

JAEMIN YOO

Postdoctoral Research Fellow @ Carnegie Mellon University

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BIOGRAPHY

I am a postdoctoral research fellow in the Heinz College of Information Systems and Public Policy at Carnegie Mellon University. I received my Ph.D. and B.S. in Computer Science and Engineering from Seoul National University. My research areas include data mining and machine learning on graphs, multivariate time series forecasting, and interpretable machine learning. I have published more than 10 first-author papers in major data mining and machine learning venues including KDD, WSDM, TheWebConf, and NeurIPS. I am a recipient of the Google PhD Fellowship, Qualcomm Innovation Fellowship, and the Outstanding Dissertation Award from Seoul National University.

POSITIONS

Carnegie Mellon University, Pittsburgh, PA, USA *Mar. 2022 - Present*
Postdoctoral Research Fellow, Heinz College of Information Systems and Public Policy
Advisor: *Prof. Leman Akoglu*

EDUCATION

Seoul National University, Seoul, South Korea *Mar. 2016 - Feb. 2022*
Ph.D. in Computer Science and Engineering
Advisor: *Prof. U Kang*
Thesis: *Probabilistic Approaches for Node and Graph Classification*

Seoul National University, Seoul, South Korea *Mar. 2012 - Feb. 2016*
B.S. in Computer Science and Engineering

AWARDS & HONORS

S-Oil Outstanding Dissertation Award	<i>Dec. 2022</i>
SNU CSE Outstanding Dissertation Award	<i>Feb. 2022</i>
One of the Best-Ranked Papers of ICDM 2021	<i>Dec. 2021</i>
SNU BK21 Outstanding Graduate Student Award	<i>Jul. 2021</i>
SIAM Student Travel Award (SDM 2021)	<i>Apr. 2021</i>
SNU BK21 Star Researcher Award	<i>Feb. 2021</i>
Qualcomm Innovation Fellowship	<i>Dec. 2020</i>
Yulchon AI Star Award	<i>Sep. 2020</i>
Google PhD Fellowship (Machine Learning)	<i>Sep. 2019</i>
Samsung HumanTech Paper Award (Honorable Mention)	<i>Feb. 2019</i>
Google Conference Scholarship (ICDM 2017)	<i>Nov. 2017</i>

PREPRINTS

- [i3] UltraProp: Principled and Explainable Propagation on Large Graphs
Meng-Chieh Lee, Shubhanshu Shekhar, [Jaemin Yoo](#), and Christos Faloutsos
arXiv Preprint (2023)
- [i2] SlenderGNN: Accurate, Robust, and Interpretable GNN, and the Reasons for its Success
[Jaemin Yoo](#)*, Meng-Chieh Lee*, Shubhanshu Shekhar, and Christos Faloutsos
arXiv Preprint (2022; *equal contribution)
- [i1] Self-supervision is not magic: Understanding Data Augmentation in Image Anomaly Detection
[Jaemin Yoo](#), Tiancheng Zhao, and Leman Akoglu
arXiv Preprint (2022)

TUTORIALS

- [t2] Mining of Real-world Hypergraphs: Concepts, Patterns, and Generators
Geon Lee, [Jaemin Yoo](#), and Kijung Shin
TheWebConf 2023
- [t1] Mining of Real-world Hypergraphs: Concepts, Patterns, and Generators
Geon Lee, [Jaemin Yoo](#), and Kijung Shin
ICDM 2022 and **CIKM 2022**

CONFERENCES

- [c16] Accurate Stock Movement Prediction with Self-supervised Learning from Sparse Noisy Tweets
Yejun Soun*, [Jaemin Yoo](#)*, Minyoung Cho, Jihyeong Jeon, and U Kang
BigData 2022 (acceptance rate $122/633 = 19.2\%$; *equal contribution)
- [c15] Reciprocity in Directed Hypergraphs: Measures, Findings, and Generators
Sunwoo Kim, Minyoung Choe, [Jaemin Yoo](#), and Kijung Shin
ICDM 2022 (acceptance rate $174/890 = 19.6\%$)
- [c14] Accurate Node Feature Estimation with Structured Variational Graph Autoencoder
[Jaemin Yoo](#), Hyunsik Jeon, Jinhong Jung, and U Kang
KDD 2022 (acceptance rate $254/1695 = 15.0\%$)
- [c13] Model-Agnostic Augmentation for Accurate Graph Classification
[Jaemin Yoo](#), Sooyeon Shim, and U Kang
TheWebConf 2022 (acceptance rate $323/1822 = 17.7\%$)
- [c12] MiDaS: Representative Sampling from Real-world Hypergraphs
Minyoung Choe, [Jaemin Yoo](#), Geon Lee, Woonsung Baek, U Kang, and Kijung Shin
TheWebConf 2022 (acceptance rate $323/1822 = 17.7\%$)
- [c11] Transition Matrix Representation of Trees with Transposed Convolutions
[Jaemin Yoo](#) and Lee Sael
SDM 2022 (acceptance rate $83/298 = 27.8\%$)
- [c10] Accurate Graph-Based PU Learning without Class Prior
[Jaemin Yoo](#)*, Junghun Kim*, Hoyoung Yoon*, Geonsoo Kim, Changwon Jang, and U Kang
ICDM 2021 (regular paper; top $98/990 = 9.9\%$; *equal contribution)
Selected as one of the best-ranked papers of ICDM 2021 for fast-track journal invitation

