Training of Deep Neural Networks
Yunyong Ko, Kibong Choi, Jiwon Seo, and Sang-Wook Kim
IEEE IPDPS 2021 (*The IEEE International Parallel and Distributed Processing Symposium*)
Full Paper (Acceptance Rate $\approx 24.5\%$)
- [4] Influence Maximization for Effective Advertisement in Social Networks: Problem, Solution, and Evaluation
Suk-Jin Hong, Yunyong Ko, Moon-Jeung Joe, and Sang-Wook Kim
ACM SAC 2019 (*The ACM Symposium on Applied Computing*)
Full Paper (Acceptance Rate $\approx 24.2\%$)
- [3] Efficient and Effective Influence Maximization in Social Networks: A Hybrid-Approach
{Yunyong Ko*, Kyung-Jae Cho*}, and Sang-Wook Kim
Information Sciences 2018 (SCIE, IF: 6.795)
- [2] Influence Maximization in Social Networks: A Target-Oriented Estimation
Yunyong Ko, Dong-Kyu Chae, and Sang-Wook Kim
Journal of Information Science 2018 (SCIE, IF: 3.282)
- [1] Accurate Path-Based Influence Maximization in Social Networks
Yunyong Ko, Dong-Kyu Chae, and Sang-Wook Kim
WWW 2016 (*The ACM Web Conference*)
Short Paper (Acceptance Rate $\approx 21\%$)

AWARDS
& HONORS

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| Selected as One of the Best-Ranked Papers of IEEE ICDM
• IEEE International Conference on Data Mining (IEEE ICDM) | 2021 |
| Selected as One of the Spotlight Presentations of ACM CIKM
• ACM International Conference on Information and Knowledge Management (ACM CIKM) | 2021 |

	Received the Outstanding Ph.D. Dissertation Award	2021
	• Research Institute of Industrial Science, Hanyang University	
	Received the Best Paper Award ,	2021
	• Korea Information Processing Society (KIPS)	
	Received the ACM SIGAPP Student Travel Award	2019
	• ACM Symposium on Applied Computing (ACM SAC)	
	Awarded the Naver Ph.D. Fellowship	2017
	• Naver Corporation	
	Received the Best Presentation Award	2017
	• Korea Computer Congress (KCC)	
INVITED TALKS	METU-HYU Joint Workshop , Online	Dec. 2022
	• Topic: Not All Layers Are Equal: A Layer-Wise Approach Towards Large-Scale DNN Training	
	Medical AI Korea , Seoul, Republic of Korea	Oct. 2021
	• Topic: Basic Concept of Distributed Deep Learning with PyTorch Tutorials	
PROFESSIONAL SERVICES	Track Co-Chair	
	• The ACM Symposium on Applied Computing (ACM SAC)	2023
	Conference Reviewer	
	• The ACM Web Conference (WWW)	2023
	• The ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)	2021, 2022
	• The IEEE International Conference on Data Mining (IEEE ICDM)	2022
	• The AAAI International Conference on Artificial Intelligence (AAAI)	2021
	• The ACM Symposium on Applied Computing (ACM SAC)	2022, 2023
PATENTS	International Patents	
	• Asymmetric Centralized training for Distributed Deep Learning (PCT application) Application number: PCT/KR2021/015014	Oct. 2021
	Domestic Patents	
	• A Layer-Wise Adaptive Approach toward Large-Scale DNN Training Application number: 10-2022-0075800	June. 2022
	• Multi-State Diffusion Model using Interest, Intimacy, and Share Tendency Registration number: 10-2332348	Dec. 2020
	• Accurate Ad-Effect Estimation Method based on Relevance between User and Item Registration number: 10-2144122	Aug. 2020
	• Influence Maximization in Social Networks: A Hybrid Approach Registration number: 10-1810864	Dec. 2017
REFERENCES	Hanghang Tong , <i>Associate Professor</i> (Postdoc. Adviser) <i>Department of Computer Science</i> , University of Illinois at Urbana-Champaign (UIUC)	htong@illinois.edu

Sang-Wook Kim, *Professor* (Ph.D. Adviser)
Department of Computer Science, Hanyang University

wook@hanyang.ac.kr

Dongwon Lee, *Professor* (Collaborator)
College of Information Sciences and Technology, The Pennsylvania State University (PSU)

dongwon@psu.edu

Kyungsik Han, *Associate Professor* (Collaborator)
Department of Computer Science, Hanyang University

kyungsikhan@hanyang.ac.kr