

# Yunyong Ko

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Research Interests	My research interest lies in 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	<b>Hanyang University</b> , Seoul, Korea • Ph.D. in Computer Science • Thesis: “Effective Approaches to Distributed Deep Learning: Methods, Analyses, and Evaluation” • Advisor: Prof. Sang-Wook Kim	Sep. 2013 – Aug. 2021
	<b>Hanyang University</b> , Seoul, Korea • B.S. in Computer Science	Mar. 2009 – Aug. 2013
Work Experiences	<b>University of Illinois at Urbana-Champaign</b> , IL, USA • Postdoctoral Researcher, Department of Computer Science • Topic: Large-Scale Machine Learning on Real-World Hypergraphs • Advisor: Prof. Hanghang Tong	May. 2022 – Present
	<b>Hanyang University</b> , Seoul, Korea • Postdoctoral Researcher, Department of Computer Science • Topic: Optimization Technique for Large-Batch DNN Training • Advisor: Prof. Sang-Wook Kim	Sep. 2021 – April. 2022
	<b>The Pennsylvania State University</b> , University Park, PA, USA • Visiting Researcher, College of Information Sciences and Technology (IST) • Topic: Data Parallelism Approach for Distributed Deep Learning • Advisor: Prof. Dongwon Lee	Oct. 2019 – Feb. 2020
Publications	<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  
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	Selected as One of the <b>Best-Ranked Papers of IEEE ICDM</b> • IEEE International Conference on Data Mining	2021
	Selected as One of the <b>Spotlight Presentations of ACM CIKM</b> • ACM International Conference on Information and Knowledge Management	2021
	Received the <b>Outstanding Ph.D. Dissertation Award</b> • Research Institute of Industrial Science, Hanyang University	2021

	Received the <b>Best Paper Award</b> • Korea Information Processing Society	2021
	Received the <b>ACM SIGAPP Student Travel Award</b> • ACM Symposium on Applied Computing	2019
	Awarded the <b>Naver Ph.D. Fellowship</b> • Naver Corporation	2017
	Received the <b>Best Presentation Award</b> • Korea Computer Congress	2017
Professional Services	<b>Track Co-Chair</b> • ACM Symposium on Applied Computing (ACM SAC)	2023
	<b>Conference Reviewer</b> • ACM Web Conference (WWW) • ACM SIGKDD Conference on Knowledge Discovery and Data Mining (ACM KDD) • IEEE International Conference on Data Mining (ICDM) • AAAI International Conference on Artificial Intelligence (AAAI) • ACM Symposium on Applied Computing (ACM SAC)	2023 2021, 2022 2022 2021 2022, 2023
Invited Talks	<b>Not All Layers Are Equal: A Layer-Wise Approach Towards Large-Scale DNN Training</b> • Invited Talk @ METU-HANYANG Joint Workshop, Dec. 2022  <b>Basic Concept of Distributed Deep Learning with PyTorch Tutorials</b> • Invited Talk @ Medical AI Korea, Oct. 2021	
Patents	<b>International Patents</b> • <b>Asymmetric Centralized training for Distributed Deep Learning</b> (PCT application) Application number: PCT/KR2021/015014, Date: Oct. 2021  <b>Domestic Patents</b> • <b>A Layer-Wise Adaptive Approach toward Large-Scale DNN Training</b> Application number: 10-2022-0075800, Date: June. 2022 • <b>Multi-State Diffusion Model using Interest, Intimacy, and Share Tendency</b> Registration number: 10-2332348, Date: Dec. 2020 • <b>Accurate Ad-Effect Estimation Method based on Relevance between User and Item</b> Registration number: 10-2144122, Date: Aug. 2020 • <b>Influence Maximization in Social Networks: A Hybrid Approach to Solving Performance Issues in Micro and Macro Levels</b> Registration number: 10-1810864, Date: Dec. 2017	