

# YUNYONG KO

Postdoctoral Research Fellow @ UIUC

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RESEARCH INTERESTS	My research interests lie in large-scale data mining and machine learning on various types of data (e.g., graph, hypergraph, text, and image), with a focus on developing AI/ML solutions for real-world problems.	
EDUCATION	<b>Hanyang University</b>	Seoul, Republic of Korea
	• <i>Ph.D. in Computer Science</i>	<i>Sep. 2013 – Aug. 2021</i>
	– Thesis: Effective Approaches to Distributed Deep Learning: Methods, Analyses, and Evaluation – Advisor: Prof. Sang-Wook Kim	
	• <i>B.S. in Computer Science</i>	<i>Mar. 2009 – Aug. 2013</i>
RESEARCH EXPERIENCES	<b>University of Illinois at Urbana-Champaign</b>	Urbana, IL, USA
	• <i>Postdoctoral Researcher, Department of Computer Science</i>	<i>May. 2022 – Present</i>
	– Topic: Large-Scale Hypergraph Learning for Real-World Applications – Advisor: Prof. Hanghang Tong	
	<b>Hanyang University</b>	Seoul, Republic of Korea
	• <i>Postdoctoral Researcher, Department of Computer Science</i>	<i>Sep. 2021 – April. 2022</i>
	– Topic: Optimization Technique for Large-Batch DNN Training – Advisor: Prof. Sang-Wook Kim	
PUBLICATIONS	<b>The Pennsylvania State University</b>	University Park, PA, USA
	• <i>Visiting Scholar, College of Information Sciences and Technology</i>	<i>Oct. 2019 – Feb. 2020</i>
	– Topic: Data Parallelism Approach for Distributed Deep Learning – Advisor: Prof. Dongwon Lee	
	<b>Refereed Conference and Journal Papers</b> (* 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 <b>WWW 2023</b> ( <i>The ACM Web Conference</i> ) 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 <b>ACM CIKM 2022</b> ( <i>The ACM International Conference on Information and Knowledge Management</i> ) 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 <b>WWW 2022</b> ( <i>The ACM Web Conference</i> ) 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** (SCIE Journal, 2022)
- [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** (SCIE Journal, 2018)
- [2] Influence Maximization in Social Networks: A Target-Oriented Estimation  
Yunyong Ko, Dong-Kyu Chae, and Sang-Wook Kim  
**Journal of Information Science** (SCIE Journal, 2018)
- [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  
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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-HYU 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>	
	• The ACM Symposium on Applied Computing (ACM SAC)	2023
	<b>Conference Reviewer</b>	
	• The ACM Web Conference ( <b>WWW</b> )	2023
	• The ACM SIGKDD Conference on Knowledge Discovery and Data Mining ( <b>KDD</b> )	2021, 2022
	• The IEEE International Conference on Data Mining ( <b>IEEE ICDM</b> )	2022
	• The AAAI International Conference on Artificial Intelligence ( <b>AAAI</b> )	2021
	• The ACM Symposium on Applied Computing ( <b>ACM SAC</b> )	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
REFERENCES	<b>Hanghang Tong</b> , <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*

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

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

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