Yunyong Ko

Contact Information

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Research Interests

Data Mining, Graph Mining, Large-Scale Machine Learning, Social Network Analysis

Education

Hanyang University, Seoul, Korea — Sep. 2013 – Aug. 2021
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 — Mar. 2009 – Aug. 2013
B.S. in Computer Science

Experiences

University of Illionois at Urbana-Champaign, IL, USA — May. 2022 – Present
Postdoctoral Researcher, Department of Computer Science
Project: Large-Scale Hypergraph Mining for Real-World Downstream Applications
Mentor: Prof. Hanghang Tong

Hanyang University, Seoul, Korea — Sep. 2021 – April. 2022
Postdoctoral Researcher, Department of Computer Science
Project: BK21 FOUR Program for Advanced AI Research and Education
Mentor: Prof. Sang-Wook Kim

The Pennsylvania State University, University Park, PA, USA — Oct. 2019 – Feb. 2020
Visiting Researcher, PIKE Research Group
Project: Asymmetric Centralized Training for Distributed Deep Learning
Mentor: Prof. Dongwon Lee

Publications

Preprints (Under review)

[P02] **SAGE: A Storage-Based Approach to Sparse Generalized Matrix-Matrix Multiplication for Large-Scale Real-World Network Analysis**
Myung-Hwan Jang, Yunyong Ko, Hyuck-Moo Gwon, Yongjun Park, and Sang-Wook Kim
The IEEE International Conference on Data Engineering (**IEEE ICDE 2022**)

[P01] **RealGraph$^{\mathbf{GPU}}$: 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 (**CIKM 2022**)

Refereed Conference Papers (* indicates equal contributions)

[C07] **Not All Layers Are Equal: A Layer-Wise Adaptive Approach Toward Large-Scale DNN Training**
Yunyong Ko, Dongwon Lee, Sang-Wook Kim
The ACM Web Conference (**WWW 2022**)
Full Paper (Acceptance Rate ≈ 17.7%)

[C06] **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, Sang-Wook Kim
The ACM Symposium on Applied Computing (**ACM SAC 2022**)
Full Paper (Acceptance Rate ≈ 24%)

[C05] **MASCOT: A Quantization Framework for Efficient Matrix Factorization in Recommender Systems**
Yunyong Ko*, Jae-Seo Yu*, Hong-Kyun Bae, Yongjun Park, Dongwon Lee, Sang-Wook Kim
The IEEE International Conference on Data Mining (**IEEE ICDM 2021**)
Full Paper (Acceptance Rate ≈ 9.9%)
(*Selected as One of the Best-ranked Papers of ICDM 2021 for Fast-track Journal Invitation*)

[C04] **ALADDIN: Asymmetric Centralized Training for Distributed Deep Learning**
Yunyong Ko, Kibong Choi, Hyunseung Jei, Dongwon Lee, Sang-Wook Kim
The ACM International Conference on Information and Knowledge Management (**CIKM 2021**)
Full Paper (Acceptance Rate ≈ 21.7%)
(*Selected as One of the Spotlight Presentations of CIKM 2021*)

[C03] **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 ≈ 24.5%)

[C02] **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 ≈ 24%)

[C01] **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 ≈ 21%)

Refereed Journal Papers (* indicates equal contributions)

[J03] **A Novel Update Strategies for Asymmetric Centralized Training in Heterogeneous Environments**
Yunyong Ko, and Sang-Wook Kim
Applied Sciences (SCIE Journal, 2022) (Impact Factor: 2.68)

[J02] **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) (Impact Factor: 5.91, Category Top 5%)

[J01] **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) (Impact Factor: 3.282)

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 **Best 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 Symposim on Applied Computing (ACM SAC) 2022 - 2023

Program Committee Member
ACM Symposim on Applied Computing (ACM SAC) 2021 - 2023

External Reviewer
IEEE International Conference on Data Mining (ICDM) 2022
ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD) 2022
AAAI International Conference on Artificial Intelligence (AAAI) 2021
ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD) 2021

Patents

Asymmetric Centralized training for Distributed Deep Learning (PCT application)
(Application number: 10-2020-0174036, Date: Dec. 2021)

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)