- [c9] Accurate Multivariate Stock Movement Prediction via Data-Axis Transformer with Multi-Level Contexts
Jaemin Yoo, Yejun Soun, Yong-chan Park, and U Kang
KDD 2021 (acceptance rate $238/1541 = 15.4\%$)
- [c8] Gaussian Soft Decision Trees for Interpretable Feature-Based Classification
Jaemin Yoo and Lee Sael
PAKDD 2021 (acceptance rate $157/768 = 20.4\%$)
- [c7] Attention-Based Autoregression for Accurate and Efficient Multivariate Time Series Forecasting
Jaemin Yoo and U Kang
SDM 2021 (acceptance rate $85/400 = 21.3\%$)
- [c6] Sampling Subgraphs with Guaranteed Treewidth for Accurate and Efficient Graphical Inference
Jaemin Yoo, U Kang, Mauro Scanagatta, Giorgio Corani, and Marco Zaffalon
WSDM 2020 (acceptance rate $91/615 = 14.8\%$)
- [c5] Knowledge Extraction with No Observable Data
Jaemin Yoo, Minyong Cho, Taebum Kim, and U Kang
NeurIPS 2019 (acceptance rate $1428/6743 = 21.2\%$)
- [c4] EDiT: Interpreting Ensemble Models via Compact Soft Decision Trees
Jaemin Yoo and Lee Sael
ICDM 2019 (acceptance rate $194/1046 = 18.5\%$)
- [c3] Belief Propagation Network for Hard Inductive Semi-Supervised Learning
Jaemin Yoo, Hyunsik Jeon, and U Kang
IJCAI 2019 (acceptance rate $850/4752 = 17.9\%$)
- [c2] Fast and Scalable Distributed Loopy Belief Propagation on Real-World Graphs
Saehan Jo, Jaemin Yoo, and U Kang
WSDM 2018 (acceptance rate $83/514 = 16.3\%$)
- [c1] Supervised Belief Propagation: Scalable Supervised Inference on Attributed Networks
Jaemin Yoo, Saehan Jo, and U Kang
ICDM 2017 (regular paper; top $72/778 = 9.3\%$)

JOURNALS

- [j3] Graph-based PU Learning for Binary and Multiclass Classification without Class Prior
Jaemin Yoo*, Junghun Kim*, Hoyoung Yoon*, Geonsoo Kim, Changwon Jang, and U Kang
Knowledge and Information Systems (SCIE Journal, 2022; *equal contribution)
- [j2] Signed Random Walk Diffusion for Effective Representation Learning in Signed Graphs
Jinhong Jung, Jaemin Yoo, and U Kang
PLOS ONE (SCIE Journal, 2022)
- [j1] Efficient Learning of Bounded-Treewidth Bayesian Networks from Complete and Incomplete Data Sets
Mauro Scanagatta, Giorgio Corani, Marco Zaffalon, Jaemin Yoo, and U Kang
International Journal of Approximate Reasoning (SCIE Journal, 2018)

INVITED TALKS

SNU AI Summer School 2022, Online	<i>Aug. 2022</i>
SK C&C, Online	<i>Aug. 2022</i>
KAIST School of Computing, Online	<i>Jul. 2022</i>
AWS Deep Learning Group, Online	<i>Jul. 2022</i>
EIRIC Seminar, Online	<i>Apr. 2022</i>
KAIST School of Electrical Engineering, Daejeon, South Korea	<i>Feb. 2022</i>
LG AI Research Tech Talk, Seoul, South Korea	<i>Feb. 2022</i>
KAIST AI Student Colloquium, Online	<i>Oct. 2021</i>
SNU AI Summer School 2021, Online	<i>Aug. 2021</i>
SNU AI Institute (AIIS) Retreat 2021, Seoul, South Korea	<i>Apr. 2021</i>
NAVER Online Tech Talk, Online	<i>Dec. 2020</i>
SNU AI Summer School 2020, Seoul, South Korea	<i>Aug. 2020</i>
SNU Hospital, Seoul, South Korea	<i>Jul. 2020</i>
SNU AI Institute (AIIS) Retreat 2020, Seoul, South Korea	<i>Jun. 2020</i>
Kakao Enterprise, Seongnam, South Korea	<i>Jan. 2020</i>
Korea Software Congress (KSC) 2019, Pyeongchang, South Korea	<i>Dec. 2019</i>
SNU Center for AI (SCAI) Retreat 2019, Chuncheon	<i>Jul. 2019</i>
Samsung Electronics, Suwon, South Korea	<i>Mar. 2019</i>
IDSIA, Lugano, Switzerland	<i>Jul. 2018</i>
Korea Software Congress 2017, Busan, South Korea	<i>Dec. 2017</i>

