

Yunyong Ko

Contact Information	Room #4219, Siebel Center 201 N Goodwin Ave Urbana, IL 61801, USA	Phone: 217-200-0120 Email: yyko@illinois.edu Homepage: https://yy-ko.github.io
Research Interests	Data mining, Graph Mining, Large-scale machine learning, Recommender systems	
Education	Hanyang University , Seoul, Korea • Ph.D. in Computer Science • Thesis: “Effective Approaches to Distributed Deep Learning: Methods, Analyses, and Evaluation” • Advisor: Prof. Sang-Wook Kim Hanyang University , Seoul, Korea • B.S. in Computer Science	Sep. 2013 – Aug. 2021 Mar. 2009 – Aug. 2013
Experiences	University of Illinois at Urbana-Champaign , IL, USA • Postdoctoral Researcher, Department of Computer Science • Topic: Hypergraph Representation Learning for Hyperedge Prediction • Advisor: Prof. Hanghang Tong Hanyang University , Seoul, Korea • Postdoctoral Researcher, Department of Computer Science • 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 (IST) • Topic: Data Parallelism Approach to Distributed Deep Learning: Analysis and Algorithm • Advisor: Prof. Dongwon Lee	May. 2022 – Present Oct. 2019 – Feb. 2020
Publications (Selected)	Refereed Conference Papers (* indicates equal contributions) [c.9] 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 The ACM Web Conference (WWW 2023) Full Paper (Acceptance Rate $\approx 19.2\%$) [c.8] 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 The ACM International Conference on Information and Knowledge Management (ACM CIKM 2022) Short Paper (Acceptance Rate $\approx 28\%$) [c.7] Not All Layers Are Equal: A Layer-Wise Adaptive Approach Toward Large-Scale DNN Training Yunyong Ko, Dongwon Lee, and Sang-Wook Kim The ACM Web Conference (WWW 2022) Full Paper (Acceptance Rate $\approx 17.7\%$)	

- [c.6] **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
 The ACM Symposium on Applied Computing (**ACM SAC 2022**)
 Full Paper (Acceptance Rate $\approx 24\%$)
- [c.5] **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
 The IEEE International Conference on Data Mining (**IEEE ICDM 2021**)
 Full Paper (Acceptance Rate $\approx 9.9\%$)
(Selected as One of the Best-ranked Papers of ICDM 2021 for Fast-track Journal Invitation)
- [c.4] **ALADDIN: Asymmetric Centralized Training for Distributed Deep Learning**
Yunyong Ko, Kibong Choi, Hyunseung Jei, Dongwon Lee, and Sang-Wook Kim
 The ACM International Conference on Information and Knowledge Management (**ACM CIKM 2021**)
 Full Paper (Acceptance Rate $\approx 21.7\%$)
(Selected as One of the Spotlight Presentations of CIKM 2021)
- [c.3] **An In-depth Analysis of Distributed Training of Deep Neural Networks**
Yunyong Ko, Kibong Choi, Jiwon Seo, and Sang-Wook Kim
 The IEEE International Parallel & Distributed Processing Symposium (**IEEE IPDPS 2021**)
 Full Paper (Acceptance Rate $\approx 24.5\%$)
- [c.2] **Influence Maximization for Effective Advertisement in Social Networks: Problem, Solution, and Evaluation**
 Suk-Jin Hong, Yunyong Ko, Moon-Jeung Joe, and Sang-Wook Kim
 The ACM Symposium on Applied Computing (**ACM SAC 2019**)
 Full Paper (Acceptance Rate $\approx 24\%$)
- [c.1] **Accurate Path-Based Influence Maximization in Social Networks**
Yunyong Ko, Dong-Kyu Chae, and Sang-Wook Kim
 The ACM Web Conference (**WWW 2016**)
 Short Paper (Acceptance Rate $\approx 21\%$)

Refereed Journal Papers (* indicates equal contributions)

- [j.3] **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)
- [j.2] **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) (Category Top 5%)
- [j.1] **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)

**Awards
& Honors**

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

- 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
- Received the **ACM SIGAPP Student Travel Award** 2019
ACM Symposium on Applied Computing
- Awarded the **Naver Ph.D. Fellowship** 2017
Naver Corporation
- Received the **Best Presentation Award** 2017
Korea Computer Congress

Services

Track Co-Chair

- ACM Symposium on Applied Computing (ACM SAC) 2023

Conference Reviewer

- IEEE International Conference on Data Mining (ICDM) 2022
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (ACM KDD) 2021, 2022
- AAAI International Conference on Artificial Intelligence (AAAI) 2021
- 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, Date: Oct. 2021)

Domestic Patents

- **A Layer-Wise Adaptive Approach toward Large-Scale DNN Training**
Application number: 10-2022-0075800, Date: June. 2022
- **Multi-State Diffusion Model using Interest, Intimacy, and Share Tendency**
Registration number: 10-2332348, Date: Dec. 2020
- **Accurate Ad-Effect Estimation Method based on Relevance between User and Item**
Registration number: 10-2144122, Date: Aug. 2020
- **Influence Maximization in Social Networks: A Hybrid Approach to Solving Performance Issues in Micro and Macro Levels**
Registration number: 10-1810864, Date: Dec. 2017