

# YUNYONG KO

Postdoctoral Researcher @ 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*

## WORK 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 Researcher, 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<sup>GPU</sup>: 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  
So-Eun 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 <b>Best-Ranked Papers of IEEE ICDM</b><br>• IEEE International Conference on Data Mining (IEEE ICDM)                            | 2021 |
| Selected as One of the <b>Spotlight Presentations of ACM CIKM</b><br>• ACM International Conference on Information and Knowledge Management (ACM CIKM) | 2021 |

	Received the <b>Outstanding Ph.D. Dissertation Award</b>	2021
	• Research Institute of Industrial Science, Hanyang University	
	Received the <b>Best Paper Award</b> ,	2021
	• Korea Information Processing Society (KIPS)	
	Received the <b>ACM SIGAPP Student Travel Award</b>	2019
	• ACM Symposium on Applied Computing (ACM SAC)	
	Awarded the <b>Naver Ph.D. Fellowship</b>	2017
	• Naver Corporation	
	Received the <b>Best Presentation Award</b>	2017
	• Korea Computer Congress (KCC)	
INVITED TALKS	<b>METU-HANYANG Joint Workshop</b> , Online	Dec. 2022
	• Topic: Not All Layers Are Equal: A Layer-Wise Approach Towards Large-Scale DNN Training	
	<b>Medical AI Korea</b> , Seoul, Republic of Korea	Oct. 2021
	• Topic: Basic Concept of Distributed Deep Learning with PyTorch Tutorials	
PROFESSIONAL SERVICES	<b>Track Co-Chair</b>	
	• ACM Symposium on Applied Computing (ACM SAC)	2023
	<b>Conference Reviewer</b>	
	• ACM Web Conference (WWW)	2023
	• ACM SIGKDD Conference on Knowledge Discovery and Data Mining (ACM KDD)	2021, 2022
	• IEEE International Conference on Data Mining (ICDM)	2022
	• AAAI International Conference on Artificial Intelligence (AAAI)	2021
	• ACM Symposium on Applied Computing (ACM SAC)	2022, 2023
PATENTS	<b>International Patents</b>	
	• Asymmetric Centralized training for Distributed Deep Learning (PCT application) Application number: PCT/KR2021/015014	Oct. 2021
	<b>Domestic Patents</b>	
	• 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