TEACHING EXPERIENCE

Teaching Assistant

- TA @ Mathematics for Machine Learning, LG Chem *Dec. 2021 - Jan. 2022*
- TA @ Hyundai AI Master, Hyundai Motors *Aug. 2021 - Oct. 2022*
- TA @ Samsung DS² (Deep Learning), Samsung Electronics *Apr. 2018 - Feb. 2019*
- TA @ Deep Learning, SNU Fourth Industrial Revolution Academy . . . *Oct. 2017 - Dec. 2018*
- TA @ Distributed Computing, SNU Big Data Academy *Feb. 2017 - Dec. 2017*
- TA @ Distributed Computing, SNU Big Camp *Aug. 2016 - Feb. 2017*
- TA @ Large Data Analysis (M1522.000900-002), SNU *Fall 2017*
- TA @ Introduction to Data Mining (M1522.001400-001), SNU *Spring 2017*
- TA @ Data Structures (M1522.001600-002), SNU *Fall 2016*

Mentoring/Tutoring

- Student Mentor @ Undergraduate Research Program, SNU *Feb. 2020 - Jun. 2020*
- Project Mentor @ DL-based Demand Forecasting, LG Electronics . . . *Mar. 2020 - May 2020*
- Writing Tutor @ Writing in Scientific and Technology (031.004-{002, 020}), SNU . . *Fall 2015*
- Writing Tutor @ Writing in Scientific and Technology (031.004.028), SNU . . . *Spring 2015*
- Writing Tutor @ Writing in Scientific and Technology (031.004-{002, 023}), SNU . . *Fall 2014*

RESEARCH PROJECTS

(SW Star Lab) Flexible and Efficient Compression of Neural Networks *Apr. 2020 - Feb. 2022*
Malicious User Detection with Relational Information (w/ NCSoft) *Sep. 2020 - Feb. 2021*
Personalized Recommendation of Items in E-commerce (w/ Wemakeprice) . . *Mar. 2019 - Dec. 2019*
Content Recommendation based on Watch History (w/ SK Telecom) *Mar. 2018 - Nov. 2018*
Research on Statistical Learning and Inference with PGMs (w/ IDSIA) . . . *Mar. 2016 - Oct. 2018*
Temporal Stock Price Prediction (w/ eMoney) *Aug. 2016 - May 2017*
Development of Distributed ML Library for Industry (w/ SK Telecom) . . . *Mar. 2016 - Dec. 2016*

PATENTS

Registered

- Jaemin Yoo and U Kang, “Apparatus and Method for Classifying Nodes”, KR-Registration No. 10-1924832 (2018)
- Taebum Kim, Jaemin Yoo, and U Kang, “Method for Compressing Deep Learning Neural Networks and Apparatus for Performing the Same”, KR-Registration No. 10-2199285 (2020)
- Jaemin Yoo and U Kang, “Method for Extracting Knowledge from Artificial Neural Network and Apparatus for Performing the Same”, KR-Registration No. 10-2345262 (2021)

Filed

- Jaemin Yoo, Sooyeon Shim, and U Kang, “Apparatus and Method for Data Augmentation”, KR-Application No. 10-2021-0169909 (2021)
- Jaemin Yoo, Hyunsik Jeon, Jinhong Jung, and U Kang, “Apparatus and Method for Predicting Feature of Node”, KR-Application No. 10-2021-0172385 (2021)

PROFESSIONAL SERVICES

Session Chair

- KDD (ACM SIGKDD Conference on Knowledge Discovery and Data Mining) 2022

Program Committee Member

- KDD (ACM SIGKDD Conference on Knowledge Discovery and Data Mining) . . . 2021 - 2023
- AAAI (AAAI Conference on Artificial Intelligence) 2021 - 2023
- BigComp (IEEE International Conference on Big Data and Smart Computing) . . . 2021 - 2023
- SDM (SIAM International Conference on Data Mining) 2022

Conference Reviewer

- ICLR (The International Conference on Learning Representations) 2023
- LoG (The Learning on Graphs Conference) 2022

Journal Reviewer

- Data Mining and Knowledge Discovery 2022
- Pattern Recognition 2021 - 2022

External Conference Reviewer

- ICLR (The International Conference on Learning Representations) 2021 - 2022
- NeurIPS (Conference on Neural Information Processing Systems) 2020 - 2021
- TheWebConf (The Web Conference) 2018 - 2021
- KDD (ACM SIGKDD Conference on Knowledge Discovery and Data Mining) . . 2018 - 2020
- BigComp (IEEE International Conference on Big Data and Smart Computing) . . 2017 - 2020
- CIKM (ACM Intl. Conference on Information and Knowledge Management) . . . 2017 - 2019
- WSDM (ACM International Conference on Web Search and Data Mining) 2019
- ICDM (IEEE International Conference on Data Mining) 2018
- SAC (ACM/SIGAPP Symposium on Applied Computing) 2018